ESPRS Guidelines

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Guidelines
For surgical practice of rhinoplasty

These guidelines are concerned with perioperative management of a case of rhinoplasty and not guidelines for the operative procedure itself.

Definition: Rhinoplasty is a surgical procedure that alters or modifies the shape of the nose with preserving or enhancing the nasal airway.

The target patient population is patients aged 15 years or more (it should be noted that rhinoplasty is better recommended for patient 18 years and more but with major deformities it may be considered for patients as young as 15 years).

Guidelines:

1. All rhinoplasty patients should be asked for their motivation and whether their expectations are realistic. Patients should be seeking rhinoplasty to correct a deformity to improve their own appearance to satisfy their own self. The motivation shouldn't be to satisfy a partner or to get a job. These motivations & expectation should be documented in the medical record.
2. Rhinoplasty patient should be assessed for comorbidity that may affect the outcome of the procedure. These should include the following:
    a. History of systemic diseases such as diabetes, hypertenstion, liver disease or a disease that requires prolonged use of corticosteroids.
    b. History of use of anticoagulants. These drugs should be stopped before rhinoplasty after consultation with the treating physician.
    c. History of prolonged use of vasoconstrictive nasal spray or drops. Rhinoplasty in that patient is followed by rebound congestion of nasal mucosa and bleeding. These drugs should be gradually stopped before surgery.
    d. History of obstructive sleep apnea. This is not contraindication to do rhinoplasty but needs a special post-operative management. A survey questions to detect such a possible condition is available (appendix 1).
    e. Assessment to exclude the possibility that the patient is suffering from body dysmorphic disorder. This condition is more likely in male older than 30 with unrealistic expectations and unsatisfied with a previous successful surgery. Rhinoplasty is contraindicated in patient with this condition.
3. The rihnoplasty patient should be assessed for nasal airway obstruction. Deviated septum or hypertrophied turbinate should be documented. CT face and skull or a posterior rhinoscopy may be ordered.
4. The surgeon should educate the patient the result he or she should expect after surer. He should also discuss possible complications and the possibility of a revision surgery. This discussion is conducted before asking the patient to sign consent. The use of photo morphing is an option but is should be stressed that the result of photo morphing is not exactly what the patient expects after surgery. No document of photo morphing should be given to the patient. The patient should be informed and educated about the possible scars in the columellar, post auricular and possibly a chest scare if there was a need to harvest a rib cartilage graft.

5. The surgeon should inform and educate the patient about the postoperative period as regards the following:
    a. Post-operative pain, ecchymosis and periorbital oedema. Intra operative use of loval anaesethia may be used to decrease immediate post-operative pain. Cold compresses and analgesics are prescribed.
    b. Possible use of a dose of dexamethasone to decrease oedema.
    c. Possible minor nasal bleeding.
    d. The duration of applying a nasal support.
    e. Possible use of nasal pack.
    f. Use of antibiotics and other medications. American guidelines doesn't encourage use of antibiotics and if used limit it to 24 hours.
    g. Sleep position in semi siting
    h. Avoiding contact sport for at least 8 weeks.
6. The patient should consent for pre-operative photos of the face in front, profile and semi profile views in addition to a nasal view.
7. The patient should be educated that the final evaluation of the aesthetic and functional outcome is twelve months after surgery.

Appendix 1: Stop –bang sleep apnea Questionnaire:

Snoring: Do you snore loudly to be heard across closed doors or your bed partner elbows you for snoring at night.

☐ YES ☐ NO

Tired: Do you feel tired fatigued or sleepy during the day time (such as falling asleep during driving)

☐ YES ☐ NO

Observed: Has any one observed you stop breathing or choking\gasping during your sleep.

☐ YES ☐ NO

Pressure: Do you have or being treated for high blood pressure.

☐ YES ☐ NO

Body mass index more than 35.

☐ YES ☐ NO

Age older than 50 year old.

☐ YES ☐ NO

Neck size large (Measured Around Adams Apple).
For males collar 43 cm or larger.
For females collar 41 cm or larger.

☐ YES ☐ NO

Gender = male

☐ YES ☐ NO

Low risk : yes to 2 questions.

Moderate : yes to 3 to 4 questions.

High risk yes to 5 to 8 questions.

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقة الخطية المستنيرة على عملية جراحية (تجميل أنف – تعديل حاجز أنفي – إصلاح عيب خلقي بالأنف
(Septoplasty- Rhinoplasty

المريض:
أقر أنا الموقع أدناه أنني موافق على إجراء التداخل الجراحي المبين عاليه، وأقر أن الطبيب قد قام بشرح طبيعة ذلك التداخل الجراحي والهدف منه، كما أوضح البدائل المتاحة لهذا الإجراء الجراحي. كما أقر أنني على كامل المعرفة بالمضاعفات الطبية والجراحية ممكنة الحدوث من جرّاء تلك العملية.

❖ **معلومات عامه:**

1. جراحة الأنف)عملية تجميل الأنف (هي عملية يتم إجراؤها بشكل متكرر من قبل جراحي التجميل .يمكن لهذه الجراحة أن تؤدي إلى تغييرات في شكل الأنف وبنيته ووظيفته . يمكن أن يقلل مقدمة الأنف أو زيادة حجم الأنف، أو تغيير شكل الأنف، أو تضييق عرض فتحات الأنف، أو تغيير الزاوية بين الأنف والشفة العلوية .يمكن أن تساعد هذه العملية على تصحيح العيوب الخلقية وإصابات الأنف والمساعدة في تخفيف بعض مشاكل التنفس.
2. لا يوجد نوع عام من جراحة تجميل الأنف التي تلبي احتياجات كل مريض .جراحة تجميل الأنف مخصص لكل مريض، اعتمادًا على احتياجاته .يمكن عمل الجروح داخل الأنف أو يمكن ان تخفى في أماكن غير واضحة من الأنف في عملية تجميل الأنف المفتوحة .في بعض الحالات، وفى عدم وجود غضاريف كافية بالأنف انه قد يضطر الى اخذ رقعة من غضاريف الأذن او الضلوع للمساعدة في إعادة تشكيل هيكل الأنف .يمكن إجراء جراحة الأنف الداخلية لتحسين التنفس الأنفي في وقت تجميل الأنف.
3. ضرورة الاحتفاظ بالدعامات الخارجية والداخلية للأنف لمدة اسبوعين من تاريخ الجراحة والمحافظة على الانف من التعرض لأي اصابة في خلال فترة النقاهة.
4. حدوث تورم بالوجه وازرقاق تحت العينين في فترة ما بعد الجراحة والتي قد تمتد لأكثر من أسبوعين.
5. أفضل المرشحين لهذا النوع من الجراحة هم الأفراد الذين يبحثون عن التحسن وليس الكمال في ظهور أنفهم .بالإضافة إلى التوقعات الواقعية، فإن الصحة الجيدة والاستقرار النفسي هي صفات مهمة لمريض يفكر في جراحة تجميل الأنف .يُمكن إجراء عملية تجميل الأنف بالتزامن مع جراحات أخرى.
6. تم الشرح والتوضيح التام ان النتيجة النهائية لعمليات تجميل الأنف لا تتم الا بعد مرور سنة من تاريخ الجراحة. وفى حالة الحاجة لأي تدخل اخر بالأنف لا يمكن القيام به قبل مرور سنه من تاريخ اجراء الجراحة.

بدائل علاجيه:من عدم الخضوع لجراحة تجميل الأنف .بعض الجراحات الأنفية الداخلية، قد لا تتطلب جراحة على الجزء الخارجي من الأنف .يمكن معالجة بعض مشاكل محيط الأنف عن طريق الحقن المؤقت بالفيللر. أيضا يوجد مضاعفات للعلاجات البديلة.

❖ **مضاعفات خاصة بذلك الإجراء الجراحي:**

1. قد يحدث تأثر بالتنفس او صعوبة بالتنفس
2. ندبات في أماكن اخري كالأذن والصدر نتيجة اخذ رُقعه الغضاريف.
3. ثقب بالحاجز الانفي، قد يحتاج الي علاج إضافي.
4. كذلك تغير بالإحساس موضع الجراحة.
5. عدم انتظام سطح وشكل ولون الجلد موضع الجراحة
6. نزيف شديد تحت الجلد مما قد يؤثر على سلامة وحيوية الجلد.
7. تكدم وتورم بالأنف بالوجه عقب الجراحة.
8. قد يحدث اعوجاج بالانف او عدم تماثل بين فتحتى الانف.
9. من الجائز الشعور بعدم الرضا من الشكل النهائي عقب الجراحة.
10. على الرغم من توقع نتائج جيدة، لا يوجد ضمان أو ضمان صريح أو ضمني، على النتائج التي يمكن الحصول عليها.
11. حدوث حساسية من أي من مكونات المواد المستخدمة في الجراحة.

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقة الخطية المستنيرة على عملية جراحية (تجميل أنف – تعديل حاجز أنفي – إصلاح عيب خلقي بالأنف
(Septoplasty– Rhinoplasty

المقر بما فيه (الاسم ثلاثى): ..... ☐ذكر ☐ انثى السن : .....

الصـفـة : ☐المريض ☐ ولى الامر ☐ قريب ☐ أخرى .....

في حالة عدم توقيع المريض السبب ☐ قاصر ☐ قصور ذهنى ☐ غائب عن الوعى ☐ أخرى .....

التوقيع : ..... التاريخ : ..... الوقت : ..... رقم تحقيق الشخصية: .....

❖ نوع التخدير المستخدم اثنـاء الجراحة ☐ تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ

الطبيب المعالج:

- ❖ أقر بانني قد قمت بشرح طبيعة الإجراء الجراحي المقرر للمريض والبدائل العلاجية له والمضاعفات الوارد حدوثها، كما أعطيت له الفرصة لطرح كافة الأسئلة المتعلقة بذلك الإجراء وقمت بالإجابة عليها.
- ❖ كما أقر أن العملية الجراحية عالية تهدف إلى علاج المريض عن طريق اجراء عملية جراحية تجميلية لتجميل الانف.
- ❖ كما أقر أنني قد قمت باتخاذ كافة الاحتياطات والفحوصات الطبية المعمول بها قبل إجراء هذا التداخل الجراحي من تحاليل طبية وأشعات مع إلزامي الكامل بمتابعة المريض بعد إجراء الجراحة وحتى تمام الشفاء.

المقر بما فيه:

الطبيب المعالج (الاسم الثلاثي): ..... التوقيع: ..... القسم التابع له: ..... التاريخ: ..... الوقت: .....

❖ الشاهد/ المترجم على توقيع المريض

الاسم : ..... التوقيع: ..... التاريخ: ..... الوقت: ..... الرقم القومى: .....

ملاحظات هامـــة:

- لا يسمح بإجراء أي تعديلات علي هذا النموذج بعد الانتهاء من تعبئته وإنما يستبدل بنموذج آخر جديد.
- يحتفظ المريض أو من ينوب عنه بنسخة من هذا الإقراروبعتبر سارى لمدة اسبوع من تاريخ توقيع المريض

رقم تذكرة المريض .....

Guidelines
For aesthetic surgery of the chin
(Genioplasty)

Definition: Genioplasty is an aesthetic procedure either to augment the chin (augmentation geniopalsty) or reduce an oversized\over projecting chin (reduction genioplasty). This procedure is done in patients with normal occlusion. This procedure is different than orghognathic surgery that modifies the shape of the chin as part of correcting malocclusion.

Target population: patients aged 18 years and above to guarantee full dentation and full development of facial skeleton.

Guidelines:

1. All patients asking for genioplasty should be asked for their motivation and whether their expectations of surgery are realistic. They should be seeking surgery to improve their appearance not to satisfy a partner of to apply for a job. Genioplasty may be performed with rhinoplasty or face lift (profiloplasty).
2. Patients should be evaluated as regards:
    a. Proportions of the face and the relation of lower third to middle third and upper third of the face and to be documented.
    b. Condition of teeth and the occlusion. Occlusion should be normal and any caries or bad oral hygiene should be treated before surgery.
    c. Cepholmetry may be needed to help estimating the degree of change needed.
    d. Compliance of soft tissue of the lip is estimated and the naso-mental folds as their appearance may be affected by genioplasty.
    e. Panoramic x ray is needed especially in old patients to evaluate thickness of bone especially in cases of reduction genioplasty.
    f. Face photos front, semi-profile and full profile views are taken.
3. The patient should be educated as regards the type of incision whether intraoral or external at the lower chin crease.
4. The patient should be educated as regards possible complications and the nature of the implant to be used before signing the consent for this procedure.
5. The patient should be educated as regards the following post-operative management:
    a. Pain management.
    b. Proper oral hygiene by frequent mouth washes especially after meals.
    c. Avoid too solid meals for two weeks.
    d. Avoid contact sports for eight weeks.
6. The operative result is evaluated after three months.

الموافقة الخطية المستنيرة على جراحة إعادة تشكيل الذقن -تكبير الذقن
Chin surgery- Mentoplasty- Implant- Augmentation

المريض:

أقر أنا الموقعة أدناه أنني موافقة على إجراء التداخل الجراحي المبين عاليه، وأقر أن الطبيب قد قام بشرح طبيعة ذلك التداخل الجراحي والهدف منه، كما أوضح البدائل المتاحة لهذا الإجراء الجراحي. كما أقر أنني على كامل المعرفة بالمضاعفات الطبية والجراحية ممكنة الحدوث من جرّاء تلك العملية.

❖ **معلومات عامه:**

1. جراحة الذقن، أو تشكيلة، أو جراحة تكبير الذقن هي عملية جراحية لإعادة تشكيل الذقن إما عن طريق التحسين باستخدام جراحة زرع الحشوات أو تصغير على العظام .في بعض الأحيان يمكن تحريك عظم الفك نفسه إلى الأمام، بدلاً من ذلك، يمكن استخدام حشوات او غرسة السيليكون لإعطاء المزيد من البروز للذقن .على العكس، يمكن إزالة العظم لتقليل الذقن الزائدة .علاوة على ذلك، يمكن التوصية بتعديلات على الفك العلوي و / أو السفلي لتحسين ديناميكيات المضغ -أو كيف تتناسب الأسنان معًا .يمكن أن تتراوح هذه العمليات من بسيطة إلى معقدة للغاية.
2. لقد شرح لي الطبيب كافة الخطوات من الفتح الجراحي والخيوط الجراحية وخطوات الجراحة. كما أنني اتعهد بالالتزام بتوصيات الطبيب من ضرورة لبس المشد الضاغط المناسب فترة لا تقل عن شهر من تاريخ الجراحة. وفى حالة إخلالي بمتابعة اوامر الطبيب فأن الطبيب والفريق الطبي المساعد له غير مسئولين عن نتيجة الجراحة.
3. تتم هذه الجراحة من خلال جرح خارجي أسفل الذقن عادة ويترك ندبه، تتحسن أثارها مع الوقت ولكن لا تختفي نهائيا.
4. اي مشكلة تتعلق بتصنيع الجهاز او الحشوة هو مسئولية الشركة المصنعة وليس الطبيب.
5. قد تكون هناك حاجة جراحات ثانوية أخري مستقبلية مع تقدم في السن ومن الصعب التنبؤ بالنتائج المستديمة.
6. أفضل المرشحين لهذا النوع من الجراحة هم الأفراد الذين يبحثون عن التحسين، وليس الكمال، في مظهر وجوههم .بالإضافة إلى توقعات واقعية وصحة جيدة . الاستقرار النفسي صفات مهمة للمريض الذي يفكر في جراحة الذقن .يمكن أن تكون جراحة الذقن بالاقتران مع العمليات الجراحية الأخرى.

❖ **مضاعفات خاصة بذلك الإجراء الجراحي:**

1. نزيف موضع الجراحة، يتطلب تدخل أخر.
2. عدم انتظام سطح وشكل ولون الجلد موضع الجراحة، وعدم تماثل شكل الوجه.
3. قد تطرأ بعض المضاعفات الطبية والجراحية التي تستلزم إزالة حشوات السيليكون أو استبدالها.
4. تغير بالإحساس موضع الجراحة.
5. قد يحدث النزوح أو الدوران أو الهجرة للحشوة من موضعها الأولي ويمكن أن يصاحبه تشوه في الشكل ويحتاج الي تدخل جراحي أخر.
6. عدم التئام الجرح بالجلد موضع الجراحة مما قد يتطلب جراحة أخرى.
7. من الجائز الشعور بعدم الرضا من الشكل النهائي عقب الجراحة.
8. مشاكل التئام الجروح: بعض الحالات الطبية والمكملات الغذائية والأدوية قد تؤخر وتتداخل مع الالتئام. المدخنون أكثر عرضة لخطر فقدان الجلد ومضاعفات التئام الجروح.
9. الندبات: جميع العمليات تترك ندبات، بعضها أكثر وضوحا من البعض الآخر. على الرغم من التئام الجروح بشكل جيد بعد الجراحة، قد تحدث ندوب غير طبيعية داخل الجلد والأنسجة العميقة.
10. مصل الدم: نادرًا ما يتراكم السوائل بين الجلد والأنسجة الكامنة بعد الجراحة. في حالة حدوث هذه المشكلة، قد تتطلب إجراءات إضافية لتصريف السوائل.

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقة الخطية المستنيرة على جراحة إعادة تشكيل الذقن -تكبير الذقن
Chin surgery- Mammoplasty- Implant- Augmentation

بدائل علاجيه: هناك طرق بديلة أخرى، وتشمل هذه البدائل عدم القيام بأي شيء، أو استخدام الفيللر او حقن الدهون. ترتبط المخاطر والمضاعفات المحتملة أيضًا بالأشكال الجراحية البديلة للعلاج.

المقر بما فيه (الاسم ثلاثى): ..... ☐ ذكر ☐ انثى السن : .....

الصفة : ☐ المريض ☐ ولى الامر ☐ قريب ☐ أخرى .....

في حالة عدم توقيع المريض السبب ☐ قاصر ☐ قصور ذهنى ☐ غائب عن الوعى ☐ أخرى .....

التوقيع : ..... التاريخ : ..... الوقت : ..... رقم تحقيق الشخصية: .....

❖ **نوع التخدير المستخدم اثنـاء الجراحة** ☐ تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ

الطبيب المعالج:

❖ أقر بأنني قد قمت بشرح طبيعة الإجراء الجراحي المقرر للمريضة والبدائل العلاجية لها والمضاعفات الوارد حدوثها، كما أعطيت لها الفرصة لطرح كافة الأسئلة المتعلقة بذلك الإجراء وقمت بالإجابة عليها.

❖ كما أقر أن العملية الجراحية عالية تهدف إلى علاج المريضة عن طريق اجراء عملية جراحية تجميلية للذقن او تشكيلة.

❖ كما أقر أنني قد قمت باتخاذ كافة الاحتياطات والفحوصات الطبية المعمول بها قبل إجراء هذا التداخل الجراحي من تحاليل طبية وأشعات مع التزامي الكامل بمتابعة المريضة بعد إجراء الجراحة وحتى تمام الشفاء.

المقر بما فيه:

الطبيب المعالج (الاسم الثلاثي): ..... التوقيع: ..... القسم التابع له: ..... التاريخ: ..... الوقت: .....

❖ **الشاهد/ المترجم على توقيع المريض**

الاسم : ..... التوقيع: ..... التاريخ: ..... الوقت: ..... الرقم القومى: .....

ملاحظات هامـــة:

- لا يسمح بإجراء أي تعديلات علي هذا النموذج بعد الانتهاء من تعبئته وإنما يستبدل بنموذج آخر جديد.
- يحتفظ المريض أو من ينوب عنه بنسخة من هذا الإقرار.

رقم تذكرة المريض .....

النموذج المعتمد من الجمعية المصرية لجراحى التجميل والاصلاح

General Guidelines For Aesthetic Surgery

1. All aesthetic plastic surgery procedures should be done by an officially certified well trained plastic surgeon who is a member of the Egyptian Society of plastic surgeons.
2. Patients should be educated about the relevant consent prepared by the Egyptian Society of plastic surgeons and sign it before surgery.
3. All procedures should be performed in a certified medical facility fulfilling the patient safety requirement as issued by the Egyptian ministry of health.
4. Though aesthetic surgery procedures are satisfactory to most of the patients still it should be stated that full patient satisfaction is not guaranteed.

نموذج الموافقة الخطية المستنيرة على الخيوط التجميلية
(Facial Threads)

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

المريض:

1. بصفتك جزء من العملية الطبية ومشارك في اتخاذ القرار الطبي تم تصميم هذا الاقرار للتأكد من المامك التام المستنير بالإجراءات الطبية المتبعة وانه قد تمت الاجابة على كل تساؤلاتك واستفساراتك بواسطة الطبيب المعالج.
2. اعطى بموجب هذا الاذن الى الطبيب: ..... ومساعديه لعمل التدخل الجراحى لجراحى.....
3. لقد شرح لي الطبيب كافة الخطوات من الفتح الجراحي والخيوط الجراحية وخطوات الجراحة. كما أنني اتعهد بالالتزام بتوصيات الطبيب من ضرورة المحافظة على الوجه من التعابير المفاجئة او التدليك. وفى حالة إخلالي بمتابعة اوامر الطبيب فأن الطبيب والفريق الطبي المساعد له غير مسئولين عن نتيجة الخيوط.
4. اتفهم تماما احتمال حدوث تورم او ازرقاق في فترة ما بعد الجراحة والتي قد تمتد لأكثر من ثلاثة اسابيع.
5. لقد أبلغني طبيبي بأنني سأتلقى التخدير الموضعي. وأفهم أن هناك مخاطر وآثارا جانبية مقترنة بالتخدير والمهدئات.
6. عاده ما يكون هناك كشكشه عند منطقه دخول الخيوط تختفى فى خلال ايام.
7. تم الشرح والتوضيح التام ان النتيجة النهائية لعمليات شد الوجه بالخيوط لا تتم الا بصورة تدريجية ابتداء من الاسبوع الثاني وحتى 3-4 شهور بعد تركيب الخيوط.
8. في بعض الحالات قد تقتضي الحاجة لتركيب خيوط جديدة لاستكمال النتيجة المرجوة بعد ثلاثة شهور وفى هذه الحالة يتكفل المريض بتكلفة الخيوط فقط.
9. لقد أتيحت لي فرصة كافية لمناقشة حالتي وعلاجي مع طبيبي ومعاونيه، وتمت الإجابة على كافة استفساراتي بشكل مقبول لي. أنى أعطيت ما يكفي من المعلومات التي يمكنني على ضونها أن أتخذ قراراً مستنيراً بشأن الخضوع للعلاج الموصي به.ً وأفهم أنه لا ينبغي على أن أوقع اسمي على هذا النموذج حتى يتم الإجابة على كافة أسئلتي بشكل مقبول لي وحتى أفهم كل الكلمات أو المصطلحات الواردة في هذا النموذج.
10. لقد قرأت هذا النموذج وإني أفهمه بشكل كامل وعليه أسمح بهذه العملية / الأجراء أو العلاج وأوافق طوعا عليها. وإنني أدرك أن ممارسة الطب والجراحة ليست علماً دقيقاً، وأنا أقر بأنه لم يقدم لي أي ضمانات بشأن نتائج العملية أو الإجراء. وأفهم أنه لدي الحرية الكاملة لأرفض قبول أي أجراء. وبهذا أعطي موافقتي لعمل الإجراءات المذكرة أعلاه.

❖ نوع التخدير المستخدم اثنـــاء الجراحة ☐ تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ

المريض: ..... **التوقيع:** ..... **المرافق:** ..... **التاريخ:** ..... **الساعة:** .....

إقرار الطبيب

لقد شرحت محتويات هذه الوثيقة للمريض / المرافق وأجبت على أسئلة المريض/ ، وإلى حد علمي، المريض قد تم إعلامه بشكل كاف وقد أعطى موافقته.

الطبيب: ..... التاريخ: .....

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقــة الخطية المستنيرة علي اجراء عملية جراحية (عمل غمازة دائمة – مؤقتة)
(Facial dimple)

المريض:

1- اعطى بموجب هذا الاذن الى الطبيب: ..... ومساعديه لعمل التدخل الجراحي في صورة ----------
2- لقد شرح لي الطبيب كافة الخطوات من الفتح الجراحي والخيوط الجراحية وخطوات الجراحة.
كما أننى اتعهد بالالتزام بتوصيات الطبيب وفى حالة إخلالي بمتابعة اوامر الطبيب فأن الطبيب والفريق الطبي المساعد له غير مسئولين عن نتيجة الجراحة.
3- اتفهم تماما حدوث تورم بالوجه في فترة ما بعد الجراحة والتي قد تمتد لأكثر من أسبوع.
4- لقد أبلغني طبيبي بأنني سأتلقى التخدير الموضعي.
5- تم الشرح والتوضيح التام ان النتيجة النهائية لعمليات الغمازة لا تتم الا بعد مرور شهر على الاقل من تاريخ الجراحة.
& فى حالة الحاجة لأي تدخل اخر بالخد لا يمكن القيام به قبل مرور ستة أشهر من تاريخ اجراء الجراحة.

❖ مضاعفات خاصة بذلك الإجراء الجراحي:

1- وجود تنميل وخدر بالوجنتين بصورة مؤقتة حتى ستة أشهر عقب الجراحة.
2- إصابة العصب الوجهي مما قد يسبب ضعفا بعضلات الوجه بصورة مؤقتة ممتدة لما بين ستة أشهر وعام عقب الجراحة.
3- نزيف تحت الجلد مما قد يؤثر على سلامة وحيوية الجلد.
4- تكدم وتورم بالوجه عقب الجراحة.
5- من الجائز الشعور بعدم الرضا من الشكل النهائي عقب الجراحة.
6- حدوث حساسية من أي من مكونات المواد المستخدمة في الجراحة.
7- عدم التماثل بين الوجنتين.
8- على الرغم من توقع نتائج جيدة، لا يوجد ضمان أو ضمان صريح أو ضمني، على النتائج التي يمكن الحصول عليها.

❖ اعلم تمام العلم ان الأمور الطبية قد يحدث بها أي متغيرات اثناء العملية وان الاجراءات الجراحية قد تختلف من شخص لأخر لذا امنح الاذن لطبيبي بالقيام بما يراه مناسبا اثناء الجراحة لضمان عدم تعرضي لأذى.

❖ اقر بأني اسمح للطبيب بأخذ صور قبل وبعد الجراحة لمتابعة النتائج مع عدم السماح بعرض هذه الصور وأنها تخضع للعلاقة السرية بين الطبيب والمريض.

❖ لقد أتيحت لي فرصة كافية لمناقشة حالتي وعلاجي مع طبيبي ومعاونيه، وتمت الإجابة على كافة استفساراتي بشكل مقبول لي. أنى أعطيت ما يكفي من المعلومات التي يمكنني على ضوئها أن أتخذ قراراً مستنيراً بشأن الخضوع للعلاج الموصي. به.ً وأفهم أنه لا ينبغي على أن أوقع اسمي على هذا النموذج حتى يتم الإجابة على كافة أسئلتي بشكل مقبول لي وحتى أفهم كل الكلمات أو المصطلحات الواردة في هذا النموذج.

❖ لقد قرأت هذا النموذج وإني أفهمه بشكل كامل وعليه أسمح بهذه العملية / الأجراء أو العلاج وأوافق طوعا عليها. وإنني أدرك أن ممارسة الطب والجراحة ليست علماً دقيقاً، وأنا أقر بأنه لم يقدم لي أي ضمانات بشأن نتائج العملية أو الإجراء.ً وأفهم أنه لدي الحرية الكاملة لأرفض قبول أي أجراء. وبهذا أعطي موافقتي لعمل الإجراءات المذكورة أعلاه.

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقــة الخطية المستنيرة علي اجراء عملية جراحية (عمل غمازة دائمة – مؤقتة)
(Facial dimple)

المقر بما فيه (الاسم ثلاثى): ..... ☐ ذكر ☐ انثى السن : .....

الصـفـة : ☐ المريض ☐ ولى الامر ☐ قريب ☐ أخرى .....

في حالة عدم توقيع المريض السبب ☐ قاصر ☐ قصور ذهنى ☐ غائب عن الوعى ☐ أخرى .....

التوقيع : ..... التاريخ : ..... الوقت : ..... رقم تحقيق الشخصية: .....

❖ **الشاهد/ المترجم على توقيع المريض**

الاسم : ..... التوقيع: ..... التاريخ: ..... الوقت: ..... الرقم القومى: .....

❖ **نوع التخدير المستخدم اثنـاء الجراحة** ☐ تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ

الطبيب المعالج:

❖ أقر بأنني قد قمت بشرح طبيعة الإجراء الجراحي المقرر للمريض والبدائل العلاجية له والمضاعفات الوارد حدوثها، كما أعطيت له الفرصة لطرح كافة الأسئلة المتعلقة بذلك الإجراء وقمت بالإجابة عليها.

❖ كما أقر أن العملية الجراحية عاليه تهدف إلى علاج المريض عن طريق اجراء عملية جراحية تجميلية لعمل غمازه بالخد.

❖ كما أقر أنني قد قمت باتخاذ كافة الاحتياطات والفحوصات الطبية المعمول بها قبل إجراء هذا التداخل الجراحي من تحاليل طبية وأشعات مع إلزامي الكامل بمتابعة المريض بعد إجراء الجراحة وحتى تمام الشفاء.

المقر بما فيه:

الطبيب المعالج (الاسم الثلاثي): ..... التوقيع: ..... القسم التابع له: ..... التاريخ: ..... الوقت: .....

ملاحظات هامـــة:

- لا يسمح بإجراء أي تعديلات علي هذا النموذج بعد الانتهاء من تعبئته وإنما يستبدل بنموذج آخر جديد.
- يحتفظ المريض أو من ينوب عنه بنسخة من هذا الإقرار.

رقم تذكرة المريض	.....

نموذج الموافقة الخطية المستنيرة على حقن بوتكس (Botox)

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

المريض:

بصفتك جزء من العملية الطبية ومشارك في اتخاذ القرار الطبي تم تصميم هذا الاقرار للتأكد من المامك التام المستنير بالإجراءات الطبية المتبعة وانه قد تمت الاجابة على كل تساؤلاتك واستفساراتك بواسطة الطبيب المعالج.

1. اعطى بموجب هذا الاذن الى الطبيب: ..... ومساعديه لعمل حقن بوتكس نوع .....
2. في أبريل 2002، تمت الموافقة على استخدام البوتوكس من قبل إدارة الأغذية والعقاقير بالولايات الامريكية للعلاج التجميلي لتجاعيد الجبهه والجبين و تجاعيد أقدام الغربان بجانب العين . كما يمكن علاج شرائط العنق بطريقة "خارج التسمية "off-label" fashion"
3. لقد شرح لي الطبيب كافة الخطوات والبدائل الأخرى. كما أنني اتعهد بالالتزام بتوصيات الطبيب وفى حالة إخلالي بمتابعة اوامر الطبيب فأن الطبيب والفريق الطبي المساعد له غير مسئولين عن نتيجة الحقن.
4. تشمل البدائل العلاجية الأخرى، عدم معالجة تجاعيد الجلد بأي وسيلة .قد يتم تحسين تجاعيد الجلد عن طريق علاجات أخرى أو أنواع بديلة من الجراحة مثل شد الوجه أو شد الحاجب.
5. اتفهم تماما حدوث تورم او كدمات او ازرقاق بالوجه في فترة ما بعد الحقن والتي قد تمتد لأكثر من أسبوع.
6. أتفهم انه يقوم على إرخاء العضلات في مناطق الوجه والرقبة التي تسبب التجاعيد المرتبطة بتعبيرات الوجه .يمكن أن يؤدي العلاج بالبوتكس إلى جعل خطوط تعبيرات الوجه أو التجاعيد أقل وضوحًا أو تختفي بشكل أساسي.
7. تم الشرح والتوضيح التام ان النتيجة النهائية للبوتكس لا تتم الا بعد مرور اسبوع على الاقل من تاريخ الحقن. وفى حالة الحاجة لأي تدخل اخر لا يمكن القيام به قبل مرور اسبوع من تاريخ الحقن.
8. تم الايضاح لي بان البوتكس يعمل لمدة تتراوح من 3-6 أشهر.
9. في بعض الحالات النادرة قد يحدث حساسية تتحسن بالعلاج.
10. قد تتأثر العضلات التي ترفع الجفن، إذا هاجرت هذه المادة اسفل منطقه الحقن .في حالة حدوث هذه المشكلة، قد تكون هناك حاجة إلى علاجات إضافية مثل قطرات العين .والذي يتحسن في فترة لا تقل عن شهر من الحقن.
11. من الممكن عدم الحصول على نتيجة كاملة في العضلات المستهدفة. يمكن إجراء حقن إضافي للوصول إلى المستوى المطلوب من النتيجة حتى يتم تحقيق الهدف.
12. عدم التماثل: عادة ما يكون الوجه البشري ومنطقة الجفن غير متناسقة فيما يتعلق بالتشريح الهيكلي والوظيفة. يمكن أن يكون هناك اختلاف من جانب إلى آخر من حيث الاستجابة لحقن البوتكس.
13. يعاني بعض المرضى من صعوبة في إغلاق جفونهم، وقد تحدث مشاكل في القرنية بسبب الجفاف. في حالة حدوث هذه المضاعفات النادرة، قد تكون هناك حاجة إلى علاجات إضافية أو قطرات العين الواقية أو العدسات اللاصقة أو الجراحة.
14. قد تحدث الرؤية المزدوجة إذا انتقلت مادة البوتكس إلى منطقة العضلات التي تتحكم في حركات مقلة العين.
15. التأثير طويل الأمد على الأنسجة غير معروف .مخاطر وعواقب الحقن العرضي في الأوعية الدموية غير معروفة ولا يمكن التنبؤ بها .هناك احتمال أن يتم اكتشاف عوامل خطر إضافية.
16. اتعهد أنني غير حامل وانى لست مرضعة وليس لدي أي مرض عصبي كبير بما في ذلك على سبيل المثال لا الحصر الوهن العضلي والتصلب المتعدد.
17. اقر بأني اسمح للطبيب بأخذ صور قبل وبعد الحقن لمتابعة النتائج مع عدم السماح بعرض هذه الصور وأنها تخضع للعلاقة السرية بين الطبيب والمريض.
18. لقد أتيحت لي فرصة كافية لمناقشة حالتي وعلاجي مع طبيبي ومعاونيه، وتمت الإجابة على كافة استفساراتي بشكل مقبول لي. أنى أعطيت ما يكفي من المعلومات التي يمكنني على ضوئها أن أتخذ قراراً مستنيراً بشأن الخضوع للعلاج الموصي به. وأفهم أنه لا ينبغي على أن أوقع اسمي على هذا النموذج حتى يتم الإجابة على كافة أسئلتي بشكل مقبول لي وحتى أفهم كل الكلمات أو المصطلحات الواردة في هذا النموذج.

التوقيع ..... المريض: ..... المرافق: ..... التاريخ: ..... الساعة: .....

إقرار الطبيب

لقد شرحت محتويات هذه الوثيقة للمريض / المرافق وأجبت على أسئلة المريض/ ، وإلى حد علمي، المريض قد تم إعلامه بشكل كاف وقد أعطى موافقته.

الطبيب: ..... التاريخ: .....

نموذج الموافقة الخطية المستنيرة على حقن الفيللر (Filler)

المريض:

بصفتك جزء من العملية الطبية ومشارك في اتخاذ القرار الطبي تم تصميم هذا الاقرار للتأكد من المامك التام المستنير بالإجراءات الطبية المتبعة وانه قد تمت الاجابة على كل تساؤلاتك واستفساراتك بواسطة الطبيب المعالج.

1. اعطى بموجب هذا الاذن الى الطبيب ..... ومساعديه لعمل حقن فيللر نوع ....
2. لقد شرح لي الطبيب كافة الخطوات. كما أنني اتعهد بالالتزام بتوصيات الطبيب وفى حالة إخلالي بمتابعة اوامر الطبيب فأن الطبيب والفريق الطبي المساعد له غير مسئولين عن نتيجة الحقن.
3. اتفهم تماما حدوث تورم بالوجه أو كدمات او ازرقاق في فترة ما بعد الحقن والتي قد تمتد لأكثر من أسبوع.
4. قد يحدث عقيدات تحت الجلد.
5. لقد أبلغني طبيبي بأن الفيللر قد يحتوي على مخدر موضعي.
6. تم الشرح والتوضيح التام ان النتيجة النهائية للفيللر لا تظهر الا بعد مرور اسبوع على الاقل من تاريخ الحقن. وفى حالة الحاجة لأي تدخل اخر بالخد لا يمكن القيام به قبل مرور اسبوع من تاريخ الحقن.
7. لا تحدث المضاعفات في الغالبية العظمي ولكن اتفهم وجود بعض المضاعفات التي قد تحدث:
   - نزيف وكدمات.
   - مكان الابره قد يحدث علامه عاده ما تزول في غضون أيام قليلة.
   - حساسية الجلد: قد يحدث الطفح الجلدي والحكة والحنان والتورم بعد الحقن.
   - قد لا يحقق النتيجة المرجوه اما بالزيادة او النقص.
   - عدم التماثل: يكون وجه الإنسان غير متماثل في مظهره وتشريحه.
   - تورم الجلد :يمكن أن يحدث الورم .
   - مادة حشو الأنسجة المرئية :قد يكون من الممكن رؤية أي نوع من الفيللر التي تم حقنها في المناطق التي يكون فيها الجلد رقيقًا.
   - الأورام الحبيبية :الكتل المؤلمة في الجلد والأنسجة الأعمق بعد حقن الحشو نادرة للغاية.
   - نخر الجلد :من غير المألوف للغاية موت الجلد والأنسجة الرخوة العميقة بعد الحقن .يمكن أن يؤدي نخر الجلد إلى ظهور ندبات غير مقبولة .في حالة حدوث هذه المضاعفات، قد تكون هناك حاجة إلى علاجات إضافية أو جراحة.
   - قد يقلل وجود الأجسام المضادة لحمض الهيالورونيك من فعالية هذه المادة أو ينتج عنه تفاعل في الحقن اللاحقة.
   - الحقن العرضي داخل الشرايين :من النادر للغاية، يمكن حقن المواد المالئة عن طريق الخطأ في الهياكل الشريانية وتسبب انسدادًا في تدفق الدم .قد ينتج عن ذلك نخر في الجلد أو تلف تدفق الدم إلى العين، مما يؤدي إلى فقدان الرؤية .مخاطر وعواقب الحقن العرضي داخل الأوعية للحشو غير معروفة وليست متوقعة.
8. اقر بأني اسمح للطبيب بأخذ صور قبل وبعد الجراحة لمتابعة النتائج مع عدم السماح بعرض هذه الصور وأنها تخضع للعلاقة السرية بين الطبيب والمريض.
9. تم الايضاح لي بان فترة بقاء الفيللر تتراوح ما بين 9 أشهر الى سنتين. وان في اغلب الحالات حقنة فيللر واحدة لا تكفي للوصول الى الحجم المطلوب وعليه قد يحتاج الوصول للنتيجة المرجوة حقن أكثر من حقنة.
10. لقد أتيحت لي فرصة كافية لمناقشة حالتي وعلاجي مع طبيبي ومعاونيه، وتمت الإجابة على كافة استفساراتي بشكل مقبول لي. أنى أعطيت ما يكفي من المعلومات التي يمكنني على ضوئها أن أتخذ قراراً مستنيراً بشأن الخضوع للعلاج الموصي به." وأفهم أنه لا ينبغي على أن أوقع اسمي على هذا النموذج حتى يتم الإجابة على كافة أسئلتي بشكل مقبول لي وحتى أفهم كل الكلمات أو المصطلحات الواردة في هذا النموذج.

التوقيع: المريض: ..... المرافق: ..... التاريخ: ..... الساعة: .....

إقرار الطبيب

لقد شرحت محتويات هذه الوثيقة للمريض / المرافق وأجبت على أسئلة المريض/ ..... ، وإلى حد علمي، المريض قد تم إعلامه بشكل كاف وقد أعطى موافقته.

الطبيب: ..... التاريخ: .....

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

Guidelines
For Surgical Practice of Blepharoplasty

Definition:

Blepharoplasty is the name of the surgery that removes or repositions fat to reduce puffiness in addition to trimming excess skin away

Blepharoplasty: is one of the most performed facial cosmetic procedures.

The followings are the most common indications for blepharoplasty:

1. Loose or sagging skin that creates folds or disturbs the natural contour of the upper eyelid, sometimes impairing vision
2. Fatty deposits that appear as puffiness in the eyelids
3. Bags under the eyes
4. Drooping lower eyelids that reveal white below the iris
5. Excess skin and fine wrinkles of the lower eyelid

Who is the good candidate for Blepharoplasty ?

- Healthy individuals with no medical conditions that can impair healing.
- Nonsmokers.
- Individuals with a positive outlook and realistic goals.
- Individuals without serious eye conditions.

It is worthy mentioning that blepharoplasty can also be combined with other facial & skin rejuvenation procedures such as brow or mid-face lift, lasers or chemical skin resurfacing.

Guidelines For Preoperative Preparation

Preoperative patient evaluation for blepharoplasty should document medical and ophthalmologic history such as chronic systemic diseases and medications.
Ophthalmologic history should be obtained, including vision, corrective lenses, trauma, glaucoma, allergic reactions, excess tearing, and dry eyes.
No cosmetic surgery of the periorbital region should be performed for a minimum of six months following corneal refractory surgery. Schirmer's test should be considered if there is history of dry eye.
In addition to complete eye examination, the evaluation of the periorbital area should take into account skin quality and quantity, underlying three-dimensional soft tissue contours, and the bony skeletal support.

Assessment of the upper eyelid

Upper eyelid dermatochalasis is the loss of elasticity and support in the skin. This can create a fold of excess upper eyelid skin, which can impair the function of the eye, including supero-lateral visual field obstruction
Evaluation of pre-septal and eyebrow fat pads is important in redefining the superior sulcus.
Upper eyelid ptosis should also be noted, since it can be corrected simultaneously.

Assessment of the lower eyelid

Lower eyelids should be assessed for skin excess and fat herniation, which typically presents as medial, central, and lateral fat pads.

Lower eyelid fat becomes more prominent in upgaze and less prominent in downgaze. Downward displacement of the lateral canthus can result from disinsertion, laxity, or the presence of a prominent eye. The posterior displacement of the orbital rim in relation to the anterior cornea and lower lid margin, a negative vector, should be noted preoperatively.

Prominent or deep-set eyes should be documented with exophthalmometry. Malar anatomy needs to be evaluated for periorbital hollows.

Assessment of the eyebrow

Brow ptosis is assessed by evaluating the position of the eyebrow in relation to the superior orbital rim.

Asymmetry in the upper and lower eyelids and brow position is common and should be recognized and addressed individually.

Anesthesia:

Blepharoplasty may be performed under either local or general anesthesia depending upon the surgical plan, patient and surgeon preference, and need for concomitant operations.

A simple upper or lower eyelid blepharoplasty where only skin or fat is excised can be performed under local anesthesia.

Other more invasive procedures, such as lower blepharoplasty combined with fat repositioning, mid-face lift, or endoscopic browlift may need intravenous sedation, or general anesthesia.

The incision:

The incision lines for eyelid surgery should be designed so the resultant scars will be well concealed within the natural structures of the eyelid region.

The upper eyelid can be corrected through an incision within the natural crease on the eyelid. This allows for removal or repositioning of fat deposits, tightening of muscles and removal of excess skin.

Conditions of the lower eyelid may be corrected with an incision just below the lower lash line. Through this incision, excess skin in the lower eyelid is removed. Again, the excess fat can be repositioned or removed.

A transconjunctival incision, created on the inside of the lower eyelid, is an alternate technique to correct lower eyelid conditions and redistribute or remove excess fat. With this technique, no skin is removed

Postoperative care:

Postoperatively, patients should be advised to use ice packs on the surgical site for three days to minimize postoperative swelling, and topical antibiotic ophthalmic ointment on the incision sites for two weeks.

Non-absorbable sutures, if used, can be removed after one week.

Complications:

Possible complications include upper eyelid retraction with scleral show from anterior lamellar inadequacy, lagophthalmos, acquired diplopia and corneal exposure.

The most common complication of cosmetic surgery is failure to meet the patient's expectations. This can be avoided by preoperative counseling and identifying
reasonable expectations.

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقة الخطية المستنيرة على اجراء عملية جراحية تجميلية بجفن العين (اليمنى/اليسرى)
(Right/Left) Eyelid Surgery (Blepharoplasty)

المريض:

أقر أنا الموقع أدناه أنني موافق على إجراء التداخل الجراحي المبين عالية، وأقر أن الطبيب قد قام بشرح طبيعة ذلك التداخل الجراحي والهدف منه، كما أوضح البدائل المتاحة لهذا الإجراء الجراحي. كما أقر أنني على كامل المعرفة بالمضاعفات الطبية والجراحية ممكنة الحدوث من جرّاء تلك العملية.

❖ **معلومات عامه:**

شد الجفن هو إجراء جراحي لإزالة الجلد والعضلات الزائدة من الجفن العلوي والسفلي. يمكن إزالة الأنسجة الدهنية التي تنتج التكتل أو إعادة وضعها بشكل انتقائي .يمكن أن يحسن شد الجفن من تدلي الجلد. وقد يتطلب المريض جراحة ثانوية لتحسين النتيجة.

❖ **مضاعفات خاصة بذلك الإجراء الجراحي:**

1. عدم القدرة على غلق الجفن العلوي بصورة تامة لمدة مؤقتة عقب الجراحة مما قد يستلزم علاجا طبيا.
2. وجود تجمع دموي حول العين موضع الجراحة.
3. انقلاب جفن العين للخارج.
4. ضعف مؤقت بجفن العين السفلي.
5. زيادة في افراز الدموع والحساسية للضوء خلال الأيام الأولى عقب الجراحة.
6. زغللة أو تهيج أو ازدواج بالرؤية في الأيام الأولى عقب الجراحة.
7. عدم انتظام سطح وشكل ولون الجلد موضع الجراحة، وعدم تماثل الشكل عقب الجراحة، كذلك تغير بالإحساس موضع الجراحة.
8. من الجائز الشعور بعدم الرضا من الشكل النهائي عقب الجراحة.
9. حدوث حساسية من أي من مكونات المواد المستخدمة في الجراحة.

❖ كما أقر أنني موافق على أن يقوم الجرّاح المعالج باستئصال أية نسيج أو جزء مصاب والقيام بالتحاليل الطبية اللازمة إذا كان مثل ذلك التصرف لفائدتي ومتوافق مع القوانين والتشريعات الطبية المعمول بها بجمهورية مصر العربية.

❖ كما أوافق على أية اجراءات استثنائية إذا تغيرت الظروف العادية المحيطة بإجراء الجراحة. كما أوافق على نقل الدم أو مكونات الدم في حالة استدعت الحاجة أثناء الجراحة المذكورة أعلاه وبعد ال (24) ساعة الأولى من العملية.

❖ كما أوافق بالتقاط صور فوتوغرافية أو تسجيل فيديو لغرض التوثيق الطبي مع التأكيد على سرية الهوية والخصوصية.

الموافقة الخطية المستنيرة على اجراء عملية جراحية تجميلية بجفن العين (اليمنى/اليسرى)

(Right/Left) Eyelid Surgery (Blepharoplasty)

النموذج المعتمد من الجمعية المصرية لجراحى التجميل والاصلاح

المقر بما فيه (الاسم ثلاثى): ..... ☐ذكر ☐ انثى السن : .....

الصفة : ☐المريض ☐ ولى الامر ☐ قريب ☐ أخرى .....

في حالة عدم توقيع المريض السبب ☐ قاصر ☐ قصور ذهنى ☐ غائب عن الوعى ☐ أخرى .....

التوقيع : ..... التاريخ : ..... الوقت : ..... رقم تحقيق الشخصية: .....

الطبيب المعالج:

- أقر بأنني قد قمت بشرح طبيعة الإجراء الجراحي المقرر للمريض والبدائل العلاجية له والمضاعفات الوارد حدوثها، كما أعطيت له الفرصة لطرح كافة الأسئلة المتعلقة بذلك الإجراء وقمت بالإجابة عليها.
- كما أقر أن العملية الجراحية عالية تهدف إلى علاج المريض عن طريق شد البطن.
- كما أقر أنني قد قمت باتخاذ كافة الاحتياطات والفحوصات الطبية المعمول بها قبل إجراء هذا التداخل الجراحي من تحاليل طبية وأشعات مع التزامي الكامل بمتابعة المريض بعد إجراء الجراحة وحتى تمام الشفاء.

- نوع التخدير المستخدم اثنـــاء الجراحة تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ ☐

المقر بما فيه:

الطبيب المعالج (الاسم الثلاثي): ..... التوقيع: ..... القسم التابع له: ..... التاريخ: ..... الوقت: .....

- الشّاهد/ المترجم على توقيع المريض

الاسم : ..... التوقيع: ..... التاريخ: ..... الوقت: ..... الرقم القومى: .....

ملاحظات هامـــة:

- لا يسمح بإجراء أي تعديلات علي هذا النموذج بعد الانتهاء من تعبئته وإنما يستبدل بنموذج آخر جديد.
- يحتفظ المريض أو من ينوب عنه بنسخة من هذا الإقرار ويعتبر سارى لمدة اسبوع من تاريخ توقيع المريض

رقم تذكرة المريض	.....

Otoplasty Guidelines

Definition: The term otoplasty refers to surgical procedures designed to correct congenital anomalies of the auricle to give a more natural and anatomic appearance.

Guidelines:

1. Prominent ears can be present in many forms, including cup ear, shell ear, bat ear, and lop ear. The most common deformity seen in prominent ears is an underdeveloped antihelix at a greater than 90° angle, often observed with a prominent lateral projection of the conchal bowl.
2. Surgery should be performed when the child reaches 6-7 years of age or in adults at any age
3. Indication: Otoplasty is indicated for correction of ears that protrude more than 20 mm and at an angle greater than 35° from the occipital scalp. One or multiple malformed auricular subunits may be managed.
4. Any deformity or asymmetry present between both ears should be documented and explained to the patient and his parents.
5. Preoperative photographs should be taken in standard frontal, lateral, and oblique positions. Additionally, a bird's eye view from above and/or posterior views can help document lateralization. Close-up lateral and oblique photographs can aid in analyzing the particular deformities in each ear.
6. Patient should be made aware of possible complications including:
    - Recurrence
    - Hematoma
    - Stitch sinus
    - Infection
    - Wound dehiscence
7. Contraindications:
    - Otoplasty is contraindicated in any patient with unrealistic expectations.
    - Patients unable or unwilling to cooperate with postoperative care are not candidates for surgery.
    - Patients with a history of hypertrophic scarring or keloid formation should be aware that these may occur after otoplasty, possibly distorting an otherwise excellent surgical result.

الموافقة الخطية المستنيرة على اجراء عملية جراحية لتجميل الاذن الخفاشيه
(Otoplasty – bat ear)

المريض:

أقر أنا الموقع أدناه أنني موافق على إجراء التداخل الجراحي المبين عاليه، وأقر أن الطبيب قد قام بشرح طبيعة ذلك التداخل الجراحي والهدف منه، كما أوضح البدائل المتاحة لهذا الإجراء الجراحي. كما أقر أنني على كامل المعرفة بالمضاعفات الطبية والجراحية ممكنة الحدوث من جرّاء تلك العملية.

❖ **معلومات عامه:**

1. هي عملية جراحية لإعادة تشكيل الأذن .يمكن استخدام مجموعة متنوعة من الأساليب والأساليب المختلفة لإعادة تشكيل البروز الخلقي في الأذنين .
2. لا يوجد نوع واحد من عمليات جراحة تجميل الأذن الذى يلبي احتياجات كل المرضى انما تكون جراحة تجميل الأذن مخصصه لكل مريض، اعتمادًا على احتياجاته.
3. يتم عمل الجروح في أماكن غير واضحة خلف الأذن الا انه لا يختفي أثاره نهائيا.
4. المحافظة على الأذن من التعرض لأي اصابة في خلال فترة النقاهة. ضرورة الالتزام بتوصيات الطبيب وفى حالة إخلالي بمتابعة اوامر الطبيب فأن الطبيب والفريق الطبي المساعد له غير مسئولين عن نتيجة الجراحة.
5. حدوث تورم بالأذن وازرقاق في فترة ما بعد الجراحة والتي قد تمتد لأكثر من أسبوعين.
6. أفضل المرشحين لهذا النوع من الجراحة هم الأفراد الذين يبحثون عن التحسن وليس الكمال .
7. تم الشرح والتوضيح التام ان النتيجة النهائية لعمليات تجميل الاذن لا تتم الا بعد مرور شهرين من تاريخ الجراحة. قد تحتاج الي جراحة إضافية ضرورية (إعادة العمليات) ، وفى حالة الحاجة لأي تدخل اخر بالأذن لا يمكن القيام به قبل مرور 6 أشهر من تاريخ اجراء الجراحة.

بدائل علاجيه: هي عمليه اختياريه لذلك فان البدائل تشمل عدم الخضوع الي عملية تجميل الأذن.

❖ **مضاعفات خاصة بذلك الإجراء الجراحي:**

1. ندبات في موضع الجراحة تحتاج الي علاج اخر.
2. عدم التماثل بين صوان الاذنيين في الحجم والشكل والتشريح.
3. الخيوط الجراحية :تستخدم معظم التقنيات الجراحية خيوطًا عميقة .قد تلاحظ هذه الغرز بعد الجراحة .الغرزقد تخترق الجلد تلقائيًا أو تصبح مرئيًا أو تسبب تهيجًا يتطلب إزالة الغرز.
4. كذلك تغير بالإحساس موضع الجراحة.
5. عدم انتظام سطح وشكل ولون الجلد موضع الجراحة.
6. نزيف تحت الجلد مما قد يؤثر على سلامة وحيوية الجلد.
7. تكدم وتورم بالأذن عقب الجراحة.
8. فقدان جزء من الجلد أو الغضاريف الذى قد يؤثر على الشكل الجمالي للأذن. وقد يحتاج الي تدخل أخر.
9. يمكن أن يحدث الصلابة المفرطة بعد الجراحة بسبب الندوب الداخلية.
10. على الرغم من توقع نتائج جيدة، لا يوجد ضمان صريح أو ضمني، على النتائج التي يمكن الحصول عليها.
11. من الجائز الشعور بعدم الرضا من الشكل النهائي عقب الجراحة.
12. حدوث حساسية من أي من مكونات المواد المستخدمة في الجراحة.

الموافقة الخطية المستنيرة على اجراء عملية جراحية لتجميل الاذن الخفاشيه
(Otoplasty – bat ear)

النموذج المعتمد من الجمعية المصرية لجراحى التجميل والاصلاح

المقر بما فيه (الاسم ثلاثى): ..... ☐ذكر ☐ انثى السن : .....

الصـفـة : ☐المريض ☐ ولى الامر ☐ قريب ☐ أخرى .....

في حالة عدم توقيع المريض السبب ☐ قاصر ☐ قصور ذهنى ☐ غائب عن الوعى ☐ أخرى .....

التوقيع : ..... التاريخ : ..... الوقت : ..... رقم تحقيق الشخصية: .....

❖ نوع التخدير المستخدم اثنـاء الجراحة ☐ تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ

الطبيب المعالج:

- ❖ أقر بأنني قد قمت بشرح طبيعة الإجراء الجراحي المقرر للمريض والبدائل العلاجية له والمضاعفات الوارد حدوثها، كما أعطيت له الفرصة لطرح كافة الأسئلة المتعلقة بذلك الإجراء وقمت بالإجابة عليها.
- ❖ كما أقر أن العملية الجراحية عالية تهدف إلى علاج المريض عن طريق اجراء عملية جراحية تجميلية لتجميل للأذن.
- ❖ كما أقر أنني قد قمت باتخاذ كافة الاحتياطات والفحوصات الطبية المعمول بها قبل إجراء هذا التداخل الجراحي من تحاليل طبية وأشعات مع إلزامي الكامل بمتابعة المريض بعد إجراء الجراحة وحتى تمام الشفاء.

المقر بما فيه:

الطبيب المعالج (الاسم الثلاثى): ..... التوقيع: ..... القسم التابع له: ..... التاريخ: ..... الوقت: .....

❖ الشاهد/ المترجم على توقيع المريض

الاسم : ..... التوقيع: ..... التاريخ: ..... الوقت: ..... الرقم القومى: .....

ملاحظات هامـــة:

- لا يسمح بإجراء أي تعديلات علي هذا النموذج بعد الانتهاء من تعبئته وإنما يستبدل بنموذج آخر جديد.
- يحتفظ المريض أو من ينوب عنه بنسخة من هذا الإقرار.

رقم تذكرة المريض	.....

Guidelines of facelift Surgery

Definition : face lift surgery is an aesthetic procedure aiming at correcting aging changes of the face to give it a more youthful and harmonious look.

Target population: face lift is mainly needed by patients of middle and old age. The procedure may be occasionally indicated in younger people who suffer from premature aging.

Guidelines:

1. Preoperative evaluation should show that patient has realistic expectations and is not motivated to do this surgery to satisfy a partner or to get a job.
2. The patient should be checked medically as regards cardiac, respiratory or any other systemic disease.
3. The patient should be controlled as regards diabetes, hypertension and should stop anticoagulant drugs one week before surgery.
4. The surgeon should discuss with the patient the improvement he or she is seeking as the patient may be satisfied with a neck lift (lower facelift) or a full face lift is a more appropriate procedure
5. Face lift surgery could be done under general or local anesthesia with sedation.
6. The patient should be educated about the incisions done in face lift procedure and the may be marked on him.
7. The patient should be educated about the possible side. Effects and complications that may occur after surgery before signing the consent.
8. Full face photos are required in front, bilateral profile and bilateral semi-profile views.
9. The patient should be educated about the post-operative care which includes:
    a. The face dressing and how long it will stay.
    b. Management of post-operative pain.
    c. Management of drains.
    d. Antibiotics anti oedema and anti- bruses drugs regime.
    e. Timing of suture removal.
    f. The required limitation of facial movement ant the duration of this limitation
10. The patient should be aware that the result of surgery should be evaluated three months after surgery. The result should be documented with photos in the same views taken preoperatively.
11. The patient should be aware that aging process will not stop after face lift surgery. Face lift results stay for a variable period according to the rate of aging process. The face lift result may stay for two years or less before aging stigmata starts to appear again.
12. Revision of face lift after reappearance of aging signs is a possible and safe procedure. However the patient should be educated that this is not correction of unsatisfactory result or a complication this is a new procedure.

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقة الخطية المستنيرة على اجراء عملية جراحية تجميلية لشد وتجميل الوجه
Facelift (Rhytidectomy)

المريض:
أقر أنا الموقع أدناه أنني موافق على إجراء التداخل الجراحي المبين عاليه، وأقر أن الطبيب قد قام بشرح طبيعة ذلك التداخل الجراحي والهدف منه، كما أوضح البدائل المتاحة لهذا الإجراء الجراحي، كما أقر أنني على كامل المعرفة بالمضاعفات الطبية والجراحية ممكنة الحدوث من جرّاء تلك العملية.

❖ **معلومات عامه:**

1. شرح لي الطبيب كافة الخطـوات من الفتح الجراحي والخيوط الجراحية وخطوات الجراحة. كما أنني اتعهد بالالتزام بتوصيات الطبيب من ضرورة لبس المشد لمدة لا تقل عن اسبوعين بعد الجراحة. وفى حالة إخلالي بمتابعة اوامر الطبيب فأن الطبيب والفريق الطبي المساعد له غير مسئولين عن نتيجة الجراحة.
2. اتفهم تماما احتمال حدوث تورم او ازرقاق في فترة ما بعد الجراحة والتي قد تمتد لأكثر من ستة أسابيع.
3. لقد أبلغني طبيبي بأنني سأتلقى التخدير كليا او كاملا أو دواء مهدئاً، أو كليهما. وأفهم أن هناك مخاطر وآثارا جانبية مقترنة بالتخدير والمهدئات وأن هذه المخاطر والآثار الجانبية سيتم بحثها معي من قبل طبيب التخدير قبل أن يُجرى على الإجراء.
4. تم الشرح والتوضيح التام ان النتيجة النهائية لعمليات شد الوجه لا تتم الا بعد مرور اربعة أشهر من تاريخ الجراحة او حتى زوال التورم ايهما ابعد.
5. يكون شكل الجرح الممتد من خط الشعر للأذن لخلف الاذن والرقبة ويحتاج الجرح لعلاج لمدة لا تقل عن ستة أشهر لتخفيف إثر الجروح والتي ستترك أثر دائم.
6. النتائج طويلة المدى: قد تحدث تغييرات لاحقة في مظهر الوجه نتيجة الشيخوخة، والتعرض لأشعة الشمس، فقدان الوزن أو زيادة الوزن أو الحمل أو انقطاع الطمث أو ظروف أخرى لا تتعلق بالجراحة.
7. قد تكون الجراحة الثانوية ضرورية لإجراء شد إضافي أو حدوث مضاعفات، قد يكون من الضروري إجراء جراحة إضافية أو علاجات أخرى.

بدائل علاجيه: تتكون من عدم معالجة التراخي في منطقة الوجه والرقبة بعملية شد الوجه. قد يتم محاولة تحسين تراخي الجلد وتجاعيد الجلد والزيادة الدهنية عن طريق العلاجات الأخرى أو جراحة مثل التقشير بالليزر أو التقشير الكيميائي للوجه أو شفط الدهون. المضاعفات المحتملة تحدث أيضًا بالأشكال الجراحية البديلة للعلاج

الموافقة الخطية المستنيرة على اجراء عملية جراحية تجميلية لشد وتجميل الوجه
Facelift (Rhytidectomy)

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

❖ مضاعفات خاصة بذلك الإجراء الجراحي:

1. وجود تنميل وخدر بالوجنتين بصورة مؤقتة حتى ستة أشهر عقب الجراحة.
2. إصابة العصب الوجهي مما قد يسبب ضعفا بعضلات الوجه بصورة مؤقتة ممتدة لما بين ستة أشهر وعام عقب الجراحة. وقد يكون بصوره دائمة.
3. نزيف شديد تحت الجلد مما قد يؤثر على سلامة وحيوية الجلد ويحتاج الي تدخل اخر.
4. تكدم وتورم بالوجه عقب الجراحة.
5. من الجائز الشعور بعدم الرضا من الشكل النهائي عقب الجراحة.
6. حدوث حساسية من أي من مكونات المواد المستخدمة في الجراحة.
7. تساقط الشعر: قد يحدث تساقط الشعر في مناطق الوجه. هذا لا يمكن التنبؤ به.
8. على الرغم من توقع نتائج جيدة، لا يوجد ضمان أو ضمان صريح أو ضمني، على النتائج التي يمكن الحصول عليها.
9. مشاكل التئام الجروح: بعض الحالات الطبية والمكملات الغذائية والأدوية قد تؤخر وتتداخل مع الالتئام. المدخنون أكثر عرضة لخطر فقدان الجلد ومضاعفات التئام الجروح.
10. الندبات: جميع العمليات تترك ندبات، بعضها أكثر وضوحا من البعض الآخر. على الرغم من التئام الجروح بشكل جيد بعد الجراحة، قد تحدث ندوب غير طبيعية داخل الجلد والأنسجة العميقة. قد تكون الندوب غير جذابة ولونها مختلف عن لون البشرة المحيطة. قد يختلف مظهر الندبة في نفس الندبة. قد تكون الندوب غير متماثلة (تظهر مختلفة على الجانب الأيمن والأيسر من الجسم). هناك إمكانية وجود علامات واضحة في الجلد من الغرز. في بعض الحالات، قد تتطلب الندوب مراجعة جراحية أو علاجيه.
11. مصل الدم seroma: نادرًا ما يتراكم السوائل بين الجلد والأنسجة الكامنة بعد الجراحة. في حالة حدوث هذه المشكلة، قد تتطلب إجراءات إضافية.

❖ نصائح أخري:

1. المرضى الذين يدخنون حاليًا أو يستخدمون منتجات التبغ أو النيكوتين (اللصقة أو اللثة أو بخاخ الأنف) في حالة خطر أكبر على المضاعفات الجراحية الهامة للوفاة الجلدية وتأخر الشفاء وتندب إضافي.
2. الأدوية والمكملات الغذائية العشبية: ممكن تؤدي الي المزيد من النزيف.
3. خطط السفر والعمل: تنطوي أي عملية جراحية على خطر حدوث مضاعفات قد تؤخر الشفاء وتأخير عودتك إلى وضعها الطبيعي في الحياة.

❖ كما أقر أنني موافق على أن يقوم الجرّاح المعالج باستئصال أية نسيج أو جزء مصاب والقيام بالتحاليل الطبية اللازمة إذا كان مثل ذلك التصرف لفائدتي ومتوافق مع القوانين والتشريعات الطبية المعمول بها بجمهورية مصر العربية.

❖ كما أوافق على أية اجراءات استثنائية إذا تغيرت الظروف العادية المحيطة بإجراء الجراحة. كما أوافق على نقل الدم أو مكونات الدم في حالة استدعت الحاجة أثناء الجراحة المذكورة أعلاه وبعد ال (24) ساعة الأولى من العملية.

❖ كما أوافق بالتقاط صور فوتوغرافية أو تسجيل فيديو لغرض التوثيق الطبي مع التأكيد على سرية الهوية والخصوصية.

الموافقة الخطية المستنيرة على اجراء عملية جراحية تجميلية لشد وتجميل الوجه
Facelift (Rhytidectomy)

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

المقر بما فيه (الاسم ثلاثى): ..... ☐ذكر ☐انثى السن : .....

الصـفـة : ☐المريض ☐ولى الامر ☐قريب ☐أخرى .....

في حالة عدم توقيع المريض السبب ☐ قاصر ☐ قصور ذهنى ☐ غائب عن الوعى ☐ أخرى .....

التوقيع : ..... التاريخ : ..... الوقت : ..... رقم تحقيق الشخصية: .....

❖ نوع التخدير المستخدم اثنـاء الجراحة ☐ تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ

الطبيب المعالج:

❖ أقر بأنني قد قمت بشرح طبيعة الإجراء الجراحي المقرر للمريض والبدائل العلاجية له والمضاعفات الوارد حدوثها، كما أعطيت له الفرصة لطرح كافة الأسئلة المتعلقة بذلك الإجراء وقمت بالإجابة عليها.

❖ كما أقر أن العملية الجراحية عالية تهدف إلى علاج المريض عن طريق شد البطن.

❖ كما أقر أنني قد قمت باتخاذ كافة الاحتياطات والفحوصات الطبية المعمول بها قبل إجراء هذا التداخل الجراحي من تحاليل طبية وأشعات مع التزامي الكامل بمتابعة المريض بعد إجراء الجراحة وحتى تمام الشفاء.

المقر بما فيه:

الطبيب المعالج (الاسم الثلاثي): ..... التوقيع: ..... القسم التابع له: ..... التاريخ: ..... الوقت: .....

❖ الشاهد/ المترجم على توقيع المريض

الاسم : ..... التوقيع: ..... التاريخ: ..... الوقت: ..... الرقم القومى: .....

ملاحظات هامـــة:

- لا يسمح بإجراء أي تعديلات علي هذا النموذج بعد الانتهاء من تعبئته وإنما يستبدل بنموذج آخر جديد.
- يحتفظ المريض أو من ينوب عنه بنسخة من هذا الإقرار.

رقم تذكرة المريض	.....

Guidelines
For forehead lift.

Definition: forehead is a procedure to correct wrinkles of the forehead and raise droopy eyebrows that are due to the effect of gravity and aging.

Target population: adult population with wrinkled forehead and droopy eyebrows. The operation is not suitable for patient with a very long forehead as the outcome of the procedure may lead to an extremely out of proportion long forehead.

Guidelines:

1. The surgeon should explain the cons and pros of the procedure and should show the patient the options of non-surgical management as alternative such as Botulinum toxins and use of laser to treat wrinkles. It should be noted also that brow lift could be done in conjunction with blepharoplasty.
2. The patient should be aware of the possible result and has realistic expectations.
3. The patient should be educated about the procedure to be done whether with a coronal incision or a limited temporal incision or as an endoscopic procedure.
4. Patient should be fit for surgery with good blood picture, controlled diabetes and hypertension.
5. The patient should stop anticoagulant drugs for a week before surgery.
6. A photo of frontal view is taken before surgery.
7. The operation could be done under general or local anesthesia.
8. The patient should be educated about possible complications before signing consent.
9. The patient should be educated about post-operative instruction
    a. Oedema and bruises of lids can occur and is temporary and could be managed by warm foment and eye drops.
    b. Analgesics usually needed in first few days.
    c. The patient should lie in bed in a semi-sitting position for the first week.
    d. Anibiotics and ant oedema drugs are usually prescribed.
10. The result of surgery will be evaluated six months after surgery.

الموافقة الخطية المستنيرة على اجراء عملية جراحية (جراحة رفع الحاجب)
(Brow Lift Surgery)

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

المريض:
أقر أنا الموقع أدناه أنني موافق على إجراء التداخل الجراحي المبين عاليه، وأقر أن الطبيب قد قام بشرح طبيعة ذلك التداخل الجراحي والهدف منه، كما أوضح البدائل المتاحة لهذا الإجراء الجراحي. كما أقر أنني على كامل المعرفة بالمضاعفات الطبية والجراحية ممكنة الحدوث من جرّاء تلك العملية.

❖ **معلومات عامه:**

1. غالبًا ما تظهر منطقة الجبين والحاجب علامات ملحوظة للشيخوخة .قد يؤدي الرخاوة في هذه الأنسجة إلى تدلي الحاجبين، والجفن، وخطوط التجهم .في جراحة رفع الحاجب، يتم الاجراء الجراحي لتنعيم الجبهة، ورفع الحاجبين ، وتحسين خطوط التجهم .يمكن إجراء شد الحاجب بمفرده، أو بالاشتراك مع إجراءات أخرى، مثل جراحة شد الوجه أو الجفن.
2. من الممكن تنفيذ الإجراء من خلال مجموعة متنوعة من الأساليب الحديثة، بما في ذلك إجراءها بالمنظار.
3. جراحة رفع الحاجب مخصصة لكل مريض .قد تختلف الشقوق الجراحية المستخدمة مع التقنية التي يختارها الجراح لتلبية احتياجاتك .

بدائل علاجيه: تتكون الأشكال البديلة للعلاج من عدم معالجة التراخي في الجبين ومنطقة الحاجب العلوي عن طريق جراحة رفع الحاجب .قد تتم محاولة تحسين تراخي الجلد وتجاعيد الجلد عن طريق العلاجات الأخرى أو الجراحة مثل التقشير بالليزر أو التقشير الكيميائي للوجه أو الحقن بالفيللر أو البوتكس.

❖ **مضاعفات خاصة بذلك الإجراء الجراحي:**

1. وجود تنميل وخدر بالجبهة بصورة مؤقتة حتى ستة أشهر عقب الجراحة.
2. إصابة العصب الوجهي مما قد يسبب ضعفا بعضلات الجبهة بصورة مؤقتة ممتدة لما بين ستة أشهر وعام عقب الجراحة.
3. نزيف تحت الجلد مما قد يؤثر على سلامة وحيوية الجلد.
4. تكدم وتورم بالوجه عقب الجراحة.
5. من الجائز الشعور بعدم الرضا من الشكل النهائي عقب الجراحة.
6. حدوث حساسية من أي من مكونات المواد المستخدمة في الجراحة.
7. تهيج العين: قد يحدث تهيج أو جفاف في العين بعد رفع الحاجب أو عندما يخضع المريض لجراحة في الجفن في نفس الوقت.
8. تساقط الشعر: قد يحدث تساقط الشعر في فروة الرأس أو الشقوق الجراحية. حدوث هذا لا يمكن التنبؤ به. قد يزول تساقط الشعر ببطء أو في حالات نادرة يكون دائمًا.
9. بعض التقنيات الجراحية تستخدم مسامير صغيرة أو خيوط عميقة دائمة أو أجهزة قابلة للذوبان للمساعدة في تعليق الحاجب.

الموافقة الخطية المستنيرة على اجراء عملية جراحية (جراحة رفع الحاجب)
(Brow Lift Surgery)

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

المقر بما فيه (الاسم ثلاثى): ..... ☐ذكر ☐ انثى السن : .....

الصـفـة : ☐المريض ☐ ولى الامر ☐ قريب ☐ أخرى .....

في حالة عدم توقيع المريض السبب ☐ قاصر ☐ قصور ذهنى ☐ غائب عن الوعى ☐ أخرى .....

التوقيع : ..... التاريخ : ..... الوقت : ..... رقم تحقيق الشخصية: .....

❖ الشاهد/ المترجم على توقيع المريض

الاسم : ..... التوقيع: ..... التاريخ: ..... الوقت: ..... الرقم القومى: .....

❖ نوع التخدير المستخدم اثنـــاء الجراحة ☐ تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ

الطبيب المعالج:

❖ أقر بأنني قد قمت بشرح طبيعة الإجراء الجراحي المقرر للمريض والبدائل العلاجية له والمضاعفات الوارد حدوثها، كما أعطيت له الفرصة لطرح كافة الأسئلة المتعلقة بذلك الإجراء وقمت بالإجابة عليها.

❖ كما أقر أن العملية الجراحية عاليه تهدف إلى علاج المريض عن طريق اجراء عملية جراحية تجميلية لعمل عمليه رفع الحاجب.

❖ كما أقر أنني قد قمت باتخاذ كافة الاحتياطات والفحوصات الطبية المعمول بها قبل إجراء هذا التداخل الجراحي من تحاليل طبية وأشعات مع إلزامي الكامل بمتابعة المريض بعد إجراء الجراحة وحتى تمام الشفاء.

المقر بما فيه:

الطبيب المعالج (الاسم الثلاثي): ..... التوقيع: ..... القسم التابع له: ..... التاريخ: ..... الوقت: .....

ملاحظات هامـــة:

- لا يسمح بإجراء أي تعديلات علي هذا النموذج بعد الانتهاء من تعبئته وإنما يستبدل بنموذج آخر جديد.
- يحتفظ المريض أو من ينوب عنه بنسخة من هذا الإقرار.

رقم تذكرة المريض	.....

Guidelines
For Hair Transplantation Surgery

For a Hair Transplantation Surgery to be Successful Three Major Prerequisites Should be Carefully Undertaken:

1- **Preoperative Evaluation & Consent.**
2- **Operative Set Up & Technique.**
3- **Post-Operative Care.**

1-Patient Evaluation Sheet

Clinical History

Name: .....

Sex: M/F .....

Date: .....

First manifestation of hair loss age: ..... Years: .....

Course of hair loss:

- Acute
- Chronic—Intermittent
- Chronic—Persistent

Complaining of increased shedding of hair:

- Moderate (40-100 hairs/day)
- Severe (>100 hairs/day)
- No shedding (<40 hairs/day)

Complaining of increased thinning of hair:

- Diffuse
- Localized Where: .....
- No Thinning

* Itching	:	.....	
* Dandruff	:	.....	Yes/No
* Family history of and rogenetic alopecia	:	.....	Yes/No
* If yes, side	:	.....	
* Mother/maternal side	:	.....	
* Father/paternal side	:	.....	
* Concomitant diseases (chronic, autoimmune, recent)	:	.....	Yes/No
* Previous surgery	:	.....	Yes/No
* Eating behavior	:	.....	
* Strictly vegetarian diet	:	.....	Yes/No
* Crash diet or eating behavior disorders	:	.....	Yes/No
* Important weight loss >5-10 kg	:	.....	Yes/No
* Drug history (e.g. proandrogenic, antithyroid, antiepileptics, b-blocker, chemotherapeutics, supplements)	:	.....	
* Please provide details	:	.....	
* Smoking	:	.....	Yes/No

Please select your area of concern:

Only in women:

Menstrual cycle: .....

Regular Menopause:.....Yes/No If yes, age at: .....

Oligomenorrhea: ..... Yes/No Amenorrhea: ..... Yes/No

Hormonal contraception: ..... Yes /No

What are your expectations of hair transplant?

.....

.....

.....

.....

.....

.....

.....

Any other concern?

.....
.....
.....
.....
.....
.....
.....

Name: .....
Date: .....
Age: .....

Clinical Examination

Hair density:

- Normal
- Decreased
- Pattern distribution
- Alopecic patches

Scalp skin:

- Normal
- Erythema
- Scaling
- Seborrhea
- Pustules
- Signs of scarring
- Others (e.g. psoriasis, pigmentation)

Eyebrows/eyelashes:

- Normal
- Abnormal

Facial and body hair:

- Normal
- Excessive hair growth/hirsutism
- Decreased axillary hair
- Decreased pubic hair

Signs of acne:

- Yes
- No

Hair examination tests:

- Pull test
- Videomicroscopy/loupe h
- Hair shaft examination
- Trichogram
- Biopsy

Laboratory:

- Iron, ferritin
- TSH
- Blood hemoglobin
- HBS Ag
- HCV
- HIV
- In women only, if hormonal dysregulation is suspected
- Total testosterone *(nmol 01)
- 100/SHBG (nmol L)1)] h
- DHEAS
- Prolactin

Consent for Hair Transplant Procedure

I, ... , do hereby grant consent for provides hair transplant clinic physician, and his assistants to perform hair transplantation procedure on me and any other medical services which during the procedure become medically reasonable and necessary. This includes, but is not limited to the administration of anesthetics and/ or sedatives necessary to perform a hair transplant procedure.

Hair transplantation is a surgical procedure by which hair from regions of the scalp that normally never goes bald (such as the sides and the lower back of the head) is transferred into areas of permanent hair loss. Careful planning is first utilized to design a hair line according to your wishes and following generally accepted guidelines. The recipient (bald) area is carefully evaluated and marked. Under local anesthesia, a strip of scalp containing healthy hair or bits of tissue with hair root is removed from donor areas on the back and sides. This donor area is enclosed with sutures (stitches) or heals spontaneously. The hair grafts are carefully prepared, trimmed, and then placed into the recipient sides made in the bald or thinning scalp. In most cases, grafts of various sizes are artistically placed in zones, in order to achieve the desired final appearance. Several sessions (usually 3 or 4, sometimes more) are generally necessary to complete a hair transplant project, the session being separated by a few months (9- 12 usually), to allow time for the blood vessel system to return to full strength and for new hair to grow. Future grafting session may be needed as balding progresses in the years to come.

I understand the procedure of hair transplantation is cosmetic in nature and that I have the option of doing nothing at all, wearing a hair piece, using medications. These options have been discussed with me.

I understand that there are risks involved in any surgical procedure or treatment and that it is not possible to guarantee or to give assurance of a successful results or to assure an outcome that will meet my goals. These documents describe the most common risks associated with the hair transplant surgery. Other risks, although rare, may exist. I recognize that I have been given opportunities to ask questions and I have made decision to go forward with the surgery. 1 clearly understand and agree to the planned surgical procedure. I have been told that hair transplantation is a generally safe procedure, however, I realize that the following are the possible events or complications that may occur:

- **Complication that occur occasionally:**
    - Swelling. Swelling may occasionally occur above the forehead, eyelids, and upper nose in some patients when transplants are placed in the front part of the scalp. Cool compressors and sitting postures are helpful. Such conditions may last about 1-3 days.
    - Epidermoid cysts: These are small sterile cysts which occur when a new graft has been accidentally placed "Piggy Back" on the top of a small amount of skin material which was trapped at the bottom of the new recipient hole. If they occur, they are simply treated with hot packs, and occasionally with a tiny incision under local anesthesia.
    - Mild shocking (shedding) of existing hair. When there is a "Weak" existing hair in the areas of the scalp that is trans-planted, occasionally the transplant procedure can have this mild "Shock Like" effect on those hairs, causing the "To Drop Out" for 3 months after which they are grown back, this effect, in general, is noticed in about one in ten patients, and is usually not an issue after the first session has grown in, since then there is a strong dominant hair over the area. If a particular hair that is "shocked" was on its last life cycle, then it may drop out permanently.
    - Temporary numbness: It is common for some portion of the top-rear area of the scalp to be partly numb for a few weeks after the surgery. It then gradually returns, almost all the way back to normal, during the next few months.
    - Minor and trivial side effects: itching in the area of the new graft or along the donor scar occasionally may occur.
- **Other possible complications that occur occasionally:**
    - Nausea and vomiting form pain medication
    - Temporary headache
    - Scarring around the grafts
    - Poor growth of grafts
    - Occasional small: ingrown hairs—causing a cyst – Bruising
    - Patient who smoke has a higher rate of delayed wound healing and lower graft heal. Smoking is not recommended for 2-3 weeks prior to and following the procedure.

- Complications that occur only rarely:
  - **Irregular or uneven or delayed hair growth**: Most transplanted hairs are shed after each session, over a period of 9-8 weeks. Generally, within 3-4 months, new hair growth begins. This may occur at irregular rates, with some hairs coarser, finer, darker, or lighter in color, or different in textures than the characteristics of the original hair. In most instances, this eventually normalizes. However, it may take 15 months or more from the starting point before cosmetically satisfactory results are seen.
  - **Discoloration of graft**: Redder, paler, or pigmented differently (light, dark, or mottled) than the surrounding scalp. In most instances, should this occur, it gradually becomes normal and same color as the surrounding skin.
  - **Elevation or depression of grafts**: Following healing, above or below the level of the surrounding skin, or uneven texture or blending. Both of these phenomena have been very rare in our practice.
  - Bleeding. Hematomas (collections of blood under the skin) are possible in the donor area, and rarely a graft site will ooze the first day or evening. 'These are both easily treated.
  - **Scarring**: Very occasionally specially in people with "Stretchy" skin. a donor scar will be somewhat wider than normal. Some persons form "keloids" when they heal, and we attempt to determine that each of our patient does not do this (by noting other past scars on their body).
  - **Dizziness or fainting**: Either form anxiety. not having eaten, or medications.
  - **Allergy or reaction to drugs used**: Medications are kept at hand to immediately treat any allergic reactions.
  - **Failure to improve my "Quality of Life'**: Interruption of work or job routine, or home or family or social life, or to live up to my goals or expectations form the procedure.
  - Folliculitis. Folliculitis is an uncommon problem in which hair follicles become infected with bacteria. Folliculitis usually appears in the postoperative period. The associated symptoms include redness around the grafts, pustules around emerging hairs and itching. There may be some associated loss of hair in the involved follicles, but since the problem is localized to individual hair follicles, the loss is rarely significant from cosmetic standpoint. The treatment of oral antibiotics that may be given for an extended period of time.
  - These grafts can incite an inflammatory reaction and may require removal at a later date through a small incision.
  - **Sun damage skin**: After your transplant, you must still protect your scalp from the damaging rays of the sun. Your new hair makes close observation of your scalp important because unusual new skin growths, or skin changes, may be more difficult to see. It is possible that significantly sun damaged skin may hinder hair growth.
  - **Infection**: The symptoms of infection include swelling, redness, tenderness, or pus at the surgical site and may be associated with fever or chills. If you experience any of these symptoms, contact us at once.
- **Other rare complications (partial list only)**:
  - Keloid formation
  - Complete failure of growth of transplanted hairs
  - Persistent scalp pain
  - Total loss of donor hair
  - Permanent numbness of the scalp
  - Noticeable scarring of donor area
  - Loss of transplanted hair.

I have been explained and I understand that hair transplantation today will not begin to grow until 3-4 months after the procedure. Before this time, small scabs will form around the grafts. The scabs will fall off in 7-10 days along with the shaft of the hair. This is normal. The roots remain behind. The new hair shaft will continue to grow underneath the skin. reaching the surface in 3-4 months. By around 10 months, the hair will mature and add density to the areas. It will take 12 months to actually see the result of the surgery since the hair grows at an average rate of 1.5 cm per month.

Provelus hair transplant has been informed that I, the patient, have had a prior hair transplant procedure performed by another company. Based on the evaluation of this prior work, Provelus does not agree with the results, including the design of the hairline, placement of the grafts, and other esthetics associated with a hair transplantation procedure. While provelus will make every attempt to make improvements and corrections on the past hair transplantation procedure, I do not hold provelus hair Transplant Center responsible for prior placement of grafts, design of prior hairline, or any other result associated with my prior hair transplant procedure performed by another company.

Driving caution: I am aware that I will be given medications during and after the surgical procedure that may cause drowsiness and/or impair my judgment. I understand that I will not operate a motor vehicle the day surgery or at any time while I am under the influence of these medication.

I believe that have been well-informed about hair transplant surgery. I understand o but the practices of medicine and surgery are not exact sciences. I understand knowledgeable practitioners sometime; disagree as to the best methods of treatment to achieve desired results.

It has been explained to me that the amount and location of future hair loss on the scalp, including the sides and back area cannot be predicted. I do understand it is possible to lose my existing hair at any point in the future. I do understand this may affect the appearance of the grafted area. I lair transplants may not be permanent. "I hey are usually very long lasting, but rarely have fallen out in 1-10 years.

There is a possibility of some temporary hair loss in the back of the scalp surrounding the area where the donor strip was removed. In rare cases, there may be permanent loss of hair adjacent to the surgical incision. In the transplanted area shedding of existing hair, called deluge effluvium, may occur after the surgery. If this hair is at the end of its normal life span, it may not return.

As with all surgical procedures, results cannot be guaranteed. It is possible that some or the all of the transplanted hair may fail to grow. Every effort will be made to give the maximum yield.

I understand the success of the hair transplant procedure is dependent upon my closely following all instructions. This includes, but is not limited to, preoperative and postoperative activities and precautions, which have been explained to me. I have also received a written copy of these instructions.

Initials .....

This consent was read and signed while I was not under the influence of medications, which cause drowsiness.
I certify this form has been read or it has been read to me, the blank spaces have been filled in, and I understand its contents.

I have disclosed all information regarding past and present medical conditions, current medications, and known drug allergies. This information is necessary so that the proper medical treatment is given at all times during the transplant procedure.

Signed: .....
(Patient) Date .....

.....
(Witness) Date .....

Physician declaration: I have explained the contents of this document, as well as related materials and instructions, t4 the patient, and have answered all of the patient's questions to the best of my knowledge. I feel that this patient has been adequately informed and has freely, openly, and fully consented to the procedure.

.....
(Physician's Signature)

Date:.....

.....

2-Operative Set Up & Technique

Who Does the Procedure?

- A Qualified Surgeon with Adequate Training on Hair Transplantation Procedures.
- A Trained Team of Doctors &/or Technicians.
- All Incisional Procedures Should be Done by Doctors.
- Technicians with Enough Training Can be Delegated to Prepare, Arrange and Implant Hair Grafts in Already Incised Recipient Sites by the Doctor.

Where to Perform Hair Transplantation?

- Licensed Location by Ministry of Health.
- Not Necessarily an Operating Theater, a clean Room with the Following Equipment's will suffice.
  - Operating Table or Chair.
  - Adequate Light Source.
  - Pulse Oximeter & ECG Monitor
  - Emergency Supplies:

- O_2
- Drugs
- Umbo Bag

➢ **Preoperative Prep.**

- **Discuss Operative Plan with the Patient;**
  Either Follicular Units Excision (FUE) Commonest
  Or Follicular Transplantation (FUT) Rarely Done

- **Exclude Patients with:**
  Unrealistic Expectations.
  Chronic Illness & Bad General Health. Uncontrolled Hypertension or Diabetes.

- **Drugs to Stop**
  Anticoagulants Blood
  Thinners Antidepressants
  Smoking & Alcohols

- **Consult Internist if in Doupt**
- **Drugs to Give**
  Oral Sedation (Night before Operation and 15 minutes Before the Procedure) Perioperative Antibiotics

- **Take Standard Photos**
- **Anesthesia**
  Either Nerve Block or Regional Block Lidocain 1% Maximal Dose 7mg /kg =56ml Bupivacaine 0.25% Maximal Dose 225mg =90ml Epinephrine 1/100.000 Maximal Dose 2.5mg

➢ **Complications of Anesthesia:**

Vasovagal Reaction "Commonest "Pallor, Sweating >>>>> Faintness & Loss of Consciousness
What to Do: Stop Injection Trendelenberg Position Atropine 1 M

- **Systemic Toxicity**

Suspicion: Perioral Numbness & Copper Taste
Tremors, Visual Disturbances, Seizers, Coma >>>>>Respiratory Arrest & CV Collapse

Action: Be Ware
Trendelanberlg Position
Oxygen
I.V. Fluids & Diazepam

Instruments:

For FUE:

- At Least 2 Motors
- Punches 0.8 – 1.0 mm
- Coolers with Proper Holding Solutions
- Implanters

For FUT:

- Surgical Set
- Stereomicroscope
- Coolers with Proper Holding Solutions

- Implant

الموافقة الخطية المستنيرة على جراحة زرع الشعر
Hair Transplantation

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

المريض:

أقر أنا الموقع أدناه أنني موافقة على إجراء التدخل الجراحي المبين عاليه، وأقر أن الطبيب قد قام بشرح طبيعة ذلك التداخل الجراحي والهدف منه، كما أوضح البدائل المتاحة لهذا الإجراء الجراحي. كما أقر أنني على كامل المعرفة بالمضاعفات الطبية والجراحية ممكنة الحدوث من جرّاء تلك العملية.

❖ **معلومات عامه:**

- زرع الشعر هو إجراء جراحي بسيط يتم من خلاله نقل الشعر الدائم من مناطق فروة الرأس التي لا تصبح صلعاء عادةً، مثل الجوانب وخلف الرأس، أو إعادة توزيعها في مناطق تساقط الشعر الدائم أو ترققه .يتم استخدام التخدير الموضعي ويكون المرضى على دراية كاملة ويمكنهم التحدث مع الفريق الجراحي أثناء العملية .يتم تقييم وتمييز منطقة الصلع بعناية .باستخدام التخدير الموضعي، تتم إزالة جزء من فروة الرأس يحتوي على شعر صحي من المناطق المانحة، بشكل عام في شريط ضيق طويل .ثم يتم إغلاق هذه المنطقة المانحة بالغرز . هذا قد يترك ندبة شاحبة وناعمة يمكن تغطيتها بسهولة من قبل شعر المريض، تتم إزالة "الغرز "عادة بعد 10-7أيام . يوجد طريقه اخري وهي الإقتطاف وتترك فتحات صغيره جدا تلتئم في خلال اسبوع ولا تترك ندبات طويله.
- قد تكون هناك حاجة لجلسات أخري مستقبلية مع تقدم الصلع في السنوات القادمة .من الصعب التنبؤ بالنمط الفعلي وسرعة التساقط او الصلع في أي شخص. كما لا يوجد ضمان كامل بالنتائج.
- يتساقط الشعر الصغير الذي يُزرع في غضون الأسابيع 4-3 الأولى .سوف ينمو الشعر الجديد بعد ذلك من جذر الشعر وسيكون ملحوظًا بحلول 4أشهر تقريبًا ويستمر في النمو بسرعة ومعدل طول الشعر الطبيعي، عادة حوالي 1سم في الشهر .يتم إجراء فحص ما بعد الجراحة بعد ستة أشهر ويتم عادةً تقييم النتيجة النهائية للجراحة بعد 18 شهرًا عندما يكون الشعر قد نما بالكامل.

بدائل علاجيه: هناك طرق بديلة أخرى لمعالجة تساقط الشعر، وتشمل هذه البدائل عدم القيام بأي شيء، أو ارتداء قطعة شعر أو شعر مستعار أو باروكة، وعوامل نمو الشعر الموضعية والمحفزات مثل المينوكسيديل .ترتبط المخاطر والمضاعفات المحتملة أيضًا بالأشكال الجراحية البديلة للعلاج.

الموافقة الخطية المستنيرة على جراحة زرع الشعر
Hair Transplantation

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

❖ مضاعفات خاصة بذلك الإجراء الجراحي:

1. تورم بالجبهة.
2. عندما يكون هناك شعر ضعيف موجود في مناطق فروة الرأس التي يتم زرعها، يمكن أن يكون لعملية الزرع في بعض الأحيان تأثير "يشبه الصدمة "المعتدل على تلك الشعيرات، مما يتسبب في تساقطها لمدة 3أشهر، وبعد ذلك تنمو مرة أخرى.
3. خدر مؤقت او عدم احساس في جزء من الرأس.
4. من الجائز الشعور بعدم الرضا من الشكل النهائي عقب الجراحة.
5. حدوث حساسية من أي من مكونات المواد المستخدمة في الجراحة.
6. على الرغم من توقع نتائج جيدة، لا يوجد ضمان صريح أو ضمني، على النتائج التي يمكن الحصول عليها.
7. نمو الشعر غير المنتظم أو تأخر نمو الشعر.
8. الكيسات الحويصلية :وهي تكيسات معقمة صغيرة تحت الجلد.
9. ارتفاع أو انخفاض الشعر المزروع :بعد الشفاء، يمكن أن يستقر الشعر المزروع فوق أو تحت مستوى الجلد المحيط، أو يكون لها نسيج غير متساوٍ . هاتان الظاهرتان نادرتين جدًا.

المقر بما فيه (الاسم ثلاثى): ..... ☐ ذكر ☐ انثى السن : .....

الصفة : ☐ المريض ☐ ولى الامر ☐ قريب ☐ أخرى .....

في حالة عدم توقيع المريض السبب ☐ قاصر ☐ قصور ذهنى ☐ غائب عن الوعى ☐ أخرى .....

التوقيع : ..... التاريخ : ..... الوقت : ..... رقم تحقيق الشخصية: .....

❖ نوع التخدير المستخدم اثنـــاء الجراحة ☐ تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ

الموافقة الخطية المستنيرة على جراحة زرع الشعر
Hair Transplantation

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الطبيب المعالج:

- أقر بأنني قد قمت بشرح طبيعة الإجراء الجراحي المقرر للمريضة والبدائل العلاجية لها والمضاعفات الوارد حدوثها، كما أعطيت لها الفرصة لطرح كافة الأسئلة المتعلقة بذلك الإجراء وقمت بالإجابة عليها.
- كما أقر أن العملية الجراحية عالية تهدف إلى علاج المريضة عن طريق اجراء عملية جراحية تجميلية لزراعه الشعر.
- كما أقر أنني قد قمت باتخاذ كافة الاحتياطات والفحوصات الطبية المعمول بها قبل إجراء هذا التداخل الجراحي من تحاليل طبية وأشعات مع التزامي الكامل بمتابعة المريضة بعد إجراء الجراحة وحتى تمام الشفاء.

المقر بما فيه:

الطبيب المعالج (الاسم الثلاثي): ..... التوقيع: ..... القسم التابع له: ..... التاريخ: ..... الوقت: .....

- **الشاهد/ المترجم على توقيع المريض**

الاسم : ..... التوقيع: ..... التاريخ: ..... الوقت: ..... الرقم القومى: .....

ملاحظات هامـــة:

- لا يسمح بإجراء أي تعديلات علي هذا النموذج بعد الانتهاء من تعبئته وإنما يستبدل بنموذج آخر جديد.
- يحتفظ المريض أو من ينوب عنه بنسخة من هذا الإقرار.

رقم تذكرة المريض	.....

Guidelines of Breast Aesthetic

The breasts are a uniquely feminine body feature. Women who are confident about the appearance of their breasts often have a positive self-image.

Breast enhancement surgery can help women have the breast size and shape they desire. Plastic surgery can also be helpful to men who want a more masculine chest.

Procedures Include:

The Patient Safety Diamond, designates four factors that are required for safe practice:

- **Procedure**: appropriate for the patient
- **Patient**: a good candidate for the procedure, well prepared, properly followed during & after the procedure.
- **Surgeon**: qualified and experienced in performing the procedure. Member of ESPRS. MD or Board certified
- **Surgical setting**: safe with trained personnel and emergency procedures in place. ISAPS safety measures are included.

By ensuring that all four of these criteria are met, safety optimization and hence the success of the procedure could be obtained.

Reduction mammoplasty "Augmentation mammoplasty "
Breast lifting (biological or synthetic) Gynecomastia

Revision breast surgery
Age restrictions: from 18 years old
BMI restrictions: we recommend BMI <33
Detailed history and breast examination should be done and documented.

Augmentation mammoplasty

Investigations: routine pre-operative investigations in addition to mammogram for patients above 35 years or with relevant history for malignant predisposition.

- Preoperative standard photography.
- VTE prophylaxis should be considered according to international guidelines.
- Smoking should be stopped one month before the operation
- It is a major operation, should be done in a fully equipped hospital
- The excised tissue should be weighed after the operation and should be documented.
- Compression garment is recommended postoperative.
- The excised breast tissue should be examined histo-pathologically for any pathological changes.
- Hospital post-operative stay should be one night at least
- Follow up visits should be done after 1 week, 2 weeks, 1 month, 3 months, 6 months then yearly.
- Post-operative photos should be taken every visit
- Full documentation of pre, intra, and post-operative data
- Age restrictions: starting from 18 years old
- BMI restrictions: we recommend BMI <33

- Detailed history and breast examination should be done and documented
- Investigations: routine pre-operative investigations in addition to mammogram for patients above 35 years or with relevant history for malignant predisposition
- Preoperative standard photography.
- VTE prophylaxis should be considered according to guidelines.
- It is not a major operation, so can be done in one day care center or a hospital. Both should be fully equipped. The silicon implant
- should be smooth, volume better not to exceed 350 cc. implant full data should be plastered to patient filing system.

Breast lift:

- Compression garment is recommended postoperative.
- Hospital post-operative stay should be six hours at least.
- Follow up visits should be done after 1 week, 2 weeks, 1 month, 3 months, 6 months then yearly.
- Post-operative photos should be taken every visit
- Full documentation of pre, intra, and post-operative data
- Age restrictions: Starting from 18 years old.
- BMI restrictions: We recommend BMI <33.
- Detailed history and breast examination should be done and documented.
- Investigations: routine pre-operative investigations in addition to mammogram for patients above 35 years or with relevant history for malignant predisposition
- Preoperative standard photography.
- VTE prophylaxis should be considered according to guidelines. Smoking should be stopped one month before the operation
- It is a major operation (> one hour), should be done in a fully equipped hospital
- The excised tissues if present should be weighed after the operation and should be documented.
- The silicone implant if inserted should be smooth, better to be medium or low profile with volume doesn't exceed 350 cc. The implant full data should be plastered to patient filing system Compression garment is recommended.
- Hospital post-operative stay should be one night at least
- Follow up visits should be done after 1 week, 2 weeks, 1 month, 3 months, 6 months then yearly.
- Post-operative photos should be taken every visit.
- Full documentation of pre, intra, and post-operative data

Guidelines of Body Contouring

Body Contouring surgery is a multitude of surgical procedures that follow massive weight loss obese patients achieved by either surgical obesity procedures (sleeve, diversions, etc) or by diet and exercise programs.

Guidelines:

I. Patients should be at least 18 years of age or above and rarely to consider younger age groups.
II. **Patients should be categorized into:**
    1. Patients with weight loss by surgical procedure to be operated upon after one year of stable weight loss.
    2. Patients with diet and exercise can be operated upon after 6 months of stable weight.
III. Surgical procedures should be addressed by patient complaint and discussed with patient and family.
IV. Surgical time should be managed within 4-6 hours according to the patient general conditions, surgery team capabilities and hospital setup.
V. Combination of surgical procedures should be reasonably arranged and discussed with anaesthesia and nursing staff in order to limit errors during work.
VI. Types of anaesthesia with general and regional or local should be thoroughly discussed with anaesthesiologist to ensure availability of all required drugs and instruments.
VII. The major surgical procedures like abdominoplasty, belt lipectomy, breast reduction or lift, thigh lift, large volume liposuction and combination of these procedures should be performed by consultants of plastic surgery who have obtained an MD or National Fellowship Certificate in plastic surgery.
VIII. Accreditation of hospitals and operating rooms.
We are looking forward for a National accredited system to ensure the safety and efficiency of our institutions.
IX. Staging of multiple procedures is a safe procedure since each group should be limited to a 4-6 hours operative time.
X. Report of complications and dealing with it should be registered as in many cases neglecting of this can be a problem.

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقة الخطية المستنيرة على اجراء عملية جراحية لتنسيق القوام بعد جراحات السمنة المفرطة

Body Contouring Procedures in the Massive Weight Loss Patient– body lift

المريض:

أقر أنا الموقع أدناه أنني موافق على إجراء التداخل الجراحي المبين عاليه، وأقر أن الطبيب قد قام بشرح طبيعة ذلك التداخل الجراحي والهدف منه، كما أوضح البدائل المتاحة لهذا الإجراء الجراحي. كما أقر أنني على كامل المعرفة بالمضاعفات الطبية والجراحية ممكنة الحدوث من جرّاء تلك العملية.

❖ **معلومات عامه:**

1. شد الجسم هو إجراء جراحي لإزالة الجلد الزائد والأنسجة الدهنية من البطن الوسطى والسفلية والوركين والفخذين الخارجيين والظهر والأرداف وشد عضلات جدار البطن. رفع الجسم ليس علاجًا جراحيًا لزيادة الوزن. يجب على الأشخاص الذين يعانون من السمنة المفرطة الذين ينوون إنقاص وزنهم تأجيل جميع أشكال جراحة تنسيق القوام حتى يصلوا إلى وزن مستقر.
2. هناك مجموعة متنوعة من التقنيات المختلفة التي يستخدمها جراحي التجميل لرفع وشد الجسم. يمكن دمج شد الجسم مع أشكال أخرى من جراحة تنسيق القوام، بما في ذلك استئصال الدهون بمساعدة تقنيات الشفط، أو إجراؤه في نفس الوقت مع جراحات اختيارية أخرى.
3. لابد من وجود جروح وندبات تختلف شكلها وطولها وموضعها من حاله الي أخري يتم مناقشتها مع الجراح حسب حالتك واحتياجاتك.
4. قد تحتاج الي جراحات اخري لاحقا لشد الجلد والنتيجة ليست دائمة.
5. قد تتم الجراحة على مرحله واحدة او عدة مراحل.

drains: استخدام الدرنقه الجراحية التصريف عبارة عن أنبوب صغير يقوم بتصريف السوائل .أثناء الجراحة، قد يجد طبيبك أنه من الضروري وضع مُصرف ستتم إزالته عندما يشعر .قد يتطلب وضعه شقًا صغيرًا منفصلاً .سيتم إرشادك حول استخدام المصرف الخاص بك .من المنطقة التي تم إجراء العملية عليها .طبيبك أنه لم يعد ضروريًا

بدائل علاجيه: تتكون الأشكال البديلة للعلاج من عدم معالجة مناطق الجلد المترهل والتكتلات الدهنية .قد يكون شفط الدهون بديلاً جراحيًا لرفع الجسم إذا كانت مرونة البشرة جيده ويوجد تجمعات دهنية موضعية في البطن لدى الفرد ذي الوزن الطبيعي .برامج النظام الغذائي وممارسة الرياضة قد تكون مفيدة في الحد من الدهون الزائدة في الجسم وتحسين القوام .ترتبط المخاطر والمضاعفات المحتملة أيضًا بالأشكال الجراحية البديلة للعلاج.

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقة الخطية المستنيرة على اجراء عملية جراحية لتنسيق القوام بعد جراحات السمنة المفرطة

Body Contouring Procedures in the Massive Weight Loss Patient-body lift

الطبيب المعالج:

- أقر بأنني قد قمت بشرح طبيعة الإجراء الجراحي المقرر للمريض والبدائل العلاجية له والمضاعفات الوارد حدوثها، كما أعطيت له الفرصة لطرح كافة الأسئلة المتعلقة بذلك الإجراء وقمت بالإجابة عليها.
- كما أقر أن العملية الجراحية عالية تهدف إلى علاج المريض عن طريق شد الجسم وتنيق القوام بعد عمليات السمنة المفرطة.
- كما أقر أنني قد قمت باتخاذ كافة الاحتياطات والفحوصات الطبية المعمول بها قبل إجراء هذا التداخل الجراحي من تحاليل طبية وأشعات مع التزامي الكامل بمتابعة المريض بعد إجراء الجراحة وحتى تمام الشفاء.

- نوع التخدير المستخدم اثنـــاء الجراحة ☐ تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ

المقر بما فيه:

الطبيب المعالج (الاسم الثلاثي): ..... التوقيع: ..... القسم التابع له: ..... التاريخ: ..... الوقت: .....

- الشاهد/ المترجم على توقيع المريض

الاسم : ..... التوقيع: ..... التاريخ: ..... الوقت: ..... الرقم القومى: .....

ملاحظات هامـــة:

- لا يسمح بإجراء أي تعديلات على هذا النموذج بعد الانتهاء من تعبئته وإنما يستبدل بنموذج آخر جديد.
- يحتفظ المريض أو من ينوب عنه بنسخة من هذا الإقرار.

رقم تذكرة المريض	.....

النموذج المعتمد من الجمعية المصرية لجراحى التجميل والاصلاح

الموافقة الخطية المستنيرة على اجراء عملية جراحية لشد البطن

Abdominoplasty Surgery

المريض:

أقر أنا الموقع أدناه أنني موافق على إجراء التداخل الجراحي المبين عاليه، وأقر أن الطبيب قد قام بشرح طبيعة ذلك التداخل الجراحي والهدف منه، كما أوضح البدائل المتاحة لهذا الإجراء الجراحي. كما أقر أنني على كامل المعرفة بالمضاعفات الطبية والجراحية ممكنة الحدوث من جرّاء تلك العملية.

❖ **معلومات عامه:**

1. هو إجـراء جراحي لإزالة الجلد الزائد والأنسجة الدهنية من أسفل البطن .لا تعد جراحة شد البطن علاجًا لزيادة الوزن. الأشخاص الذين يعانون من السمنة المفرطة الذين ينوون إنقاص الوزن، يجب تأجيل جميع أشكال جراحة تنسيق القوام، حتى تصل إلى وزن ثابت .هناك مجموعة متنوعة من التقنيات المختلفة المستخدمة من قبل جراحي التجميل لاستئصال وشفط الدهون ويمكن الجمع بين الجراحات الأخرى من جراحات تنسيق القوام .تشتمل جراحة شد البطن أو جراحة تنسيق القوام على ازاله الأنسجة الزائدة تاركه ندوب بالبطن، المخطط لها والمتفق عليها حسب احتياجاتك ولا تختفي أثارها نهائيا ولكنها تتحسن مع مرور الوقت والعلاجات الموضعية، يتم ايضا تصحيح وشد عضلات البطن أو غيرها من التدخلات التي تحتاجها اثناء الجراحة .ايضا في بعض الحالات، يتم تعديل موضع السرة ويكون حولها ندبه جراحية وفي بعض الحالات التي يصاحبها فتاق، قد يستلزم إزالتها.
2. علي علم بالخطوات من الفتح الجراحي والخيوط الجراحية وخطوات الجراحة. كما أنني أتعهد بالالتزام بتوصيات الطبيب من ضرورة لبس المشد بعد الجراحة. وفى حالة إخلالي بمتابعة أوامر الطبيب فأن الطبيب والفريق الطبي المساعد له غير مسئولين عن نتيجة الجراحة.
3. النتـائج طويلة المدى: قد تحدث تغيرات لاحقة في شكل البطن نتيجة الشيخوخة، والتعرض لأشعة الشمس، فقدان الوزن أو زيادة الوزن أو الحمل أو انقطاع الطمث أو ظروف أخرى لا تتعلق بالجراحة.
4. استخدام الدرنقه الجراحية :drainsأثناء الجراحة، قد يجد طبيبك أنه من الضروري وضع مُصرف .وهو عبارة عن أنبوب صغير يقوم بتصريف السوائل من المنطقة التي تم إجراء العملية عليها .سيتم إرشادك حول استخدام المصرف الخاص بك .قد يتطلب وضعه شقًا صغيرًا منفصلاً .ستتم إزالته عندما يشعر طبيبك أنه لم يَعُد ضروريًا.

بدائل علاجيه: هي عمليه اختيارية، تتكون البدائل من عدم معالجة مناطق الجلد المترهل والتكتلات الدهنية. شفط الدهون قد يكون بديلاً جراحيًا، ولكن عادة لن يساعد في إزالة الترهلات، ضعف العضلات، والجلد المتدلي. قد تكون برامج الحمية والتمارين مفيدة في خفض الدهون الزائدة في الجسم بشكل عام.

❖ **مضاعفات خاصة بذلك الإجراء الجراحي:**

1. (تجمع سيرومى) seromaنادرًا ما تتراكم السوائل بين الجلد والأنسجة الكامنة بعد الجراحة. في حالة حدوث هذه المشكلة، قد تتطلب إجراءات إضافية لتصريف السوائل.
2. فقد بالإحساس العصبي بالجلد موضع الجراحة.
3. عدم انتظام سطح وشكل ولون الجلد موضع الجراحة، وعدم تماثل الشكل على جانبي البطن عقب الجراحة.
4. عدم التئام الجرح بالجلد موضع الجراحة مما قد يتطلب جراحة أخرى.
5. حدوث تشوه أو تغيير بموضع السرة.
6. على الرغم من توقع نتائج جيدة، لا يوجد ضمان صريح أو ضمني، على النتائج التي يمكن الحصول عليها.
7. مشاكل التئام الجروح: بعض الحالات الطبية والمكملات الغذائية والأدوية قد تؤخر وتتداخل مع الإلتئام. المدخنون أكثر عرضة لخطر فقدان الجلد ومضاعفات التئام الجروح.
8. حدوث تشوه أو تغير بشكل وسطح الجلد المغطى للعانة والأجزاء التناسلية الخارجية لدى النساء مما قد يستلزم عمليات جراحية أخرى.
9. وجود تحجر بالأنسجة والدهون أسفل موضع الجراحة.

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقة الخطية المستنيرة على اجراء عملية جراحية لشد البطن
Abdominoplasty Surgery

المقر بما فيه (الاسم ثلاثى): ..... ☐ ذكر ☐ انثى السن : .....

الصـفـة : ☐ المريض ☐ ولى الامر ☐ قريب ☐ أخرى .....

في حالة عدم توقيع المريض السبب ☐ قاصر ☐ قصور ذهنى ☐ غائب عن الوعى ☐ أخرى .....

التوقيع : ..... التاريخ : ..... الوقت : ..... رقم تحقيق الشخصية: .....

الطبيب المعالج:

- أقر بأنني قد قمت بشرح طبيعة الإجراء الجراحي المقرر للمريض والبدائل العلاجية له والمضاعفات الوارد حدوثها، كما أعطيت له الفرصة لطرح كافة الأسئلة المتعلقة بذلك الإجراء وقمت بالإجابة عليها.
- كما أقر أن العملية الجراحية عالية تهدف إلى علاج المريض عن طريق شد البطن.
- كما أقر أنني قد قمت باتخاذ كافة الاحتياطات والفحوصات الطبية المعمول بها قبل إجراء هذا التداخل الجراحي من تحاليل طبية وأشعات مع التزامي الكامل بمتابعة المريض بعد إجراء الجراحة وحتى تمام الشفاء.

- نوع التخدير المستخدم اثنـــاء الجراحة ☐ تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ

المقر بما فيه:

الطبيب المعالج (الاسم الثلاثي): ..... التوقيع: ..... القسم التابع له: ..... التاريخ: ..... الوقت: .....

- الشاهد/ المترجم على توقيع المريض

الاسم : ..... التوقيع: ..... التاريخ: ..... الوقت: ..... الرقم القومى: .....

ملاحظات هامـــة:

- لا يسمح بإجراء أي تعديلات علي هذا النموذج بعد الانتهاء من تعبئته وإنما يستبدل بنموذج آخر جديد.
- يحتفظ المريض أو من ينوب عنه بنسخة من هذا الإقرار.

رقم تذكرة المريض	.....

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقة الخطية المستنيرة على اجراء عملية جراحية لتنسيق القوام لشد الذراعين
Arm lift–Brachioplasty

المريض:
أقر أنا الموقع أدناه أنني موافق على إجراء التداخل الجراحي المبين عاليه، وأقر أن الطبيب قد قام بشرح طبيعة ذلك التداخل الجراحي والهدف منه، كما أوضح البدائل المتاحة لهذا الإجراء الجراحي. كما أقر أنني على كامل المعرفة بالمضاعفات الطبية والجراحية ممكنة الحدوث من جرّاء تلك العملية.

❖ **معلومات عامه:**

-عملية شد الذراع هي عملية جراحية تُستخدم للمساعدة في إزالة الجلد الزائد والأنسجة الدهنية من الإبط والجزء العلوي من الذراع .وهذا ليس علاجًا جراحيًا لزيادة الوزن .يجب على الأشخاص الذين يعانون من السمنة المفرطة الذين ينوون إنقاص وزنهم تأجيل جميع أشكال جراحة تنسيق القوام حتى يصلوا إلى وزن ثابت.

-هناك مجموعة متنوعة من التقنيات المختلفة التي يستخدمها جراحو التجميل .يمكن دمج رفع الذراع مع عمليات أخري، بما في ذلك استئصال الدهون بمساعدة الشفط، أو جراحات اختيارية أخرى.

-هناك أكثر من شكل للجرح الخاص بالعملية قد يكون بطول الذراع أو تحت الابط وقد يمتد الي الساعد او الصدر في بعض حالات ما بعد عمليات السمنة المفرطة وينتج عنه أثار ندبات لا تختفي نهائيا ويتحسن أثارها مع مرور الوقت والعلاجات الموضعية.

-استخدام الدرنقه الجراحية :drainsأثناء الجراحة، قد يجد طبيبك أنه من الضروري وضع مُصرف .التصريف عبارة عن أنبوب صغير يقوم بتصريف السوائل من المنطقة التي تم إجراء العملية عليها .سيتم إرشادك حول استخدام المصرف الخاص بك .قد يتطلب وضعه شقًا صغيرًا منفصلاً .ستتم إزالته عندما يشعر طبيبك أنه لم يعد ضروريًا.

بدائل علاجيه:شد او رفع الذراع هي عملية جراحية اختيارية .تتكون الخيارات الأخرى من عدم معالجة مناطق الجلد المترهل بالجراحة .قد تكون جراحة شفط الدهون بديلاً جراحيًا إذا كانت مرونه الجلد جيده ولا توجد به تشققات وتكتل الدهون موضعي لفرد فى الوزن الطبيعي .قد تكون نظم الحمية والتمارين الرياضية مفيدة في الحد من الدهون الزائدة في الجسم .ترتبط المخاطر والمضاعفات المحتملة أيضًا بالأشكال الجراحية البديلة للعلاج.

الموافقة الخطية المستنيرة على اجراء عملية جراحية لتنسيق القوام لشد الذراعين

Arm lift–Brachioplasty

❖ **مضاعفات خاصة بذلك الإجراء الجراحي:**

1. فقد الإحساس بالجلد موضع الجراحة: من الشائع أن تعاني من نقص) أو فقدان (إحساس الجلد في المناطق التي خضعت لعملية جراحية) أعلى الذراع، الإبط .(من النادر أن تحدث تغيرات دائمة في الإحساس في اليدين والذراعين بعد، ولكن هذا ممكن .هناك خطر ضئيل لإصابة الأعصاب الحركية التي قد تؤدي إلى ضعف وظيفة الطرف العلوي / اليد.
2. تحدث الكدمات والتورم عادة.
3. الإحساس بضيق الذراع مؤقتا.
4. قد يحدث ألم متفاوت الشدة ويستمر بعد الجراحة لايام وقد يحدث الألم المزمن بشكل غير متكرر للغاية نتيجه محاصره الأعصاب بالأنسجة الندبية (neuroma) أو بسبب الالتصاق بالندبات.
5. الندبات: جميع العمليات تترك ندبات، بعضها أكثر وضوحا من البعض الآخر. على الرغم من التئام الجروح بشكل جيد بعد الجراحة، قد تحدث ندوب غير طبيعية داخل الجلد والأنسجة العميقة. قد تكون الندوب غير جذابة ولونها مختلف عن لون البشرة المحيطة. قد يختلف مظهر الندبة في نفس الندبة. قد تكون الندوب غير متماثلة (تظهر مختلفة على الجانب الأيمن والأيسر من الجسم). وهناك إمكانية وجود علامات واضحة في الجلد من الغرز. في بعض الحالات، قد تتطلب الندوب مراجعة جراحية أو علاجيه.
6. قد يحدث إعادة ترهل الجلد بمرور الوقت .و هذا بسبب استجابة الجسم المتأصلة للتمدد .المرضى الذين فقدوا كميات كبيرة من الوزن عرضة لهذه الظاهرة .
7. الغرز قد تخترق الجلد تلقائيًا أو تصبح مرئيًا أو تسبب تهيجًا يتطلب إزالة الغرز.
8. عدم انتظام سطح وشكل ولون الجلد موضع الجراحة، وعدم تماثل الشكل الذراعين.
9. عدم التئام الجرح بالجلد موضع الجراحة مما قد يتطلب جراحة أخرى.
10. تجمع السوائل seroma: نادرًا ما تتراكم السوائل بين الجلد والأنسجة الكامنة بعد الجراحة. في حالة حدوث هذه المشكلة، قد تتطلب إجراءات إضافية لتصريف السوائل. على الرغم من توقع نتائج جيدة، لا يوجد ضمان صريح أو ضمني، على النتائج التي يمكن الحصول عليها.
11. مشاكل التئام الجروح: بعض الحالات الطبية والمكملات الغذائية والأدوية قد تؤخر وتتداخل مع الالتئام. المدخنون أكثر عرضة لخطر فقدان الجلد ومضاعفات التئام الجروح.
12. وجود تحجر بالأنسجة والدهون أسفل موضع الجراحة.
13. قد تجد قطعة من الدهون طريقها إلى مجرى الدم، نادره الحدوث وتؤدي إلى حالة خطيرة أو تهدد الحياة والسكتة الدماغية، والتهاب السحايا (التهاب الدماغ)، عدوى خطيرة، العمى أو فقدان الرؤية، أو الموت.
14. نخر الدهون: الأنسجة الدهنية الموجودة في عمق الجلد قد تموت. قد ينتج عن ذلك مناطق متماسكة داخل الجلد. قد يكون من الضروري إجراء جراحة إضافية لإزالة مناطق نخر الدهون.

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقة الخطية المستنيرة على اجراء عملية جراحية لتنسيق القوام لشد الذراعين

Arm lift–Brachioplasty

المقر بما فيه (الاسم ثلاثى): ..... ☐ ذكر ☐ انثى السن : .....

الصفة : ☐ المريض ☐ ولى الامر ☐ قريب ☐ أخرى .....

في حالة عدم توقيع المريض السبب ☐ قاصر ☐ قصور ذهنى ☐ غائب عن الوعى ☐ أخرى .....

التوقيع : ..... التاريخ : ..... الوقت : ..... رقم تحقيق الشخصية: .....

❖ نوع التخدير المستخدم اثنـــاء الجراحة ☐ تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ

الطبيب المعالج:

- أقر بأنني قد قمت بشرح طبيعة الإجراء الجراحي المقرر للمريض والبدائل العلاجية له والمضاعفات الوارد حدوثها، كما أعطيت له الفرصة لطرح كافة الأسئلة المتعلقة بذلك الإجراء وقمت بالإجابة عليها.
- كما أقر أن العملية الجراحية عالية تهدف إلى علاج المريض عن طريق شد الذراعين.
- كما أقر أنني قد قمت باتخاذ كافة الاحتياطات والفحوصات الطبية المعمول بها قبل إجراء هذا التداخل الجراحي من تحاليل طبية وأشعات مع التزامي الكامل بمتابعة المريض بعد إجراء الجراحة وحتى تمام الشفاء.

المقر بما فيه:

الطبيب المعالج (الاسم الثلاثي): ..... التوقيع: ..... القسم التابع له: ..... التاريخ: ..... الوقت: .....

❖ الشاهد/ المترجم على توقيع المريض

الاسم : ..... التوقيع: ..... التاريخ: ..... الوقت: ..... الرقم القومى: .....

ملاحظات هامـــة:

- لا يسمح بإجراء أي تعديلات علي هذا النموذج بعد الانتهاء من تعبئته وإنما يستبدل بنموذج آخر جديد.
- يحتفظ المريض أو من ينوب عنه بنسخة من هذا الإقرار.

رقم تذكرة المريض .....

الموافقة الخطية المستنيرة على اجراء عملية جراحية لتنسيق القوام لشد الفخذين
Medial Thigh Lift

نموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

المريض:

أقر أنا الموقع أدناه أنني موافق على إجراء التدخل الجراحي المبين عاليه، وأقر أن الطبيب قد قام بشرح طبيعة ذلك التدخل الجراحي والهدف منه، كما أوضح البدائل المتاحة لهذا الإجراء الجراحي. كما أقر أنني على كامل المعرفة بالمضاعفات الطبية والجراحية ممكنة الحدوث من جرّاء تلك العملية.

❖ **معلومات عامه:**

1. شد الفخذ هو إجراء جراحي لإزالة الجلد الزائد والأنسجة الدهنية من الفخذين .شد الفخذ ليس علاجًا جراحيًا لزيادة الوزن .يجب على الأشخاص الذين يعانون من السمنة المفرطة الذين ينوون إنقاص وزنهم تأجيل جميع أشكال جراحة تنسيق القوام حتى يصلوا إلى وزن مستقر.
2. هناك مجموعة متنوعة من التقنيات المختلفة التي يستخدمها جراحي التجميل لشد الفخذ من الداخل .يمكن دمج شد الفخذ مع أشكال أخرى من جراحة تنسيق القوام، بما في ذلك استنصال الدهون بمساعدة تقنيه الشفط، أو إجراؤه في نفس الوقت مع جراحات اختيارية أخرى .قد تتطلب الجراحة نقل منتجات الدم؛ ومع ذلك، يختلف هذا على أساس كل حالة على حدة.
3. يوجد جروح وندبات تختلف شكلها وطولها وموضعها من حاله الي أخري، قد تكون بطول الفخذ من الداخل أو تمتد ما بين الفخذ والبطن وتصل الي أسفل الارداف. ويتم مناقشتها مع الجراح حسب حالتك واحتياجاتك.
4. قد تحتاج الي جراحات اخري لشد الجلد والنتيجة ليست دائمة.
5. قد تتم الجراحة على مرحله واحدة او عدة مراحل.

❖ **مضاعفات خاصة بذلك الإجراء الجراحي:**

1. فقد بالإحساس بالجلد موضع الجراحة قد تمتد لشهور.
2. قد تلاحظ بعض الغرز بعد الجراحة. الغرز قد تخترق الجلد تلقائيًا أو تصبح مرئيّة أو تسبب تهيجًا يتطلب إزالة الغرز.
3. عدم انتظام سطح وشكل ولون الجلد موضع الجراحة، وعدم تماثل الشكل على الفخذ عقب الجراحة.
4. عدم التئام الجرح بالجلد موضع الجراحة مما قد يتطلب جراحة أخرى.
5. تجمع السوائل seroma: نادرًا ما تتراكم السوائل بين الجلد والأنسجة بعد الجراحة. في حالة حدوث هذه المشكلة، قد تتطلب إجراءات إضافية لتصريف السوائل.
6. على الرغم من توقع نتائج جيدة، لا يوجد ضمان صريح أو ضمني، على النتائج التي يمكن الحصول عليها.
7. مشاكل التئام الجروح: بعض الحالات الطبية والمكملات الغذائية والأدوية قد تؤخر وتتداخل مع الالتئام. المدخنون أكثر عرضة لخطر فقدان الجلد ومضاعفات التئام الجروح.
8. حدوث تشوه أو تغير بشكل وسطح الجلد المغطى للعانة والأجزاء التناسلية الخارجية لدى النساء مما قد يستلزم عمليات جراحية أخرى.
9. وجود تحجر بالأنسجة والدهون أسفل موضع الجراحة.
10. دائمًا ما تكون زوائد الجلد المتبقية في نهايات الجروح أو ضفائر الجلد عندما يكون هناك فائض في الجلد. قد يتحسن هذا بمرور الوقت، أو يمكن تصحيحه جراحيًا.
11. عدم التماثل: قد لا ينتج مظهر الجسم المتماثل.
12. قد تجد قطعة من الدهون طريقها إلى مجرى الدم، نادره الحدوث وتؤدي إلى حالة خطيرة أو تهدد الحياة والسكتة الدماغية، والتهاب السحايا (التهاب الدماغ)، عدوى خطيرة، العمى أو فقدان الرؤية، أو الموت.
13. نخر الدهون: الأنسجة الدهنية الموجودة في عمق الجلد قد تموت. قد ينتج عن ذلك مناطق متماسكة داخل الجلد. قد يكون من الضروري إجراء جراحة إضافية لإزالة مناطق نخر الدهون.
14. يمكن أن يحدث التورم المستمر في الساقين بعد الجراحة.

الموافقة الخطية المستنيرة على اجراء عملية جراحية لتنسيق القوام لشد الفخذين
Medial Thigh Lift

بدائل علاجيه: شد الفخذ من الداخل هو عملية جراحية اختيارية .تتكون الخيارات الأخرى من عدم معالجة مناطق الجلد المترهل والتكتلات الدهنية، استئصال الدهون بمساعدة تقنيه الشفط قد يكون بديلا للحالات ذو الوزن الطبيعي .برامج النظام الغذائي وممارسة الرياضة قد تكون مفيدة في الحد من الدهون الزائدة في الجسم وتحسين القوام .ترتبط المخاطر والمضاعفات المحتملة أيضًا بالأشكال الجراحية البديلة للعلاج.

المقر بما فيه (الاسم ثلاثى): ..... ☐ ذكر ☐ انثى **السن :** .....

الصـفـة : ☐ المريض ☐ ولى الامر ☐ قريب ☐ أخرى .....

في حالة عدم توقيع المريض السبب ☐ قاصر ☐ قصور ذهنى ☐ غائب عن الوعى ☐ أخرى .....

التوقيع : ..... **التاريخ :** ..... **الوقت :** ..... **رقم تحقيق الشخصية:** .....

الطبيب المعالج:

- أقر بأنني قد قمت بشرح طبيعة الإجراء الجراحي المقرر للمريض والبدائل العلاجية له والمضاعفات الوارد حدوثها، كما أعطيت له الفرصة لطرح كافة الأسئلة المتعلقة بذلك الإجراء وقمت بالإجابة عليها.
- كما أقر أن العملية الجراحية عالية تهدف إلى علاج المريض عن طريق شد الفخذ الإنسي.
- كما أقر أنني قد قمت باتخاذ كافة الاحتياطات والفحوصات الطبية المعمول بها قبل إجراء هذا التداخل الجراحي من تحاليل طبية وأشعات مع التزامي الكامل بمتابعة المريض بعد إجراء الجراحة وحتى تمام الشفاء.

❖ **نوع التخدير المستخدم اثنـــاء الجراحة** ☐ تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ

المقر بما فيه:

الطبيب المعالج (الاسم الثلاثي): ..... التوقيع: ..... القسم التابع له: ..... التاريخ: ..... الوقت: .....

❖ **الشاهد/ المترجم على توقيع المريض**

الاسم : ..... **التوقيع:** ..... **التاريخ:** ..... **الوقت:** ..... **الرقم القومى:** .....

ملاحظات هامـــة:

- لا يسمح بإجراء أي تعديلات علي هذا النموذج بعد الانتهاء من تعبئته وإنما يستبدل بنموذج آخر جديد.
- يحتفظ المريض أو من ينوب عنه بنسخة من هذا الإقرار.

رقم تذكرة المريض	.....

النموذج المعتمد من الجمعية المصرية لجراحى التجميل والاصلاح

Guidelines of Fat transfer

Definitions

Lip filling - is the procedure done to enhance different body parts by using the patient's own fats .

Objectives: To enhance and rejuvenate the cheeks, lips, hollows under the eyes and hands.

Is indicated for person who has localized wasting or defective area of subcutaneous fat due to weight loss or previously present asymmetry e.g. facial, gluteal, legs and dorsum of the hands.

Purpose: To define the standard steps for Lipofilling procedure in Taiba Hospital .

Policy: All Lipofilling procedures should be done according to the following steps.

Procedures:

1. Doctor should complete the required documentation that includes patient assessment, clinical examination, necessary blood investigation, management plan, patient counseling and preoperative instructions and preparations.
2. Preparation of the pre-operative requirements includes laboratory or blood investigation and consent signing. Doctor should ensure that the patient fully understood and agreed for the procedure before signing the consent.
3. According to the universal protocol and standards, the nurse gives verification and the doctor should do prophylactic antibiotic and site markings to the preferred area in the ward.
4. Medications are administered during surgery and the choice includes intravenous sedation and general anesthesia by the anesthetist in-charged or team.
5. Preparation of the required instruments in a sterile field.
6. Scrub your hands according to the standard steps. Put on the sterile gown and gloves. Aseptic technique should be strictly observed by all members of the operating team.
7. Time out to be initiated by the nurse before the procedure.
8. Five moments of hand hygiene to be implemented by the team .
9. Toweling and draping of the patient. Put patient in an appropriate position for the procedure.
10. A small skin stab is done in the area from which the fat is to be aspirated.
11. Infiltration of fluid in accordance to the local policy.
12. Aspiration of the fat with the injected fluid manually by using 2 mm diameter cannula.
13. Prepare the fat in the centrifuge machine with the rate of 3000 c/m for 1-3 minutes time or just left the fat to sediment
14. A wider pore cannula or power assisted machine can be used for fat aspiration.
15. Injection of the fat subcutaneously in multiple levels and planes in the recipient area by threading technique and 14 G cannula.
16. Closure of the skin stabs by simple sutures. Wearing pressure garments to the donor site to reduce swelling and bruises.
17. The postoperative plan includes; the patient will need either to be observed in PACU or shift to the ward.

18. Doctor will prescribe postoperative medication like antibiotics and painkillers for few days as Lipofilling can cause some discomfort.
19. The patients should be instructed about their postoperative care, conditions, expectations and other instructions such as avoiding pressure on the recipient site.
20. Medications and postoperative visits should be documented in the discharge summary and discharge of the patient is planned and arranged according to the patient's clinical condition. Most of the patient can be discharged at the same day of surgery.
21. The donor site sutures are removed 5 days post operatively.

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقة الخطية المستنيرة على اجراء عملية جراحية لحقن ونقل الدهون

Fat Transfer /Lipofilling

المريض:

أقر أنا الموقع أدناه أنني موافق على إجراء التداخل الجراحي المبين عاليه، وأقر أن الطبيب قد قام بشرح طبيعة ذلك التداخل الجراحي والهدف منه، كما أوضح البدائل المتاحة لهذا الإجراء الجراحي. كما أقر أنني على كامل المعرفة بالمضاعفات الطبية والجراحية ممكنة الحدوث من جرّاء تلك العملية.

❖ **معلومات عامه:**

1. يمكن استخدام دهون الشخص لتحسين مظهر الجسم عن طريق شفطه من منطقة (عادة في الفخذين أو البطن (الي منطقة اخرى نتيجه لفقدانها الدهون بسبب الشيخوخة، اوالحوادث، اوالجراحة، اوالعيوب الخلقية، أو أسباب أخرى.
2. يتم حقن المناطق التي يتم شفط الدهون منها بسائل يحتوي على ادرينالين ومخدر موضعي .
3. يتم شفط الدهون من الجسم باستخدام أداة جراحية)كانيولا شفط الدهون (من خلال شق صغير أو يمكن استئصالها)قطعها (مباشرة من خلال شق أكبر في بعض الحالات.
4. يتم تحضير الدهون بطريقة معينة قبل حقنها في الجسم .و يشمل هذا التحضير غسل، ترشيح، وطرد مركزي للدهن .يتم بعد ذلك وضع الدهون في المنطقة المرغوبة باستخدام كانيولا أو إبرة، أو يمكن وضعها مباشرة من خلال جرح صغير.
5. بعض الدهون لا تحافظ على حجمها بمرور الوقت.ولذا فقد يقوم الجراح بحقن أكثر مما هو مطلوب في ذلك الوقت لتحقيق النتيجة النهائية المرغوبة .ستنخفض كمية الدهون المنقولة خلال أسابيع قليلة .في بعض الأحيان، قد تحتاج إلى نقل المزيد من الدهون للحفاظ على النتائج المرجوة .
6. يمكن إجراء نقل الدهون باستخدام مخدر موضعي أو تخدير عام .
7. اعلم تمام العلم ان الدهون المحقونة يحدث لها امتصاص وتقل بنسبة من 30-60% او أكثر في الستة أشهر الاولى. كما أبلغني الطبيب أن حقن الدهون يحتاج الى أكثر من مرحلة للوصول للنتيجة المرجوة.

بدائل علاجيه: عدم التدخل الجراحي. النظام الغذائي وممارسة الرياضة، تتكون الأشكال البديلة غير الجراحية والجراحية من حقن مواد من صنع الإنسان لتحسين حجم الأنسجة مثل حمض الهيالورونيك، حمض اللبنيك، وما إلى ذلك، واستخدام الحشوات ، أو غيرها من العمليات الجراحية التي تنقل السدلات من الجسم.

❖ **مضاعفات خاصة بذلك الإجراء الجراحي:**

1. تغير الإحساس بالجلد موضع الجراحة.
2. تجمع سوائل (مصل الدم): نادرًا ما تتراكم السوائل بين الجلد والأنسجة الكامنة بعد الجراحة. في حالة حدوث هذه المشكلة، قد تتطلب إجراءات إضافية لتصريف السوائل.
3. عدم انتظام سطح وشكل ولون الجلد موضع الجراحة.
4. عدم التئام الجرح بالجلد موضع الجراحة مما قد يتطلب جراحة أخرى.
5. وجود تحجر بالأنسجة والدهون أسفل موضع الجراحة.
6. عند حدوث زيادة في الوزن قد يحدث عدم استواء في الجزء الذي تم الشفط منه وقد تحتاج لتدخل.
7. من الجائز الشعور بعدم الرضا من الشكل النهائي عقب الجراحة.
8. على الرغم من توقع نتائج جيدة، لا يوجد ضمان صريح أو ضمني، على النتائج التي يمكن الحصول عليها.
9. قد تجد قطعة من الدهون طريقها إلى مجرى الدم، نادره الحدوث وتؤدي إلى حالة خطيرة أو تهدد الحياة والسكتة الدماغية، والتهاب السحايا)التهاب الدماغ(، عدوى خطيرة، العمى أو فقدان الرؤية، أو الموت.
10. نخر الدهون :الأنسجة الدهنية الموجودة في عمق الجلد قد تموت .قد ينتج عن ذلك مناطق متماسكة داخل الجلد .قد يكون من الضروري إجراء جراحة إضافية لإزالة مناطق نخر الدهون.
11. (التورم المستمر)الوذمة اللمفية: يمكن أن يحدث التورم المستمر في الساقين بعد الجراحة.

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقة الخطية المستنيرة على اجراء عملية جراحية لحقن ونقل الدهون
Fat Transfer /Lipofilling

المقر بما فيه (الاسم ثلاثى): ..... ☐ ذكر ☐ انثى السن : .....

الصفة : ☐ المريض ☐ ولى الامر ☐ قريب ☐ أخرى .....

في حالة عدم توقيع المريض السبب ☐ قاصر ☐ قصور ذهنى ☐ غائب عن الوعى ☐ أخرى .....

التوقيع : ..... التاريخ : ..... الوقت : ..... رقم تحقيق الشخصية: .....

❖ نوع التخدير المستخدم اثنـــاء الجراحة ☐ تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ

الطبيب المعالج:

❖ أقر بأنني قد قمت بشرح طبيعة الإجراء الجراحي المقرر للمريض والبدائل العلاجية له والمضاعفات الوارد حدوثها، كما أعطيت له الفرصة لطرح كافة الأسئلة المتعلقة بذلك الإجراء وقمت بالإجابة عليها.

❖ كما أقر أن العملية الجراحية عالية تهدف إلى علاج المريض عن طريق اجراء عملية جراحية تجميلية لحقن ونقل الدهون.

❖ كما أقر أنني قد قمت باتخاذ كافة الاحتياطات والفحوصات الطبية المعمول بها قبل إجراء هذا التداخل الجراحي من تحاليل طبية وأشعات مع إلزامي الكامل بمتابعة المريض بعد إجراء الجراحة وحتى تمام الشفاء.

المقر بما فيه:

الطبيب المعالج (الاسم الثلاثي): ..... التوقيع: ..... القسم التابع له: ..... التاريخ: ..... الوقت: .....

❖ الشاهد/ المترجم على توقيع المريض

الاسم : ..... التوقيع: ..... التاريخ: ..... الوقت: ..... الرقم القومى: .....

ملاحظات هامـــة:

- لا يسمح بإجراء أي تعديلات علي هذا النموذج بعد الانتهاء من تعبئته وإنما يستبدل بنموذج آخر جديد.
- يحتفظ المريض أو من ينوب عنه بنسخة من هذا الإقراروبعتبر سارى لمدة اسبوع من تاريخ توقيع المريض

رقم تذكرة المريض	.....

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقة الخطية المستنيرة على اجراء عملية جراحية لتنسيق القوام للأرداف بالحقن او جراحه الشد او الرفع

Buttock lift–Augmentation–Fat transfer

المريض:

أقر أنا الموقع أدناه أنني موافق على إجراء التداخل الجراحي المبين عاليه، وأقر أن الطبيب قد قام بشرح طبيعة ذلك التداخل الجراحي والهدف منه، كما أوضح البدائل المتاحة لهذا الإجراء الجراحي. كما أقر أنني على كامل المعرفة بالمضاعفات الطبية والجراحية ممكنة الحدوث من جرّاء تلك العملية.

❖ معلومات عامه:

شد الأرداف هو إجراء جراحي لازاله الجلد الزائد والأنسجة الدهنية من الوركين والفخذين والظهر والأرداف، وقد يشمل أيضًا وضع الدهون في مناطق معينة من الأرداف لتعزيز المنطقة .قد يشمل الإجراء الخاص بك أيضًا شفط الدهون و /أو نقل الدهون)إعادة حقن الدهون أو نحت الدهون (من هذه المناطق أو غيرها لتشكيل أو تعزيز الحجم .رفع الأرداف ليس علاجًا جراحيًا لزيادة الوزن .يجب على الأشخاص الذين يعانون من السمنة المفرطة لفقدان الوزن تأجيل جميع أشكال جراحة تنسيق القوام حتى يصلوا إلى وزن مستقر .هناك مجموعة متنوعة من التقنيات المختلفة التي يستخدمها جراحي التجميل لرفع الأرداف .يمكن دمج شد الأرداف مع أشكال أخرى من جراحة تنسيق القوام، بما في ذلك جراحة شفط الدهون ، أو إجراؤها في نفس الوقت مع جراحات اختيارية أخرى .قد تتطلب الجراحة نقل منتجات الدم؛ ومع ذلك، يختلف هذا على أساس كل حالة على حدة.

يمكن إزالة الدهون من الجسم عن طريق أداة جراحية)كانيولا (من خلال شق صغير أو قد يتم استئصالها)قطعها (مباشرة من خلال شق أكبر .في بعض الحالات، يتم تحضير الدهون بطريقة معينة قبل حقنها مرة أخرى في الجسم .و يشتمل هذا على غسيل، ترشيح، وطرد مركزي للدهون .يتم بعد ذلك وضع الدهون في المنطقة المرغوبة إما باستخدام كانيولا أو إبرة صغيرة، أو يمكن وضعها مباشرة من خلال شق .نظرًا لأن بعض الدهون المنقولة لا تحافظ على حجمها بمرور الوقت، فقد يقوم الجراح بحقن أكثر مما هو مطلوب في ذلك الوقت لتحقيق النتيجة النهائية المرغوبة .ستنخفض كمية الدهون المنقولة خلال أسابيع قليلة .في بعض الأحيان، قد تحتاج إلى نقل المزيد من الدهون للحفاظ على النتائج المرجوة .يمكن إجراء عمليات نقل الدهون باستخدام مخدر موضعي أو تخدير عام اعتمادًا على مدى الإجراء.

وفي حاله الجراحة، هناك أكثر من شكل للجرح الخاص بالعملية قد يكون أسفل الضهر وفوق الارداف وقد يمتد ليشمل الاجناب وأسفل البطن علي حسب احتياجاتك أو في بعض حالات ما بعد عمليات السمنة المفرطة وينتج عنه اثار ندبات لا تختفي نهائيا ويتحسن اثارها مع مرور الوقت والعلاجات الموضعية.

اتفهم تماما احتمال حدوث تورم او ازرقاق في فترة ما بعد الجراحة والتي قد تمتد لأكثر من أسبوعين.

استخدام الدرنقه الجراحية :drainsأثناء الجراحة، قد يجد طبيبك أنه من الضروري وضع مُصرف .التصريف عبارة عن أنبوب صغير يقوم بتصريف السوائل من المنطقة التي تم إجراء العملية عليها .سيتم إرشادك حول استخدام المصرف الخاص بك .قد يتطلب وضعه شقًا صغيرًا منفصلاً .ستتم إزالته عندما يشعر طبيبك أنه لم يعد ضروريًا .

علي علم بالخطوات من الفتح الجراحي والخيوط الجراحية وخطوات الجراحة. كما أنني اتعهد بالالتزام بتوصيات الطبيب من ضرورة لبس المشد لمدة لا تقل عن شهرين بعد الجراحة. وفى حالة إخلالي بمتابعة اوامر الطبيب فأن الطبيب والفريق الطبي المساعد له غير مسئولين عن نتيجة الجراحة.

الموافقة الخطية المستنيرة على اجراء عملية جراحية لتنسيق القوام للأرداف بالحقن
او جراحه الشد او الرفع Buttock lift-Augmentation-Fat transfer

بدائل علاجيه: هي عملية جراحية اختيارية .تتكون الخيارات الأخرى من عدم معالجة مناطق الجلد المترهل بالجراحة .قد تكون جراحة شفط الدهون بديلاً جراحيًا إذا كان هناك ليونة جلد جيد وتكتل دهني موضعي لفرد من الوزن الطبيعي .حقن مواد من صنع الإنسان لتحسين حجم الأنسجة) مثل حمض الهيالورونيك، حمض عديد اللبنيك، إلخ(، واستخدام الغرسات الاصطناعية، أو الإجراءات الجراحية الأخرى التي تنقل الدهون من الجسم مثل السدلات .ترتبط المخاطر والمضاعفات المحتملة بأشكال العلاج البديلة .ترتبط المخاطر والمضاعفات المحتملة أيضًا بالأشكال الجراحية البديلة للعلاج.

❖مضاعفات خاصة بذلك الإجراء الجراحي:

1. تسطيح الأرداف :قد تؤدي جراحات رفع الأرداف إلى تسطيح منطقة الأرداف .يؤدي شد جلد أسفل الظهر إلى الأعلى الى هذه النتيجة .قد يقوم الجراح ببعض الإجراءات لتقليل هذا التأثير .يمكن تنفيذ هذه الإجراءات أثناء الجراحة الأصلية أو بشكل ثانوي، اعتمادًا على تفضيل المريض والجراح.
2. فقدان الأنسجة -في حالات نادرة، قد تتسبب الدهون المنقولة في إصابة الجلد على المنطقة المعالجة مما يؤدي إلى فقدان الجلد والأنسجة المحيطة .قد يؤدي ذلك إلى ترك الندوب والتشوهات ويتطلب جراحة للعلاج.
3. تجمع السوائل: نادرًا ما تتراكم السوائل بين الجلد والأنسجة الكامنة بعد الجراحة. في حالة حدوث هذه المشكلة، قد تتطلب إجراءات إضافية لتصريف السوائل.
4. وجود تحجر بالأنسجة والدهون أسفل موضع الجراحة.
5. فقد الإحساس بالجلد موضع الجراحة.
6. الندبات: جميع العمليات تترك ندبات، بعضها أكثر وضوحا من البعض الآخر. على الرغم من التئام الجروح بشكل جيد بعد الجراحة، قد تحدث ندوب غير طبيعية داخل الجلد والأنسجة العميقة. قد تكون الندوب غير جذابة ولونها مختلف عن لون البشرة المحيطة. قد يختلف مظهر الندبة في نفس الندبة. قد تكون الندوب غير متماثلة (تظهر مختلفة على الجانب الأيمن والأيسر من الجسم). هناك إمكانية وجود علامات واضحة في الجلد من الغرز. في بعض الحالات، قد تتطلب الندوب مراجعة جراحية أو علاجيه.
7. قد يحدث إعادة ترهل الجلد بمرور الوقت .يحدث هذا بسبب استجابة الجسم المتأصلة للتمدد .المرضى الذين فقدوا كميات كبيرة من الوزن عرضة لهذه الظاهرة .
8. الغرز قد تخترق الجلد تلقائيًا أو تصبح مرئيه أو تسبب تهيجًا يتطلب إزالة الغرز.
9. عدم انتظام سطح وشكل ولون الجلد موضع الجراحة، وعدم تماثل الشكل بين الجانب الأيمن والايسر.
10. عدم التئام الجرح بالجلد موضع الجراحة مما قد يتطلب جراحة أخرى.
11. على الرغم من توقع نتائج جيدة، لا يوجد ضمان صريح أو ضمني، على النتائج التي يمكن الحصول عليها.
12. من الجائز الشعور بعدم الرضا من الشكل النهائي عقب الجراحة.
13. مشاكل التئام الجروح: بعض الحالات الطبية والمكملات الغذائية والأدوية قد تؤخر وتتداخل مع الالتئام. المدخنون أكثر عرضة لخطر فقدان الجلد ومضاعفات التئام الجروح.
14. قد تجد قطعة من الدهون طريقها إلى مجرى الدم، نادره الحدوث وتؤدي إلى حالة خطيرة أو تهدد الحياة والسكتة الدماغية، والتهاب السحايا (التهاب الدماغ)، عدوى خطيرة، العمى أو فقدان الرؤية، أو الموت.
15. نخر الدهون: الأنسجة الدهنية الموجودة في عمق الجلد قد تموت. قد ينتج عن ذلك مناطق متماسكة داخل الجلد. قد يكون من الضروري إجراء جراحة إضافية لإزالة مناطق نخر الدهون.
16. قد تحدث اصابه للأجزاء العميقة مثل الأعصاب أو الأوعية الدموية أو العضلات خلال هذا الإجراء .تختلف إمكانية حدوث ذلك وفقًا للمكان الذي يتم فيه تنفيذ الإجراء على الجسم .قد تكون الإصابة مؤقتة أو دائمة.

الموافقة الخطية المستنيرة على اجراء عملية جراحية لتنسيق القوام للأرداف بالحقن او جراحه الشد او الرفع

Buttock lift–Augmentation–Fat transfer

النموذج المعتمد من الجمعية المصرية لجراحى التجميل والاصلاح

المقر بما فيه (الاسم ثلاثى): ..... ☐ذكر ☐ انثى السن : .....

الصفة : ☐المريض ☐ ولى الامر ☐ قريب ☐ أخرى .....

في حالة عدم توقيع المريض السبب ☐ قاصر ☐ قصور ذهنى ☐ غائب عن الوعى ☐ أخرى .....

التوقيع : ..... التاريخ : ..... الوقت : ..... رقم تحقيق الشخصية: .....

❖ نوع التخدير المستخدم اثنـــاء الجراحة ☐ تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ

الطبيب المعالج:

- ❖ اقر بأنني قد قمت بشرح طبيعة الإجراء الجراحي المقرر للمريض والبدائل العلاجية له والمضاعفات الوارد حدوثها، كما أعطيت له الفرصة لطرح كافة الأسئلة المتعلقة بذلك الإجراء وقمت بالإجابة عليها.
- ❖ كما أقر أن العملية الجراحية عالية تهدف إلى علاج المريض عن طريق شد الارداف او نقل الدهون او شفطها.
- ❖ كما أقر أنني قد قمت باتخاذ كافة الاحتياطات والفحوصات الطبية المعمول بها قبل إجراء هذا التداخل الجراحي من تحاليل طبية وأشعات مع التزامي الكامل بمتابعة المريض بعد إجراء الجراحة وحتى تمام الشفاء.

المقر بما فيه:

الطبيب المعالج (الاسم الثلاثي): ..... التوقيع: ..... القسم التابع له: ..... التاريخ: ..... الوقت: .....

❖ الشاهد/ المترجم على توقيع المريض

الاسم : ..... التوقيع: ..... التاريخ: ..... الوقت: ..... الرقم القومى: .....

ملاحظات هامـــة:

- لا يسمح بإجراء أي تعديلات علي هذا النموذج بعد الانتهاء من تعبئته وإنما يستبدل بنموذج آخر جديد.
- يحتفظ المريض أو من ينوب عنه بنسخة من هذا الإقرار.

رقم تذكرة المريض .....

Guidelines of Stem Cells

Stem Cells: are defined by their capacity of self-renewal and multilineage differentiation.

Mesenchymal stem cells (MSCs) described as a bone-marrow-derived mononuclear cell population that when cultured ex vivo, adhered to plastic with a fibroblast-like morphology .

Mesenchymal stem cells characterized as plastic adherent, fibroblastoid cells Which reside within the connective tissues of most organs.

These cells can differentiate into osteogenic, adipogenic and chondrogenic lineages.

Possess the capacity to trans-differentiate into epithelial cells and lineages derived from the neuro-ectoderm.

Cells can migrate to the sites of injury, inflammation, and to tumors.

These properties of mesenchymal stem cells used in regenerative medicine and efficient in site-specific therapy

Adipose-derived stem cells (ASCs) can be isolated from human adipose tissue with differentiation into mature adipocytes.

(ASCs) Used in Clinical applications as:

- Acute myocardial infarction.
- Peripheral vascular disease.
- Soft and bony tissue defects.
- Crohn's-related fistula
- In esthetic and reconstructive surgery
- Breast surgery.
- Wound healing
- Peripheral nerve injury
- Soft tissue defects
- Facial asymmetry

The Potential Degree Of Cellular Differentiation Ranges From

1) **Totipotent stem cells :** Produce adult cell types derived from all three embryonic germ layers (ectoderm, endoderm, and mesoderm) and placenta.
2) Pluripotent stem cells: Arise from all three germ layers (e.g. Endoderm-derived hepatocytcs, ectoderm-derived neurons, and mesoderm-derived bone marrow).
3) Multipotent stem cells : Give rise to lineage-restricted, Tissue-specific cell types.
   * Hepatic Stem Cells → Hepatocytes.
4) Unipotent stem cells - Only generate once-cell type.

Classification & sources of stem cells

Stem cells can be classified into four broad types based on their origin:

a. Embryonic (stem and germ cells).
b. Fetal stem cells.
c. Umbilical cord stem cells.
d. Adult Stem Cells.

The regulation of self-renewal and differentiation :

Controlled by:

- Extracellular mechanisms (regulatory molecules and microenvironment).
- Intracellular mechanisms (proto-oncogenes, cell cycle regulators, tumor suppressor genes & transcription factors.

Policy & Procedure

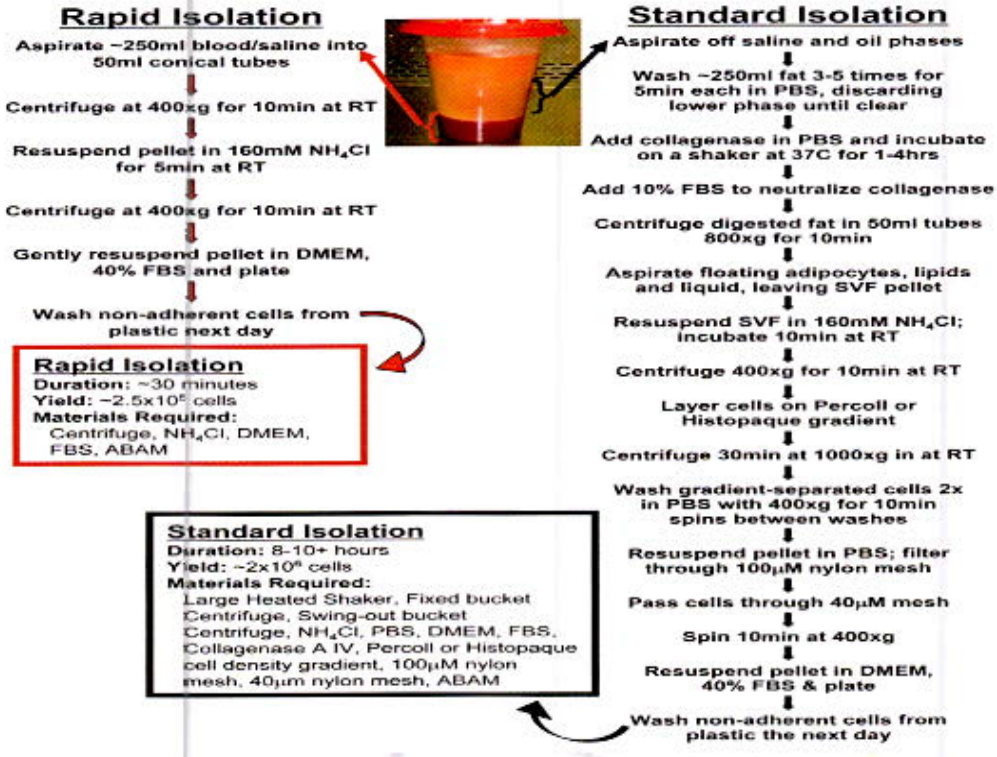
Why we prefer adipose tissue derived stem cells:

- Can be found in abundant quantities (millions of cells).
- Can be harvested with a minimally invasive procedure .
- Can be differentiated along multiple cell lineage pathways in a regular and reproducible manner.
- Can be safely and effectively transplanted to either an autologous or allogeneic host.

Patients' selection:

- Full clinical examination, proper needed investigations according to patient condition.
- Anaesthesia either local analgesia or general anaesthesia.
- Under complete aseptic technique the fat is harvested using the tumescent fluid & canula 3:4 mm. using traditional or power assisted machine.

Isolation of stem cells :



The isolated stem cells are used either as a pellet carried on saline or PRP,or with lipoaspirate or nannofat.

Guidelines of Platelet Fibrin Glue

Introduction

Healing is a complex process pass through three stages, introduction

1. Inflammation
2. Proliferation
3. Remodeling

All these stages are controlled by growth factors. Platelets are a rich storage of these growth factors. Measuring of these factors in a chronic wound showed a low level compared to acute wound. So, this is considered a cause of wound failure:

Fibrinogen + thrombin = Fibrin Glue
Fibrinogen + thrombin + platelet = platelet Fibrin Glue

This biomaterial has a tensile strength that helps in gradual sustained release of platelet growth factors that orchestrate healing

Function

1. **Platelet is a source of many growth factors,**
2. **Thrombin is an activator to platelet to release growth factors.**
3. **Fibrinogen + thrombin give fibrin glue clot that results in:**
    a. Sustained release of growth factors to the wound
    b. Control bleeding from the wound.
    c. Seal any minute defects in the repair.
    d. Help adhesion between the layers of repair.

Preparation

Equal amounts of Fibrinogen + thrombin + platelet

1- Platelet

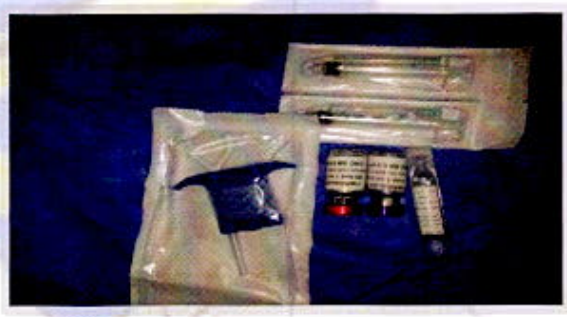
Normal value is 150000 - 450000 /ml
After adding anticoagulant to 10 ml of blood that divided in two tubes
centrifuge 3000 RPM for 10 min, this will gives 1 ml platelet rich plasma (PRP) at the junction between red blood cells down and plasma up with platelet value up to ten folds.

2- Fibrinogen

Direct from a bag of cryoprecipitate = 7.5 g / 100ml
Normal blood value = 200- 400 m.g./100

3- Thrombin

From plasma unite 100 ml +5 ampoules Ca gloconate +centrifuge 3500 RPM for 20 min
A clot will precipitate leaving fluid rich in thrombin can be aspirated in syringes



Lyophilized already prepared fibrin glue is already avaluable

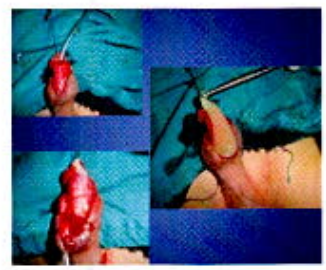
Clinical application in plastic surgery

1- Urethral Repair

The prepared clot is applied to cover the repair in constructed urethra the covered by fascia and skin.
The same can be done in treating urethral fistula.

In hypospadius it minimize fistula by:

A- Help healing (Plateles).
B- Control bleeding.
C- Seal any minute defects in the repair.
D- Help adhesion between the layers of repair.

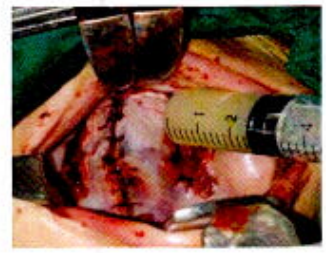


2- Cleft palate repair

After completing the repair the clot is applied
between nasal and oral layers using a syringe
then light pressure by a finger for two minuts

in Cleft Palate----- minimize fistula

A. Help healing (platelets)
B. Control bleeding , minimize hematoma collection
C. Seal any minute defects in the repair'
D. Help adhesion between the layers of repair prevent sagging of flaps
E. Isolate the row areas, so minimize pain, help early feeding.



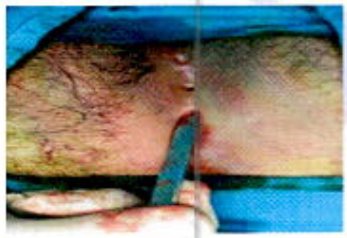
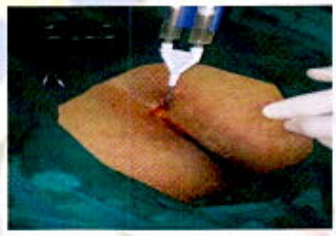
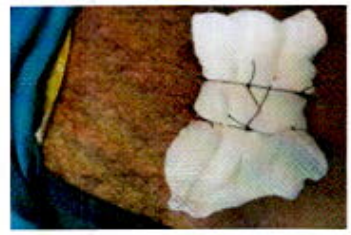
3- Graft Fixation & Donner area

1. Control hemorrhage from the bed so avoid graft rejection.
2. Fixing graft to the bed only pressure for three minutes.
3. No need for sutures.
4. Help graft vasculrization even in less vascular ulcer or in mild infected would.
5. Accelerate healing of the donner.

4- Pilonedal sinus

After curette the sinus and repeated wash, the clot is injected into the sinus cavity using a syringe then tie dressing is applied for three days

A. Help healing (Platelets).
B. Avoid hematoma or serum accumulation.
C. Seal the defects.
D. Help adhesion between tissues.

5. Gynicomastia

After removal of the tissue and suturing the wound the components are applied in dead space and bandage is applied when the arms

- Help healing of the wound

a. Hemostasis prevent hematoma.
b. No need for drain.
c. Obliterate the dead space prevent seroma.
d. Adhesion between skin and fascia prevent skin redundancy.

6- Acute wound, Chronic wound and burn

Platelet fibrin glue can be applied to the wound surface or injected in the edge of chronic ulcer:

a. It enhance healing due to growth factor.
b. Infection control.
c. Minimize pain (wound cover).
d. Help bed preparation for graft or flap.

Aesthetic & Reconstructive Plastic Surgery Guidelines

Liposuction Definition:

- Liposuction is a surgical procedure used to extract fat and fat cells from the subcutaneous planes of the body of the human being using connulas and probes connected to vaccum machines (-ve suction)
- Energy assisted lyposuction has emerged since the late 80'n and advancement in its technology has happened till the day using ultrasound – laser -radio – frequency – and mechanical vibrating power equipment.
- Liposuction can be the main target of the procedure or can be part of many other plastic surgery procedure.
- Liposuction is a procedure that needs training and should not be done by non- plastic surgeons.
- The use of energy devices during liposuction needs special training and should not be done by (non plastic surgeons) and plastic surgeons should be trained on there use.

Guidelines

(1) Choice of the patient

- Preferred to exclude extremes of age – childhood and elderly
- All medical check-up lab and radiology should be asked for and included in pre operative assessment. (lab-x.ray-diagnostic ultrasound)
- Diabet us – long term smoking – anticoagulation therapy – kidney and liver disease – chest disease are considered risk factors and should be well assessed and controlled.
- Morbid obesity is a high risk factor and should not be treated by liposuction.
- Clinical examination with accuracy and assessment of previous surgical scares and possibility of hernias should by well assessed.

(2) During the 1st visit and consultation

- The procedure should be well described to the patient (pre-intra and post operative sequences)
- Photography session pre operatively is highly recommended.
- Clinical evaluation and examination including previous surgeries and presence of hernias.

(3) Evaluation with a check - list in pre-operative visits in recommended to document and eliminate possibility of missing any important point.

(4) The procedure can be done by local Regional – General anaesthesia (Presense of a consultant anaesthetist is a must)

(5) Amount of local anaesthesia & other drugs used should be documented and the upper limits should be respected.

(6) Wet and tumescence technique are recommended.

(7) Upper limit of total volume of liposuction extract from a single patient in one operation should not exceed 7%-8% of patients body weight i.e. max of 5-7 liter total volume extracted including all elements of extract

(8) **Patient should be kept under medical observation** in a medical facility for at least

a) Up to 1.5 liter extract few hrs post operative observation.
b) 1.5 to 3 liter 12 hrs observed post operative.
c) 3-6 liter minimum 24 hrs stay post operative in medical facility.

(9) Post – operative use of pressure garments and massage and physiotherapy will be of value in most cases.
(10) Post operative drainage is left to surgeons judgment.
(11) Support and follow-up visits post – operatively are a must and part of the procedure.

Introduction

The ESPRS board has been overwhlmed by the number of complications and deaths which result from malpractice in the persumably most safe plastic surgery procedure which is liposuction.

It has been found that this was largely due to:

1- Intrusion of non plastic surgeons with no training or experience.
2- Massive liposuction in improper situations.
3- Abdominal perforations were the cause of death in maney patients with or without previous abdominal operations or laparoscopic bariatric surgery.
4- Performing this procedure in poorly equipped facilities with lack of proper postoperative care and transfusion facility.
5- Pulmonary embolism wheather thrombotic or fat embolism.
6- Complications related to wound healing and skin sloughing especially with more recent techniques like laser and vaser in unexperienced hands.

This is a review article on liposuction with emphasis on the safety guigelines to be followed by the ESPRS members.

When liposuction was first introduced and popularized in the early 1980s, it incredibly altered the field of body contouring surgery and redefined plastic surgery for future generations of surgeons. Since then liposuction continues to rank among the most frequently performed plastic surgical and indeed one of the most common of all elective surgical operations. (A.Matarasso and S.Levine, 2013).

Liposuction is a highly effective surgical intervention designed to treat superficial and deep deposits of subcutaneous fat distributed in aesthetically unpleasing proportions, thereby improving body contour. Although liposuction was originally intended to treat minor contour irregularities, advances in liposuction surgical techniques and a better understanding of the physiologic consequences of liposuction have enabled recontouring of large regions and multiple body areas. These advances have changed the nature of liposuction, taking it from the realm of a minor surgical procedure to that of major surgery. In an effort to ensure the safety of patients undergoing liposuction in the hospital and ambulatory surgery setting, the American Society of Plastic Surgeons (ASPS) Patient Safety Committee sought to develop a liposuction practice advisory to assist physician decision-making. This advisory serves to update and expand on a prior practice advisory on liposuction issued by the ASPS. The recommendations were graded (A through D) with the ASPS Grades of Recommendation Scale; grades correspond to the levels of evidence provided by the supporting literature for that recommendation. (Phillip C. Haeck, et. al, 2009).

Grade	Descriptor	Qualifying Evidence	Implications for Practice
A	Strong recommendation	Level I evidence or consistent findings from multiple studies of levels II, III, or IV	Clinicians should follow a strong recommendation unless a clear and compelling rationale for an alternative approach is present.
B	Recommendation	Levels II, III, or IV evidence and findings are generally consistent	Generally, clinicians should follow a recommendation but should remain alert to new information and sensitive to patient preferences.
C	Option	Levels II, III, or IV evidence, but findings are inconsistent	Clinicians should be flexible in their decision-making regarding appropriate practice, although they may set bounds on alternatives; patient preference should have a substantial influencing role.
D	Option	Level V: Little or no systematic empirical evidence	Clinicians should consider all options in their decision-making and be alert to new published evidence that clarifies the balance of benefit versus harm; patient preference should have a substantial influencing role.

Table (1): Scale for Grading Recommendations, (Phillip C. Haeck, et. al, 2009)

Recommendations are the result of gathering as much as possible papers published and data from the literature and scaling them according to the Evidence Rating Scale.

Level of Evidence	Qualifying Studies
I.	High-quality, multicenter or single-center, randomized controlled trial with adequate power; or systematic review of these studies
II.	Lesser quality, randomized controlled trial; prospective cohort study; or systematic review of these studies
III.	Retrospective comparative study; case-control study; or systematic review of these studies
IV.	Case series
V.	Expert opinion; case report or clinical example; or evidence based on physiology, bench research, or "first principles"

Table (2) Evidence Rating Scale for Studies Reviewed (J.Wells & K.Hurvitz,2011)

The first recommendation for liposuction surgeries was done by the ASPS in 2009 and published in the Plastic and Reconstructive Journal. These were then revised and added upon several times and published in 2011, 2013, 2017 and finally in 2020.

In 2011, Wells and Hurvitz, prepared an article to accompany practice-based assessment of preoperative assessment, anesthesia, surgical treatment plan, perioperative management, and outcomes. In this format, the clinician is invited to compare his or her methods of patient assessment and treatment, outcomes, and complications, with authoritative, information-based references. They made an evidence based approach to a case, who presented for liposuction.(J.Wells and K.Hurvitz,2011)

The aim of these recommendations was to be a guideline for clinicians to:

1. Perform preoperative assessment and patient selection for liposuction surgeries.
2. Explain the differences among the various types of anesthesia and wetting solutions used in liposuction.
3. Identify the available literature about skin-tightening procedures.
4. Convey to patients the complication profile for various modalities of liposuction.
5. Recall important ASPS consensus guidelines when discussing liposuction.

The purpose of the 2013 evidence-based Maintenance of Certification article on liposuction is twofold: first, to briefly summarize the 2011 Maintenance of Certification article by Wells and Hurvitz on the same topic; and second, to highlight recent evidence-based publications that might not have been included in that article or were subsequently published, and discussing new levels of evidence in liposuction. **(A.Matarasso & S.Levine. 2013)**

Optimizing patient safety and outcome remains at the forefront of cosmetic surgery today. The statistics from the American Society of Plastic Surgeons reported that 1.8 million cosmetic surgical procedures were performed by board-certified plastic surgeons in the United States in 2018.Liposuction was among the five most commonly performed procedures.

Throughout its evolution, liposuction has transitioned from an isolated procedure to an adjunct with other cosmetic procedures. The original techniques in fat aspiration have evolved to provide more body sculpting and definition. Complications with liposuction have also decreased with the adherence to safety measures and following the recommendations, particularly with anesthesia, wetting solution, fluid resuscitation, liposuction technique, and postoperative monitoring for large-volume liposuction. Combined procedures in which liposuction was used as an adjunct demonstrated higher complication rates of 3.5 percent, compared to 0.7 percent when performed as an isolated procedure. Mortality from liposuction has decreased dramatically since qualified individuals were properly trained.

With the increase in cosmetic operations performed annually, periodic evaluation of safety is valuable for providing consistent outcomes. Identifying risk factors and defining procedure-specific complication rates and adopting the guidelines has helped guide patient selection and patient

education.. Safety of all cosmetic surgery is a necessity for its successful, continued practice. Although new procedures and techniques may be challenged with increased morbidity and mortality, proper training in qualified individuals can often mitigate these complications. (R.J.Rohrich,et.al,2020)

With increased focus on one's aesthetic appearance, the demands of the patients for a perfect sculptured body have also increased making them challenging for the surgeons to meet without compromising the patients' safety and without increasing the risks and the complications. Since the emergence of liposuction it has become more refined with experience, safety, patient selection, preoperative assessment, fluid management, proper technique, and overall care of the patient have been emphasized and improved. Recommendations were done to guide the surgeons and create the balance between the demands and the needs by keeping the result in the safe zone.
(C.T.Chia, et.al, 2017)

In order for the surgeon to be able to closely follow the recommendations and the guidelines, he has to know everything about liposuction in details and be updated by the newest techniques. The first recommendations were published in 2009. Before that there were two proposals in 2003 and 2007. The recommendat.on were updated and added upon according to the newest technologies and evidence based medicine in 2011, 2013 and 2017. Finally a paper about cosmetic surgery safety was published in 2020.

Liposuction Techniques:

No one single liposuction technique is best suited for all patients in all circumstances. Factors such as the patient's overall health, the patient's BMI, the estimated volume of aspirate to be removed, the number of sites to be addressed, and any other concomitant procedures to be performed should be considered by the surgeon to determine the best technique for the individual patient.
According to the amount of wetting solution used in suction-assisted liposuction it is divided into three types:

1. **Dry technique:** It is the first liposuction method developed and involves insertion of the liposuction cannula without the infiltration of subcutaneous solutions in patients under general anesthesia. Common consequences of the technique include substantial swelling and discoloration, seromas, and irregularities, along with suction aspirate containing 20 to 45 percent blood. These sequelae dramatically limit the amount of fat that can be removed without transfusion or hospitalization, thereby resulting in abandonment of this approach, except in limited applications. Some other authors define the dry technique as being the procedure of liposuction in which only 2500cc of infiltrate are injected regardless of the amount that will be suctioned.
2. **Superwet technique:** It was introduced in the mid 1980s, uses larger volumes of subcutaneous infiltrate, whereby 1 to 2 cc of solution is infused for each 1 cc of fat to be removed. The infiltrate solution consists of saline or Ringer's lactate solution with epinephrine and, in some cases, lidocaine. Using this method, blood loss generally decreases to less than 1 to 2 percent of the aspirate volume.
3. **Tumescent technique:** Introduced in 1985, it uses the largest volume of infiltrate: 3 to 4 cc of infiltrate solution is used for each planned milliliter of aspirate. Drug concentrations in the tumescent infiltrate solution vary but typically consist of 0.025% to 0.1% lidocaine and 1:1,000,000 epinephrine in a Ringer's lactate or normal saline solution. Estimated blood loss with the tumescent technique is approximately 1 percent of the aspirate, which is comparable to the superwet technique. (Phillip C. Haeck, et. al, 2009)

The wetting solution (the infiltrate):

Toledo's formula is 500cc of Saline or lactated Ringer Solution with 20cc of 2% lidocaine, 1 cc of 1:1000 epinephrine and 10 cc of 3% sodium bicarbonate.

Lidocaine is the most common anesthetic agent selected for use in wetting solutions. Historically, the recommended dose of lidocaine is lessthan7mg/kg. However, this dose does not take into consideration the slow absorption from fat, the persistent vasoconstriction from epinephrine, and removal of the agent in the liposuction aspirate, all of which contribute to a reduced risk of systemic toxicity from the lidocaine. It is generally accepted that an infiltrate solution containing up to 35 mg/kg of lidocaine is safe .Some authors suggest that lidocaine can be eliminated from the wetting solution when the operation is performed under general anesthesia.

Safety measures for the use of lidocaine are: (A.Matarasso and S.Levine,2013)

-Limit the lidocaine dose to 35 mg/kg. This level may not be safe in patients with low protein levels and other medical conditions where the metabolic byproducts of lidocaine breakdown may reach problematic levels.

- Calculate the dose for total body weight.
- Reduce the concentration of lidocaine when necessary (e.g., depending on the site of infiltration).
- Use the superwet rather than the tumescent technique.
- Consider avoiding the use of lidocaine when general or regional anesthesia is used.

Epinephrine is a critical additive in the infiltrate solution. Advantages of its use include vasoconstriction resulting in hemostasis and delayed absorption of the anesthetic agent, which prolongs its effect, decreases the amount of anesthetic needed, and reduces the risk of lidocaine toxicity. The epinephrine dosage used in infiltrate solutions varies and may range from 1:100,000 to 1:1,000,000, depending on such variables as the liposuction technique, the volume of infiltrate infused, and the type of alkalinized fluid used in the infiltrate mixture. It is recommended that epinephrine doses not exceed 0.07 mg/kg, although doses as high as 10 mg have been used safely. Epinephrine use should be avoided in patients who present with pheochromocytoma, hyperthyroidism, severe hypertension, cardiac disease, or peripheral vascular disease.

Staging the infiltration of multiple anatomical sites reduces the possibility of an excess epinephrine effect.(Phillip C. Haeck, et. al, 2009)

Assisted Liposuction techniques:

1) **Ultrasound-assisted:** It uses a cannula or probe to deliver fat-liquefying ultrasonic waves subcutaneously, enabling fat to be removed with less physical effort by the surgeon. This technique permits the removal of fat from fibrous areas such as the upper abdomen, back, and flanks with greater ease, especially during secondary procedures. Studies have shown that internal ultrasound-assisted liposuction results in slightly higher, although insignificant, blood loss than suction-assisted liposuction performed using the superwet technique.

   To prevent thermal injury the ultrasound probe or cannula must be kept in motion, and an infiltrate solution must be used to facilitate fat emulsification. The dry technique should never be used in conjunction with ultrasound-assisted liposuction.

   VASER: stands for "Vibration Amplification of Sound Energy at Resonance".

   It is the third generation technique that uses ultrasound waves to break up and liquefy fat cells, making them easier to extract resulting in their safety and smoothness due to less damage to nearby tissues, less bruising and faster recovery compared to traditional liposuction. This is done in three main steps: infiltration of tumescent fluid, emulsification of

adipose tissue with solid probes, and aspiration of the fatty emulsion. The solid metal probes are made to vibrate at ultrasonic frequencies (above 20 kHz) in order to induce their effects on the subcutaneous fat. The forward and backward movement of the probe is maximal at the tip where energy is focused. The emulsification occurs through three mechanisms: cavitation, mechanical and thermal. VASER is safer than previous UAL technologies because it uses solid probes, so the protective tumescent fluid is not withdrawn. The probes are smaller in diameter than the previously used so they deliver less energy and are safer. VASER liposuction takes longer time than standard suction assisted because of the extra step of delivering the ultrasonic waves.(A.E.Hoyos and P.M.Prendergast,2014)

2) **Laser-assisted:** It makes use of a neodymium:yttrium-aluminum-garnet laser to target adipocyte membranes to emulsify fat. Use of tumescent infiltrate solutions is required for proper operation of the laser and also to minimize blood loss and potential complications. It results in better hemostasis, better wound healing, and less surgical trauma in targeted tissue and less pain.
3) **Power-assisted:** This approach uses a power source to manipulate the cannula in action, rather than solely relying on the surgeon's arm, thereby limiting physician fatigue. A small motor, moves the 2-to4-mm cannula tip in a forward and backward motion. The cannulas are small, flexible, and comparable in length and diameter to standard suction-assisted liposuction cannulas. Power-assisted liposuction is effective for large volume fat removal, fibrous areas, and revisions. This modality is typically used in conjunction with the tumescent or superwet technique. The main disadvantages of this modality include excessive cannula vibration and noise from the power system. (J.Wells and K.Hurvitz,2011)
4) **J-Plasma:** It is a revolutionary treatment that uses helium gas and radiofrequency energy to create cold helium plasma, which is injected and used to treat the underside of the skin. This instantly firms up the skin as the J-Plasma device is inserted subdermally through small incisions. It is a minimally invasive procedure for skin tightening. J-Plasma is considered a form of radiofrequency that can be used with or without liposuction. It has a high level of precision in eliminating unintended tissue trauma. A focused stream of low-current cold plasma is created resulting in shrinkage of the skin undersurface causing its firmness.

Liposuction Cannulas:

A liposuction cannula is a hollow rod with a blunt to sharp tip and side openings through which fat is detached from subcutaneous skin and evacuated into the aspirator. Cannula designs vary by dimension, length, and tip shape. Cannulas with sharp or pointed tips are easier to manipulate but are more likely to damage the surrounding tissue. By contrast, blunt-tipped cannulas require more physical exertion, causing more physician fatigue. Many cannulas have more than one opening, in various configurations, at or near the tip. Multiple openings facilitate fat extraction and reduce tissue damage by minimizing repeated movement over a given area. The design, size, and length of the liposuction cannula vary greatly, depending on the area(s) to be suctioned, the type of liposuction performed, and the physician's preference. Cannula diameters typically range from 2 to 6mm and are available in a variety of lengths. No one cannula is appropriate for all procedures, patients, or surgeons. Specialised cannulas are used in Power-assisted and Ultrasound assisted liposuction. Cannulas may be straight or curved. The latest cannula is the twelve hole cannula which is used in high definition liposuction. It fascilitates the suction of large areas but can easily results in depressions and irregularities if uncontrolled. (A.Matarasso and S.Levine,2013)

Patient Selection:

Liposuction is generally an elective procedure, the liposuction patient must be assessed using the same standards as those used for anyone who is undergoing any type of surgery, including a complete preoperative history and physical examination. One of the most important aspects in the success of any surgical procedure is the physical condition of the patient at the time of surgery. Proper patient selection, preoperative assessment and optimizing the technique used are the key to results perfection. Not all patients are appropriate liposuction candidates, in particular, patients with minimal localized adiposity, patients with existing medical conditions that preclude surgical intervention (e.g., certain blood dyscrasias, risk for hernia), patients with unrealistic expectations, and youths and adolescents.

- Localized Adiposity: Liposuction is a very effective treatment for recontouring localized fat deposits of the trunk, abdomen, and thighs. It was made for these cases as it is a body contouring operation and not a weight reduction operation. It has also been used to a more limited extent to correct areas on the upper arms and breasts as an adjunct to reduction mammaplasty or treatment for gynecomastia, or as part of the face lift procedure for recontouring the neck. Liposuction is also used in reconstruction cases for flap defattening. When considering potential candidates for liposuction, patients who endeavor to improve their appearance through diet, exercise, and a healthy lifestyle are more likely to be satisfied with their long-term postoperative results.

- **Obesity:**
  Liposuction is not considered a standard treatment for obesity. (Phillip C. Haeck, et. al, 2009)

Patients who are not liposuction candidates should continue diet and exercise routines, seek medical intervention to treat an existing condition, consider bariatric evaluation, or, in the case of patients who have unrealistic expectations about their condition or potential outcomes, be referred for a psychiatric or psychological evaluation.

The service provider training and qualifications:

A certified ESPRS accredited plastic surgeon.

Facility Selection and accreditation:

The physician should determine the appropriate surgical technique and surgical facility in which to perform liposuction after considering the patient's overall health and body areas to be liposuctioned. Hospitalization may be required in select cases to ensure patient safety. Plastic surgery, including liposuction, performed under anesthesia, other than minor local anesthesia and/or minimal oral tranquilization, should be performed in a surgical facility that meets certain criteria of accreditation and certification and it has to be licensed. Liposuction is an operation and it should be done at a hospital under strict aseptic conditions to decrease risks and prevent complications. (J.Wells and K.Hurvitz,2011)

Anesthesia:

Various types of anesthesia or anesthesia combinations are appropriate for liposuction, depending on the overall health of the patient, the estimated volume of aspirate to be removed, and the postoperative dismissal plan. The surgeon has the primary responsibility for deciding on the type of anesthesia to be used and for providing and/or supervising anesthesia delivery. Parenteral sedation ,regional anesthesia, dissociative drugs, spinal anesthesia, epidural anesthesia, and general anesthesia may be administered by a qualified physician or anesthesiologist, a certified registered nurse anesthetist under physician supervision, a certified anesthesia assistant, or another qualified health care provider under the supervision of a qualified physician. The responsible physician should be physically present in the operating room throughout anesthesia delivery, except when topical or local anesthesia is administered. Although no evidence supports the use of any single technique, the American Society of Plastic Surgeons Practice Advisory recommends avoiding neuraxial anesthesia (i.e., spinal, epidural) in office-based settings because of potential hypotension and volume overload issues. (A.Matarasso and S.Levine,2013)

In small-volume liposuction, infiltrate solutions containing local anesthetic agents may be sufficient to provide adequate pain relief without the need for additional anesthesia measures. Plastic surgeons should recognize the definitions of the American Society of Anesthesiologists regarding the types and levels of sedation and analgesia. These definitions comprise a continuum of levels ranging from minimal sedation (anxiolysis) to general anesthesia. General anesthesia can be used safely & has advantages for more complex liposuction procedures that include precise dosing, controlled patient movement, and airway management.
Studies indicate that epidural anesthesia combined with the infusion of anesthetic infiltrate provides patients with a consistent intraoperative comfort level.
Moderate sedation/analgesia augments the patient's comfort level and is an effective adjunct to anesthetic infiltrate solutions. (C.T.Chia,et.al,2017)

Patient assessment & Preoperative preparations:

Medical History: Taking thorough medical history from each patient is very important as many patients take vitamins, minerals, and supplements and do not report this to their practitioner, as they feel they are inconsequential. Stopping all nonessential agents before surgery can reduce the risk of a bleeding-related complication. An increasing percentage of the population use at least one psychotropic drug. These medications, along with others, can compete with lidocaine for metabolism in the liver, increasing the risk of toxicity. Drugs that potentially interfere with lidocaine metabolism should be discontinued at least 2 weeks before using tumescent technique for local anesthesia when

high doses of lidocaine are anticipated. Anticoagulating drugs should be stopped at least five days before surgery, which differs according to the drug.

Smoking is an independent risk factor for wound healing complications. The ameliorating effects of cessation are supported by Level I evidence, which suggests that the optimal duration of preoperative cessation of any form of nicotine is 4 weeks or longer. Diabetes mellitus is another risk factor for wound healing.

Routine preoperative laboratory investigations are done for each patient. Special investigations are added according to the medical condition of the patient.

Physical examination: A carefully directed history and physical examination should look for stigmata and sequelae of chronic disease. When examining the abdomen, the physician should pay particular attention to surgical scars as potential sources of hernias. Visceral perforations are most common in the small intestine in patients with abdominal hernias. Classification and documentation of the extent of diastasis recti and the visceral fat component is essential. Skin quantity and quality should be assessed, and differences between excisional procedures and liposuction should be discussed with the patients.

Routine preoperative laboratory investigations are done for each patient. Special investigations are added according to the medical condition of the patient.

Psychological assessment of patients having unrealistic demands is also important.

After full examination is done the surgeon discusses with the patient the liposuction sites and the amount that will be removed and decides the technique that will be used.

(C.T.Chia, et.al, 2017)

Informed Consent and Photography: Accurate photographic documentation has become essential in reconstructive and cosmetic plastic surgery for both clinical and scientific purposes. Patients appreciate seeing their before and after pictures.

Generally, "informed consent" requires that the patient be informed of the risks of treatment, the prognosis, and alternative treatments before consenting to treatment. Surgical consent has evolved and is not an event or a signature on a form but is an ongoing process of communication that continues throughout preoperative, perioperative, and postoperative care. High volume liposuction exceeding five liters should have a detailed written consent mentioning the increased risks and complications. It should be explained to the patient clearly.

Markings: Areas to be suctioned are typically marked in a topographic pattern. Zones of adherence and areas to avoid are marked with hash marks. Some authors advocate grid markings to standardize resection and reduce contour irregularities. They mark areas to be suctioned with minus signs while areas where fat will be injected with plus signs. Incisions should be placed in natural creases to minimize visibility, and some recommend placing bilateral access incisions asymmetrically to avoid scars that appear planned. Multiple-access incisions are used for almost all areas because removing all fat from a single access incision may lead to depressions around the access site and contour deformity. It is important to review all markings and access incision locations with patients in front of a mirror before they are medicated. At this point the surgeon decides the amount of infiltration fluid to be injected in each area and plans the body contouring process and the estimated amount to be suctioned.(C.T.Chia,et.al,2017)

Intraoperative care and Fluid management:

The patient should be placed in the appropriate position for access to the treatment site. If multiple areas are to be treated during a single operation, it is convenient to prepare the patient circumferentially so that all areas of the trunk and extremities may be treated without repeated preparation and repositioning. Surgeons should not be dissuaded from repositioning the patient intraoperatively to better treat and evaluate surgical progress and symmetry. Access to difficult areas such as flanks and thighs is dependent of the specific area and surgeon's preference for positioning.

Surgical procedures can be associated with several physiologic stressors, including the development of hypothermia, blood loss, malignant hyperthermia, and deep vein thrombosis. Taking precautions against the development of these specific physiologic stressors (i.e., warming the patient, using non–malignant hyperthermia–triggering anesthetics, and providing deep vein thrombosis/pulmonary embolism prophylaxis) and thoughtful decision-making regarding the type of anesthesia used, the safety of combining multiple procedures, and the duration of the procedure(s) are essential for maximizing patient safety during surgery and for enhancing postoperative recovery.

Profound hemodynamic and metabolic alterations can accompany large-volume liposuction. As such, physicians performing liposuction must understand the physiologic impact of the procedure and how to manage the fluid and electrolyte balance of a patient. Before large preinfiltrates came into common use, predictable responses to intravenous fluid administration made replacement a straightforward task. Large preinjectate techniques, such as the tumescent technique, complicate fluid replacement estimates. (**Phillip C. Haeck, et. al, 2009**)

Patients in the supine position should be properly positioned and padded on the operating table, with their knees slightly flexed so as to maximize blood flow through the popliteal vein. Special attention to positioning is also required for patients in the prone and decubitus positions. Intermittent pneumatic compression devices should be used intraoperatively to prevent deep vein thrombosis, particularly with patients at moderate to high risk of blood clots. (**R.E.Iverson, et.al, 2004**)

Because of the increasingly large volumes of infiltrate used in large-volume liposuction, careful attention must be paid to all fluid infused, whether as part of the infiltrate solution or as intravenous fluids administered during the procedure.

It is essential that all remaining fluid be accounted for when assessing total output, including the total volume of aspirate, any additional blood loss from concomitant procedures, and urine output. A urinary catheter is essential in these cases. It is estimated that 70 percent of the tumescent volume infiltrated is not aspirated when a liposuction procedure is completed. In light of this information, fluid resuscitation generally entails administration of maintenance fluid (the amount of fluid to be replaced from preoperative, nothing by-mouth status) and the subcutaneous infiltrate (70 percent presumed to be intravascular). Intravenous crystalloid may also be needed, depending on the amount of aspirate removed. To achieve all this properly good communication between the surgeon and the anesthesiologist is extremely important to keep the patient well monitored. (**Phillip C. Haeck, et. al, 2009**)

It is recommended that the intake and output of all fluids utilized in the operative and postoperative periods should be accurately monitored. Communication with the anesthesia about fluid management is critical even in the postoperative period. Fluid management and liposuction surgery must account for maintenance requirements, preexisting deficits, and intraoperative losses of aspirated tissue and third-space deficit. Preexisting fluid deficits should be minimal after an overnight fast. Blood loss estimates should be made and confirmed with preoperative and postoperative hemoglobin measurements. However, due to fluid shifts, hemoglobin levels may not be reliable during the first 24 hours postoperatively so doctors consider the Hematocrite value more accurate. Calculation of residual fluid volumes after liposuction is helpful in planning postoperative care. (**R.E.Iverson, et.al, 2004**)

Liposuction Volume:

After determining that the patient is an appropriate liposuction candidate, the surgeon must determine the appropriate volume of fat to remove. Advances in liposuction equipment and technique, along with reduced intraoperative blood loss, have made it possible for skilled surgeons to safely remove larger volumes of fat. Large-volume liposuction is defined as the removal of 5000 cc or greater of total aspirate during a single procedure. The risk of complications becomes higher as the volume of aspirate and the number of anatomical sites treated increase, and occasional deaths have been reported for patients undergoing large-volume liposuction. A detailed informed written consent including all the increased risks and complications should be explained to the patients undergoing high volume liposuction.

The patient's body mass index and the potential physiologic consequences of tissue loss should be considered to ensure that the volume of aspirate removed is proportional to the patient's overall size and medical condition. In some instances, it may be best to perform large-volume aspirations as separate serial procedures and to avoid combining additional procedures with large-volume liposuction.

It is important for physicians, to note the distinction between total fat removed and total aspirate removed. Total aspirate is defined as the combination of total fat and fluid that is removed during liposuction. When referring to liposuction volume, total aspirate should be the volume recorded. The American Society of Plastic Surgeons states that, regardless of the anesthetic method, large-volume liposuction (more than 5000cc of total aspirate) should be performed in an acute-care hospital or in a facility that is either accredited or licensed. Postoperative vital signs and urinary output should be monitored overnight in an appropriate facility by qualified and competent staff members who are familiar with the perioperative care of the liposuction patient.

(C.T.Chia, et.al, 2017).

Liposuction by board-certified plastic surgeons is safe, with a low risk of life-threatening complications. Traditional liposuction volume thresholds do not accurately convey individualized risk. The authors' risk assessment model demonstrates that volumes in excess of 100 ml per unit of body mass index confer an increased risk of complications.

Large infusion volumes have caused fluid shifts and lidocaine toxicity to become significant safety concerns. With liposuction being performed by untrained professionals, in nonaccredited office settings, and with continually increasing lipoaspirate volumes, reports of serious complications have surfaced, prompting scrutiny into procedural safety. The reported incidence of death after liposuction varies dramatically between 2.6 and 20.6 per 100,000.

Significant controversy continues to surround the maximum permissible lipoaspirate volume. There are currently no quantitative data to support a specific volume at which point liposuction is considered unsafe. The current American Society of Plastic Surgeons guidelines defines 5000 ml of aspirate as large-volume liposuction that likely portends increased procedural risk, despite concluding that "there is no scientific data available to support a specific volume maximum at which liposuction is no longer safe".

Advances in technique and a greater understanding of the physiologic fluid dynamics governing liposuction have allowed increasing volumes of lipoaspirate to be removed during a single surgical procedure. Despite these advances, no safe upper limit of total lipoaspirate volume has been elucidated. Instead, current patient safety advisories advise surgeons to formulate an overall impression of surgical risk based on patient body mass index and comorbidity burden. Such estimates are intrinsically subjective, preventing a precise quantification of risk to guide surgeon and patient decision-making. This study is the first attempt at identifying the risk of complications conferred by varying liposuction volumes. It is important to note that the American Society of Plastic Surgeons Safety Committee has recommended that patients who undergo large-volume liposuction should be

observed overnight in the inpatient setting for close postoperative monitoring of potential fluid and electrolyte imbalances. Despite the overall safety of liposuction, the need for evidence-based safety profiles for lipoaspirate volume became more apparent in the wake of several highly publicized reports of patient deaths following liposuction. (I.Chow,et.al,2015)

Postoperative Care:

Immediate postoperative care should include an assessment of fluid and electrolyte balance and the administration of replacement fluids, as needed. In addition, red blood cell loss needs to be assessed and replacement transfusions should be given, if needed. Patients who undergo large volume liposuction or multiple procedures should be warmed during recovery using appropriate warming methods. All patients who have received general anesthesia, regional anesthesia, or deep or moderate sedation should receive appropriate postanesthesia management.

Traditionally, immediate postoperative effective and prolonged use of elastic compression garments was advocated. The general rule of thumb was for patients to wear the garment for 1 week for every decade of life (40-year-old patients would wear garments for 4 weeks). Prolonged compression can cause skin creases, hyperpigmentation, pain, and swelling. Some ways to minimize swelling and postoperative compression include minimally traumatic surgical technique, not suturing the incisions as recommended by Toledo and Mauad and applying bulky absorbent dressings for the first 24 to 48 hours to allow the excess remnant fluid and serous reaction to flow out. (C.T.Chia,et.al,2017)

Pain management in the immediate postoperative period may require small doses of parenteral narcotics. The patient may be sent home with oral pain medication, which may be needed for several days. The need for pain medication should lessen after that time. The patient should be advised to immediately report any progressively worsening pain to the physician, as it may be indicative of infection or other complications. Early ambulation is highly recommended.

Long-term follow-up care includes assessment of postoperative recovery at regular intervals, depending on the extent of the procedure. This assessment should examine wound healing and scar maturation, and patient satisfaction. Correction of deformities and/or revisions should generally be undertaken at least 3 to 6 months after the original liposuction procedure to allow for tissue normalization. Deformities maybe corrected with repeat liposuction and/or fat grafts. (Phillip C. Haeck, et. al, 2009)

Safety of Combining Liposuction with other Procedures:

The cumulative effect of multiple procedures performed during a single operation may increase the potential likelihood that complications may develop. Although many combined plastic surgery procedures are routinely and safely performed in inpatient and outpatient surgical settings, some combination plastic surgery procedures are more controversial, particularly those involving liposuction. Serious complications have been reported when large-volume liposuction is combined with procedures such as abdominoplasty.

Restricting liposuction in combination with multiple unrelated procedures has been the topic of many debates, largely because the actual volume of liposuction aspirate that can be safely removed during a combined procedure is as yet unknown.

Individual patient circumstances may warrant performing liposuction as a separate procedure. When combining liposuction with other procedures and prolonging the surgery, it is recommended to decrease the amount that will be suctioned.

The most common combination is with abdominoplasty and with fat injection. (A.Matarasso and S.Levine,2013)

In 2018,B.L.Vieira,et.al, made a risk assessment Model of liposuction and lipoaspirate volume on complications of abdominoplasty and whether there is a safe limit in combined lipo-abdominoplasty.

They came to the conclusion that when done by board-certified plastic surgeons, abdominoplasty with truncal liposuction is safe, with fewer complications than abdominoplasty alone. Increasing the liposuction volume results in increased complications.

Combined abdominoplasty and liposuction of the abdomen and flank has been performed in a variety of iterations for over three decades and has become an increasingly common procedure. The combined strategy eliminates the need for a second procedure, and may decrease overall recover time, reduce costs, decrease reoperation rates, and increase patient satisfaction. However, despite growing popularity and potential benefits, the safety of the one-stage procedure has been the subject of debate, fueled by uninformed opinion and incongruent or inadequate scientific/safety data.

Early studies warned against combining liposuction of the anterior abdomen with abdominoplasty, because of concerns for increased risk of thrombotic or fat embolic complications, seroma, vascular disruption, and necrosis. These concerns have carried over to the present day, with articles in both the scientific and the lay press continuing to report concern for patient safety. The evolution of abdominoplasty now includes more aggressive trunk liposuction and the newer concept of lipoabdominoplasty.

Truncal liposuction is now considered a part of the abdominoplasty procedure.

Another very common procedure combined nowadays with liposuction is fat transfer or fat injection. Fat transfer may be performed as a primary procedure (**e.g., breast or buttock augmentation**), as an adjunct (**e.g., face-lift surgery or breast reconstruction**), or for the potential of "stem cell" therapy. (**B.L. Vieira,et al,2018**)

Reoperation: Patients who are to undergo secondary surgery to correct contour irregularities should be evaluated carefully and counseled to ascertain a concurrent goal for surgery. Previous surgical procedures should be considered and careful notation should be made to document the site of secondary surgery and the anticipated amount of secondary lipoaspirate or augmentation with dermal fat grafts of lipotransfer. Skin resection may be necessary for areas of inadequate skin retraction.

Patient Satisfaction: Physical outcome and ease of recovery are not the only factors that define patient and physician satisfaction, as successful body contouring surgery requires a patient to embrace positive lifestyle habits. The importance of patient education on postoperative alternatives in diet and exercise ultimately determines the relative success rate of the liposuction procedure. Patients who were committed to a positive lifestyle change or who were already cognizant and practicing a "healthy lifestyle" were found to have the highest self-assessment and satisfaction responses.

Self-evaluation for improvement: Physicians should be receptive to patient feedback and continually evaluate their results to ensure patient satisfaction. Refinements can be made at any stage in the perioperative and intraoperative process to achieve a successful liposuction outcome.(R.E.Iverson and V.S.Pao,2008)

Complications:

Serious medical complications are rare following liposuction, although their frequency may increase with the number of sites treated and the volume of fat aspirated. Liposuction-related complications range from relatively minor conditions to more serious or life-threatening events. Minor complications that resolve on their own or with little additional treatment include small hematomas, seromas, and minor contour irregularities. More severe complications include skin perforation, major contour defects, skin necrosis, thermal injury, vital organ injury, adverse anesthesia reaction, major hemorrhage, ischemic optic neuropathy, deep vein thrombosis, pulmonary embolism, and fat

embolism. Very severe complications may require additional surgery or hospitalization and may result in death.(Phillip C. Haeck, et. al, 2009)

Cosmetic Procedure	Minor Complications		Major complications	
	Hematoma(%)	Infection(%)	VTE (%)	Mortality
Abdominoplasty	2	2-7	0.4	1:13,000
Buttock augmentation	NR	NR	NR	1:20,000
Liposuction	0.15	0.10	<0.1	1.3:50,000
Face	1.5	0.3	<0.1	NR
Breast	1.5	1.1	<0.1	NR

VTE, venous thromboembolism ; NR, not reported
Table (3): Complications and Mortality Rates in Cosmetic Surgery (R.J.Rohrich,et.al,2020)

Mortality from liposuction has decreased dramatically since qualified individuals were properly trained. With proper training in qualified individuals, the mortality rate dropped drastically, and liposuction is now considered one of the safest cosmetic procedures performed. In settings where the doctor is not qualified, the facility not accredited and recommendations are not followed, the morbidity and mortality rates are higher. With the increase in cosmetic operations performed annually, periodic evaluation of safety is valuable for providing consistent outcomes. Identifying risk factors and defining procedure-specific complication rates has helped guide patient selection and patient education. (R.J.Rohrich, et.al, 2020)

General Liposuction Complications are:

- **Bleeding**: Excessive bleeding during or following liposuction is rare. Causes may be due to incompetent surgeons, patients with undiscovered bleeding disorders or who did not stop their anticoagulation drugs, superficial dry liposuction or suction of massive amounts. Using the tumescent technique, saline causes profound vasoconstriction so the emulsification and removal of fat is occurring in an almost bloodless field.
  Bloody aspirate may be produced in very fibrous areas such as the back, upper abdomen, or male breasts. If the aspirate is excessively bloody, the area should be avoided or more tumescent fluid should be infiltrated.
  Patients who potentially have a bleeding abnormality must be excluded by preoperative investigations. Sequelae of intraoperative and postoperative bleeding depend on the volume of blood loss, condition of the patient, treatment are, and presence of drains and compression. The application of compression garments is essential immediately postoperatively in order to facilitate hemostasis and compress small vessles.
  Some ecchymosis is normal, extensive ecchymosis may occur in areas more prone to have bruising, particularly in the thighs. Resolution of ecchymosis occurs without intervention. Small hematomas resolve spontaneously while large hematomas need to be evacuated.(A.E.Hoyos and P.M.Prendergast,2014)
- **Infection**: Infection can be one of the more serious complications of liposuction. Localized wound infection can progress, sometimes rapidly, causing serious to fatal outcomes. The most serious of these complications include toxic shock and necrotizing fasciitis. This may be due to the defective operation setting, or non compliance of the patient. Aggressive management of the initial infection can forestall more serious complications. No evidence was found regarding the use of antibiotic prophylaxis in liposuction cases; therefore, the use of prophylactic antibiotics is a decision that is best made by the physician. It is essential that wounds be kept clean and that any change in the wound site is reported to the physician

immediately. Sterile technique using properly sterilized instruments in appropriately selected patients serves to keep the incidence of infection very low. A superficial infection around the incision site will manifest as blanching erythema, heat, and tenderness. Necrotizing fasciitis represents a severe life-threatening streotococcal group A infection or mixed bacterial infection that leads to thrombosis of the subcutaneous vessles and spreading gangrene. (Phillip C. Haeck, et.al, 2009)

- Necrosis: Necrosis of tissue and skin may occur following aggressive superficial lipoplasty if the subdermal vascular plexus is compromised. This is more likely if the patient is a smoker,in secondary cases ,or if sharp cannulae are used. In order to minimize incidence of necrosis, superficial maneuvers are limited. It is more common with laser or VASER assisted liposuction. It may be caused by burns due to the heat delivered to the tissue that cause their damage if not properly controlled.
- Seroma: A seroma is an abnormal collection of fluid in the subcutaneous tissue that occurs as a result of trauma, burns or friction following lipoplasty, and is expanding in size. It is usually inflammatory exudates but may also be comprised of lymph. Seromas are more common in overweight or obese patients with large abdomens. Diagnosis is either by clinical examination or ultrasound. Early seromas can be drained by needle aspiration followed by compression. Drainage may be required every few days till it resolves. Ultrasound guided drainage is more accurate than blind aspiration.
- Thromboembolism: Pulmonary embolism results from one or a combination of three mechanisms: venous stasis, activation of blood coagulation, or injury to the vascular endothelium. One of the most important ways of preventing thromboembolism is to adequately assess the patient regarding his or her risk for such events. The patient should be assessed for genetic and acquired conditions that predispose him or her to coagulation disorders (**e.g. the factor V Leiden mutation, use of oral contraceptives, or hormone replacement therapy**).
  Once the patient's relative risk is determined, appropriate prophylaxis can be implemented. Signs and symptoms of deep venous thrombosis include calf pain, leg edema, and venous engorgement. Signs and symptoms of pulmonary embolism include chest pain, dyspnea hemoptysis, tachycardia, tachypnea, altered mental status, rales, rhonchi, and decreased oxygen saturation.
- **Fat embolism**: Fat emboli, although somewhat less common than pulmonary emboli, have been implicated in liposuction death. There are two theories as to the origin of fat emboli, one mechanical and the other biochemical. In liposuction cases, a mechanical blockage can occur when vessel rupture and adipocyte damage allows globules of triglycerides to enter into venous circulation. The fat globules are too large to pass through the pulmonary capillaries, where they become trapped. Symptoms of a fat embolus include tachycardia, tachypnea, elevated temperature, hypoxemia, hypocapnia, thrombocytopenia, and occasionally mild neurologic symptoms. It is essential to distinguish fat embolus from pulmonary embolus because the treatment is different. Fat embolism is related to the area suctioned or injected especially the buttocks, and is the result of wrong technique and plane of suction. (**A.E.Hoyos and P.M.Prendergast,2014**).
- **Visceral Perforation**: Perforation of the probe or cannula through the abdominal wall can occur during any lipoplasty procedure on the abdomen.
  Several cases of intestinal perforation have been reported. It causes peritonitis, and may lead to septic shock, necrotizing fasciitis ,and death.
  A perforation can be the result of a cannula passing through a defect in the abdominal wall, into an undiagnosed abdominal wall hernia, or careless movement of the cannula in a vertical, rather than horizontal direction. An ultrasound scan of the anterior abdominal wall should be performed preoperatively if a hernia is suspected or if a scar is tethered or depressed. The peritoneum could be adherent to the skin in these cases. Intraoperatively the

nondominant hand should always feel the tip of the probe or cannula as gentle strokes are made through the tissues. Particular care should be taken near the costal margin to avoid penetration of the thoracic cavity.

- **Lidocaine Toxicity**: Lidocaine can be administered safely in tumescent anesthesia in doses up to 35 mg\kg .Toxicity occurs when lidocaine is absorbed systemically and appears as perioral tingling, numbness of the tongue, dizziness, nausea and vomiting. With increasing plasma levels, cardiac toxicity can occur. The treatment is supportive. It is important to remember that since lidocaine is absorbed very slowly from the fat compartment, peak plasma concentrations occur only 12-18 hours after administration. The rapid infiltration of the wetting solution may increase serum levels of lidocaine since it takes 12-15 minutes for epinephrine to cause vasoconstriction.
  Apart from toxicity allergies and even anaphylaxis can occur. (A.E.Hoyos and P.M.Prendergast, 2014)

Anaesthetic pulmonary complications :

Patients who had bariatric sleeve operations frequently have severe forms of reflux oesophigitis which may lead to aspiration pneumonitis and Mendlsen syndrome , so preoperative nasogastric tube insertion is important during operation with continuous aspiration of gastric fluids.

Specific Energy-assisted Liposuction complications:

The vibratory excursion of the tip of the ultrasonic probe can also generate heat, particularly if it comes in contact with the skin or if the probe is not in constant motion through the tissues. This can also occur with the laser probe. Depending on the port location burns can be divided as follows:

a) Pre-port burn: If the proximal end of the probe rests on the skin during ultrasound delivery, the vibration of the probe can lead to significant burns.
b) Port burn: Transmission of vibration from the probe through the skin port onto the skin can result in a burn around the incision site.
c) Post-port burn: this is produced when the probe tip abuts the dermis of the skin from inside. This can occur by an end-hit or a parallel-hit.

Complications related to High-definition body sculpturing:

High definition body sculpturing requires great attention to details, from the preoperative assessment and marking to the intraoperative technique and postoperative care. The technique depends on the contouring of the body by selective removal of fat resulting in accentuation of the underlying muscles, tendons and bony landmarks, which shows the beauty of the sculptured body. Too much (which is mostly the case) or too little sculpturing may lead not only to a suboptimal result at best but also to complications:-

- **Contour irregularities**: If irregularities are present preoperatively it has to be documented and markings for liposuction should be precise. If markings are inaccurate, a concavity, depression or groove will be sculptured in the wrong area. The result is an unsightly defect rather than improved muscular definition.
- **Skin Retraction**: Although controlled, uniform skin retraction is one of the key elements in high-definition body sculpturing, it can also lead to unwanted physical defects. This occurs when garments and foam are not routinely used and the patient does not correctly follow postoperative instructions.
- **Asymmetry:** If there is symmetry preoperatively, then efforts should be made intraoperatively to remove equal volumes from both sides. Preoperative asymmetries should be documented and brought to the attention of the patient.

Asymmetry due to uneven fat distribution can be improved or corrected by removing more fat on the larger side or shifting fat to areas where it is deficient.

- **Unnatural appearance**: Creating a frame around muscle groups with linear depressions will cause "wood-like" appearance. Also if the appearance of muscles is etched upon an abdomen in an overweight patient, the result is the so called "Ninja turtle" man. It is appropriate to treat the torso circumferentially, including the upper arms, to obtain a harmonious and natural appearance.
- **Fibrosis and Nodularity**: Some inflammatory and fibrotic reaction is inevitable following ultrasound assisted superficial high-definition lipoplasty. This can be kept to a minimum by avoiding unnecessary or excessive delivery of ultrasound to the tissues, as well as minimal use of traumatic cannulae or aggressive technique. The compression garment should be smoothly placed over the skin to prevent subcutaneous fibrosis leading to irregularities.
- **Unsightly scar:** Consideration should be given to the placement of incisions, especially in patients who are prone to hypertrophic scars or hyperpigmentation. Usually incisions can be hidden in the pubic area, umbilicus, axillary creases, and inframammary folds.
- **Loose skin:** Skin laxity following any form of lipoplasty may occur if the skin does not fully retract to fit the new contours when subcutaneous fat is removed. This is more likely in certain areas like lower abdomen, periumbilical area, upper arm and above the knees. This should be explained to the patients in the preoperative assessment. Patients with poor skin tone, striae, and large volumes of fat are at risk of postoperative looseness. Excisional procedures should be discussed in these patients.
- **Burns:** Pre-port, port and post-port burns are possible complications. The need for thorough superficial and deep emulsification of fat means the energy delivered to the tissues is substantial. However it should not exceed 2 min of ultrasound delivery per 100 ml of tumescent fluid infiltrated. (A.E.Hoyos and P.M.Prendergast, 2014)

Media Related Complications:

Physicians nowadays use social media for advertising their work. Facebook and Instagram pages are now very common and easy to follow. Patients review the doctor's page to see his results. Before and after pictures are viewed. Even videos showing intraoperative steps of the operation are available.
Also a lot of doctors appear on television or live through their sites to explain procedures and answer the viewers questions.
All this has put a lot of pressure on the young surgeons who are just starting. It has put the standards high and made it more competitive. They pay a lot in advertising their work and they want to work more to be able to cover all the expenses.
The patients' demands increased and they have unrealistic expectations as they are able to see results and compare them on the internet.
This results in doctors taking more risks on the expense of the patient's overall health.
This is why serious complications are more seen in plastic surgery practice nowadays.
Optimizing patient safety and outcomes should remain at the forefront of plastic surgery today. (R.J.Rohrich, et.al, 2020)

Liposuction Guidelines in Egypt

Only ESPRS certified plastic surgeon shall do this procedure after careful evaluation of the patient psychologically and physically.

Preoperative evaluation:

1- Examination of the patient to assess general condition as regard the vital organs and complete laboratory and radiological investigation.
2- Assess the abdominal scars, hernia and divarication of the recti to avoid intestinal injury.
3- Reflux oesophagitis in patients after bariatric surgery is common and may cause postoperative acid pneumonitis and ARDS due to intraoperative inhalation of the Gastric acid. So intraoperative continuous gastric aspiration is recommended.
4- Assess skin quality and patient hygiene to prevent wound problems.
5- Prepare blood transfusion if indicated.
6- Immediate application of garments is vital after liposuction to prevent bleeding and fluid loss.
7- Treat fungus infection and skin eczema in sites of skin incisions.

Liposuction Technique:

- No one single liposuction technique is best suited for all patients in all circumstances. Factors such as the patient's overall health, the patient's BMI, the estimated volume of aspirate to be removed, the number of sites to be addressed, and any other concomitant procedures to be performed should be considered by the surgeon to determine the best technique for the individual patient.
- Due to the amount of blood loss associated with the dry technique, its use is not recommended except in limited applications with a total aspirate volume 100 cc.
- The dry technique should never be used in conjunction with ultrasound-assisted liposuction. Always use tumescence.
- Assisted techniques that produce heat such as Laser and VASER should be carefully used by a trained skilled plastic surgeon, to prevent complications.
- The benefits of performing liposuction while the patient is awake and standing are not currently supported by clinical studies, and this procedure may compromise patient safety.
- High definition body sculpturing is an artistic technique that requires a lot of attention to all the details.

Liposuction Cannulas:

- There is no single cannula suitable for all patients in all circumstances. Factors such as the patient's overall health, the estimated volume of the aspirate to be removed, the areas of the body to be treated, the number of sites to be addressed, the technique chosen (i.e., suction-assisted, power-assisted, or ultrasound-assisted), and physician preference determine the cannula best suited for the individual patient.
- Cannulas vary in size, shape, length and number of holes.

Anesthetic Infiltrate Solution:

- In small-volume liposuction, infiltrate solutions containing local anesthetic agents may be sufficient to provide adequate pain relief without the need for additional anesthesia measures. The patient or the surgeon may prefer the use of sedation or general anesthesia even with small volumes of liposuction.
- Lidocaine wetting solutions have the potential to cause systemic toxicity when administered to large or multiple regions of the body. Preventive measures include the following: 1) Limit the lidocaine dose to 35 mg/kg. This level may not be safe in patients with low protein levels and other medical conditions where the metabolic byproducts of lidocaine breakdown may reach problematic levels. 2) Calculate the dose for total body weight. 3) Reduce the concentration of lidocaine when necessary (e.g., depending on the site of infiltration). 4) Use the superwet rather than the tumescent technique. 5) Consider avoiding the use of lidocaine when general or regional anesthesia is used.
- Epinephrine use should be avoided in patients who present with pheochromocytoma, hyperthyroidism, severe hypertension, cardiac disease, or peripheral vascular disease. In addition, cardiac arrhythmias can occur in predisposed individuals or when epinephrine is used with halothane anesthesia. The surgeon must carefully evaluate these types of patients before performing liposuction.
- Consider staging the infiltration of multiple anatomical sites to reduce the possibility of an excess epinephrine effect.

Type of Anesthesia:

- A physician should have the primary responsibility for providing and/ or supervising anesthesia. All anesthesias should be ordered by a physician.
- General anesthesia can be used safely for liposuction procedures.
- General anesthesia has advantages for more complex liposuction procedures that include precise dosing, controlled patient movement, and airway management.
- Epidural and spinal anesthesia is discouraged in the ambulatory setting because of the possibility of vasodilatation, hypotension, and fluid overload.
- Moderate sedation/analgesia augments the patient's comfort level and is an effective adjunct to anesthetic infiltrate solutions.

Patient Selection:

- Even though liposuction is generally an elective procedure, the liposuction patient must be assessed using the same standards as those used for anyone who is undergoing any type of surgery, including a complete preoperative history and physical examination.
- BMI is a good method with which to assess a patient's relative risks and benefits for liposuction.
- In obese patients receiving large-volume liposuction, it may be necessary to modify the anesthetic infiltrate solution to prevent lidocaine toxicity. In those cases liposuction should be done in staged procedures.
- Not all patients are appropriate liposuction candidates, in particular, patients with minimal localized adiposity, patients with existing medical conditions that preclude surgical intervention (e.g., certain blood dyscrasias, risk for hernia), patients with unrealistic expectations, and youths and adolescents.

Liposuction technique:

- Large-volume liposuction is better avoided (>5000 cc of total aspirate in a single session), more than 7000 cc is dangerous and not recommended.
- Proper patient's positioning during the procedure (jackknife).
- Always stay subcutaneous.
- Use wide bore blunt curved cannulas (at least 4 mm). Basket cannulas are preferable.
- Always feel the tip of your cannula.
- The use of expansion vibration lipofilling technique, if available.
- Keep the continuous motion.
- Although it is difficult to objectively quantify the maximal fill volume, we equate the feel of tissues like that achieved during tumescent infiltration.
- Avoid high recipient site pressure (fat exiting the injection sites).
- **The use of VASER-lipectomy is recommended in:**
    1. All redo or revision cases.
    2. All males' cases especially those with mild infra-umbilical redundancy.
    3. All gynecomastia cases. While VASER does not abolish the gland completely, the energy produced together with mechanical trauma causes much gland disruption and separation facilitating its minor-incision removal.

Fluid Management:

- A data sheet should be used to facilitate communication.
- The intake and output of all fluids used in the operative and postoperative periods should be monitored accurately.
- Communication with the anesthesia doctor about fluid management is critical.
- Fluid management and liposuction surgery must account for preexisting deficits (i.e., created by a fasting state), maintenance requirements (based on vital signs and urine output), and intraoperative losses of aspirated tissue and third-space deficit.
- Blood loss estimates should be made and confirmed with preoperative and postoperative hemoglobin measurements. However, because of fluid shifts, hemoglobin levels may not be reliable during the first 24 hr postoperatively.
  Use Hematocrite value instead.
- Calculation of residual fluid volumes after liposuction is helpful in planning postoperative care.
- Avoid early patient discharge in liposuction unless the general condition of the patient permits.
- In case of suspicious abdominal perforation consult general surgeon with adequate experience and early exploration is mandatory in suspected cases.

Combining Procedures:

- Large-volume liposuction combined with certain other procedures (e.g., abdominoplasty) has resulted in serious complications, and such combinations should be avoided.

Complications:

Physicians should be aware of the signs and symptoms of the before mentioned complications that may arise during or after liposuction. He should be ready for the proper management immediately.

Hospital Selection:

The physician should determine the appropriate surgical technique and surgical facility in which to perform liposuction after considering the patient's overall health and body areas to be liposuctioned. Hospitalization may be required in selected cases to ensure patient safety. The hospital must be accredited and licensed to ensure all safety measures.
Early discharge of patients has resulted in many complications and should be considered .

Physician training and qualifications:

It is the role of the syndicate to ensure that liposuction operations are only done by qualified plastic surgeons. Unqualified personnel or non-plastic surgery doctors should be banned from performing liposuction.

Media and Advertisement:

Plastic Surgery operations are not products to be sold. There should be strict rules to limit what is published through the social media.
The patient must be consented before putting their before and after pictures on the internet. The identity and the private parts of the patient should be hidden.
The control of the media and advertisement is of utmost importance.

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الموافقة الخطية المستنيرة على اجراء عملية جراحية لشفط الدهون
Liposuction

المريض:

أقر أنا الموقع أدناه أنني موافق على إجراء التداخل الجراحي المبين عاليه، وأقر أن الطبيب قد قام بشرح طبيعة ذلك التداخل الجراحي والهدف منه، كما أوضح البدائل المتاحة لهذا الإجراء الجراحي. كما أقر أنني على كامل المعرفة بالمضاعفات الطبية والجراحية ممكنة الحدوث من جرّاء تلك العملية.

❖ **معلومات عامه:**

1. لقد شرح لي الطبيب كافة الخطوات من الفتح الجراحي والخيوط الجراحية وخطوات الجراحة. كما أنني اتعهد بالالتزام بتوصيات الطبيب من ضرورة لبس المشد المناسب فترة لا تقل عن شهر ونصف من تاريخ الجراحة. وفى حالة إخلالي بمتابعة اوامر الطبيب فأن الطبيب والفريق الطبي المساعد له غير مسئولين عن نتيجة الجراحة.
2. أفضل المرشحين لشفط الدهون هم الأفراد ذوي الوزن الطبيعي نسبيًا والذين لديهم دهون زائدة على وجه الخصوص في بعض مناطق الجسم .الجلد المرن سيؤدي إلى نتيجة نهائية أفضل بعد شفط الدهون .الجلد الذي ترهل وبه علامات التمدد نتيجه زياده وفقدان الوزن المتكرر، أو نتيجه الشيخوخة الطبيعية لن يعيد تشكيل نفسه وقد تتطلب تقنيات جراحية إضافية لإزالة وشد الجلد الزائد.
3. شفط الدهون في حد ذاته لن يحسن مناطق التعرجات التى تعرف باسم "السيلوليت".
4. أتفهم تماما حدوث تورم بالجزء الذي تم الشفط منه وكذا الجزء المحقون مع احتمال حدوث ازرقاق والذي قد يستمر لفترة لا تقل عن أسبوعين.
5. في بعض الحالات، يمكن استخدام تقنية خاصة تنبعث منها طاقة فوق صوتية. هذه تقنية تعرف باسم استنصال الدهون بمساعدة الموجات فوق الصوتية. اعتمادًا على احتياجاتك، قد يقوم الجراح بالشفط بالطريقة التقليدية بجهاز شفط الدهون، أو بالاشتراك مع استنصال الدهون بمساعدة الموجات فوق الصوتية.
6. تتضمن تقنية شفط الدهون، حقن السوائل المحتوية على مخدر موضعي مخفف وأدرينالين في المناطق المطلوب شفطها، حتى تقلل من فقدان الدم وكدمات ما بعد الجراحة.

تم الشرح والتوضيح التام ان النتيجة النهائية لعمليات شفط الدهون لا تظهر الا بعد مرور 6 أشهر على الاقل من تاريخ الجراحة.

بدائل علاجيه عدم التدخل الجراحي. النظام الغذائي وممارسة الرياضة قد يكون مفيدًا في تقليل الدهون الزائدة في الجسم بشكل عام. إزالة الجلد الزائد والأنسجة الدهنية مباشرة. يكون ضروريًا بالإضافة إلى شفط الدهون لدى بعض المرضى.

❖ **مضاعفات خاصة بذلك الإجراء الجراحي:**

1. فقد بالإحساس العصبي بالجلد موضع الجراحة لمده 3 شهور.
2. تجمع سوائل (seroma): قد يحدث تراكم السوائل بين الجلد والأنسجة الكامنة بعد الجراحة. في حالة حدوث هذه المشكلة، قد تتطلب إجراءات إضافية لتصريف السوائل.
3. عدم انتظام سطح وشكل ولون الجلد موضع الجراحة، وعدم تماثل الشكل عقب الجراحة.
4. وجود تحجر بالأنسجة والدهون أسفل موضع الجراحة.
5. عند حدوث زيادة في الوزن قد يحدث عدم استواء في الجزء الذي تم الشفط منه وقد تحتاج لتدخل اخر.
6. استنصال الدهون بمساعدة الموجات فوق الصوتية: نادرا ما يؤدى الى حروق بالجلد
7. من الجائز الشعور بعدم الرضا من الشكل النهائي عقب الجراحة.
8. التورم المستمر)الوذمة اللمفية :(يمكن أن يحدث التورم المستمر في الساقين بعد الجراحة.
9. على الرغم من توقع نتائج جيدة، لا يوجد ضمان أو ضمان صريح أو ضمني، على النتائج التي يمكن الحصول عليها.
10. قد تجد قطعة من الدهون طريقها إلى مجرى الدم، نادره الحدوث وتؤدي إلى حالة خطيرة أو تهدد الحياة والسكتة الدماغية، والتهاب السحايا التهاب الدماغ، عدوى خطيرة، العمى أو فقدان الرؤية، أو الموت.

الموافقة الخطية المستنيرة على اجراء عملية جراحية لشفط الدهون
Liposuction

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

المقر بما فيه (الاسم ثلاثى): ..... ☐ذكر ☐ انثى السن : .....

الصـفـة : ☐المريض ☐ ولى الامر ☐ قريب ☐ أخرى .....

في حالة عدم توقيع المريض السبب ☐ قاصر ☐ قصور ذهنى ☐ غائب عن الوعى ☐ أخرى .....

التوقيع : ..... التاريخ : ..... الوقت : ..... رقم تحقيق الشخصية: .....

الطبيب المعالج:

- أقر بأنني قد قمت بشرح طبيعة الإجراء الجراحي المقرر للمريض والبدائل العلاجية له والمضاعفات الوارد حدوثها، كما أعطيت له الفرصة لطرح كافة الأسئلة المتعلقة بذلك الإجراء وقمت بالإجابة عليها.
- كما أقر أن العملية الجراحية عالية تهدف إلى علاج المريض عن طريق اجراء عملية جراحية تجميلية لشفط الدهون.
- كما أقر أنني قد قمت باتخاذ كافة الاحتياطات والفحوصات الطبية المعمول بها قبل إجراء هذا التداخل الجراحي من تحاليل طبية وأشعات مع التزامي الكامل بمتابعة المريض بعد إجراء الجراحة وحتى تمام الشفاء.

❖ **نوع التخدير المستخدم اثنـــاء الجراحة** ☐ تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ

المقر بما فيه:

الطبيب المعالج (الاسم الثلاثي): ..... التوقيع: ..... القسم التابع له: ..... التاريخ: ..... الوقت: .....

❖ **الشاهد/ المترجم على توقيع المريض**

الاسم : ..... التوقيع: ..... التاريخ: ..... الوقت: ..... الرقم القومى: .....

ملاحظات هامـــة:

- لا يسمح بإجراء أي تعديلات على هذا النموذج بعد الانتهاء من تعبئته وإنما يستبدل بنموذج آخر جديد.
- يحتفظ المريض أو من ينوب عنه بنسخة من هذا الإقراروبعتبر سارى لمدة اسبوع من تاريخ توقيع المريض

رقم تذكرة المريض .....

National Guidelines For Evaluation & Treatment of Craniofacial Anomalies

This document is considered the 2021 policy statement of the Egyptian Society of Plastic & Reconstructive Surgeons (ESPRS) to be nationally recognized and used as the general guidelines for management of craniofacial anomalies. The document should be reviewed periodically by a consensus panel to consider revisions needed to reflect advances in the concerned scientific knowledge base of this entity. This document can be found and downloaded from our website: www.esprs.org

INTRODUCTION

In Egypt, there are numerous types of congenital craniofacial anomalies, the most common of which is cleft lip and/or palate. The World Health Organization stated that we have almost an incidence of 1:500 of these cases, affecting approximately 2,000 newborns each year. Roughly one-half of these infants have associated malformations, either minor or major, occurring in conjunction with the cleft.

Although the incidence figures for more complex conditions or syndromes such as Apert syndrome, Crouzon syndrome, or craniofacial microsomia are much lower than that for cleft lip and/or palate, the impact of craniofacial birth differences must be viewed in terms of the aggregate effect rather than the impact of any single entity. This impact is twofold: the patient and family and on society as a whole.

The health and well-being of all of these children is dependent upon the clinical expertise of those who serve them. Quality of care positively impacts society as a whole by allowing the affected individual, through ongoing and excellent medical intervention, to make a positive contribution within their community.

Unlike cleft surgery, the craniofacial surgery is a relatively new specialty however the two specialties can be considered as one, as cleft disorders are part of the craniofacial syndromes.

In an effort to put forward general guidelines for treatment of these patients in Egypt to standardize the protocols of treatment for these conditions based on the recent literature but mostly adapted from the American Craniofacial and Cleft Palate Association which is considered the most prestigious body for this specialty. These guidelines are put forward to guide practitioners but not obligatory by anyway as certain situations require different options which will depend on the surgeons experience and workplace capability.

Team-work settings are crucial to achieve the ideal and best results in the field of management of craniofacial anomalies. The plastic surgeon is the key-stone of this team because most craniofacial syndromes are associated with soft tissues and skeletal facial anomalies which require through knowledge of the fine anatomy of the region and exposure techniques. Moreover, the cranio-maxillofacial injuries often need plastic surgeon as a keystone surgeon to systematize triage of injuries and prioritize surgical intervention between different specialties. Dedicated anesthesia team is vital to grant safe craniofacial

surgeries and treat possible risks including difficult intubations and abnormal respiratory pathway, blood loss, air embolism, and brain insults during surgery. Special fine instruments, micro motors, plates and screws etc are mandatory to introduce this specialty to any hospital.

Unfortunately, there are inadequate care results owing to diagnostic errors, unnecessary and poorly timed treatment, inappropriate or poorly performed procedures, and failure to recognize and treat the full spectrum of health problems associated with these differences.

Several fundamental principles underlie the recommendations of the Egyptian Society of Plastic and Reconstructive Surgeons regarding the optimal care of patients with craniofacial anomalies, regardless of the specific type of disorder:

- Management of patients with craniofacial anomalies is best provided by an interdisciplinary team of specialists who should have the sufficient clinical expertise in diagnosis and treatment.
- The optimal time for the first evaluation is within the first few weeks of life and, whenever possible.
- Parents/caregivers must be given information about recommended treatment procedures, timing, options, risk factors, benefits, and costs.
- Treatment plans should be developed and implemented on the basis of team recommendations.
- Complex diagnostic and surgical procedures should be restricted to centers with the appropriate facilities and experienced care providers.
- Evaluation of treatment outcomes must take into account the satisfaction and psychosocial well-being of the patient as well as effects on growth, function, and appearance.

This document is divided into three sections:

- Interdisciplinary teams: composition, qualifications, and general responsibilities
- Clinical evaluation and treatment plan, listing general guidelines and updated needed practices
- Quality management assessment

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INTERDISCIPLINARY TEAMS

Composition

The ideal staff of the interdisciplinary team may include but not be limited to individuals from the following areas of professional practice: plastic surgery, oral and maxillofacial surgery, anesthesiology, audiology, diagnostic medical imaging/radiology, genetic counseling, genetics/dysmorphology, neurology, neurosurgery, nursing, ophthalmology, orthodontics, otolaryngology, pediatrics, pediatric dentistry, physical anthropology, prosthodontics, psychiatry, psychology, social work, and speech-language pathology.

Qualifications of Team Members

It is essential that all team members be trained and experienced in the care of patients with craniofacial anomalies. The educational and experiential requirements for the specialties represented on teams are variously determined by their own specialty boards, professional associations, and national licensing authorities. The least eligible certification for those team members to practice management of craniofacial anomalies should not be less than the first postgraduate degree of the specialty. The team members should get their basic training in the field of management of craniofacial anomalies in any of the nationally known centers in that field which present frequent performance of operative procedures and adequate hospital facilities as university hospitals, teaching hospitals and institutions, and specialized medical centers.

Each team must take responsibility for assuring that team members not only possess appropriate and current credentials but also have requisite experience in evaluation and treatment of patients with craniofacial anomalies. Teams should assist members in keeping updated with their specialties by supporting and encouraging their participation in continuing education activities and attendance at professional meetings.

Team Responsibilities

Each patient seen by the team requires comprehensive, interdisciplinary treatment planning to achieve maximum habilitation with efficient use of parent and patient time and resources. The principal role of the interdisciplinary team is to provide integrated case management to assure quality and continuity of patient care and continuing follow-up. Each interdisciplinary team should do the following:

- Maintain records for each patient, including histories, diagnoses, reports of evaluations, treatment plans, reports of treatment, and supporting documentation, such as photographs, radiographs, dental models, and audiotaped speech recordings.
- Designate a coordinator who facilitates the function and efficiency of the team, ensures the provision of coordinated care for patients and families.
- Evaluate patients at regularly scheduled intervals.
- Hold regularly scheduled scientific meetings for discussion of findings, plans, and recommendations for each patient.
- Develop a longitudinal treatment plan for each patient that is modified as necessitated by craniofacial growth and development, treatment outcomes, and therapeutic advances.
- Communicate the treatment recommendations to each patient and family in written form as well as in face-to-face discussion.
- Provide updated information to families as the treatment plan unfolds and repeat information frequently enough to assure its assimilation.

- Maintain a reliable list of resources for any services that are either not provided by the team itself or are better provided at another geographic location.
- Provide educational programs for hospital personnel and primary care providers by addressing feeding and other critical aspects of early health care for children with craniofacial differences.

Actions through the neonatal period & infancy

During the neonatal period and infancy, one or more members of the interdisciplinary team should assume responsibility for providing the following services based on the needs of the infant. Subsequent evaluations should be scheduled at regular intervals. Needed practices during that period include:

- Providing a full pediatric evaluation including nutritional and feeding assessments, special feeding methods and devices, and growth and development.
- Continuing assessment of nutritional intake and weight gain during the first months of life.
- Assisting families with follow-up otolaryngological and/or audiological care.
- Assisting families with follow-up of the cardio- pulmonary conditions if the qinfant is at risk for respiratory obstruction or sleep apnea.
- Perform a genetic/dysmorphology screening with subsequent provision of, or referral for, a complete genetic evaluation as necessary.
- Consult with an appropriate dental specialist for cleft lip taping and/or pre-surgical orthopedics, including, but not limited to, nasal alveolar molding (NAM).

Clinical Evaluation & Treatment

Optimization of care requires regular team evaluations for setting and updating treatment plans and assessment of treatment outcomes. The following clinical practices should be approached for most of the patients havening craniofacial anomalies:

Audiologic Care

Individuals with craniofacial anomalies may have congenital conditions of the outer, middle, and/or inner ear structures. Those patients with a cleft palate are at an increased risk for middle ear disease. Hearing loss is a possible consequence of these ontological pathologies. The hearing loss may be permanent or intermittent, and it may range in degree from mild to severe. Hearing loss can have a detrimental effect on speech and language development, academic and vocational performance, and psychological and social well-being. For these reasons, individuals with a craniofacial anomaly require routine audiology surveillance.

- A complete audiological diagnostic evaluation should be performed by three months of age.
- The timing of audiological follow-up examinations should be determined on the basis of the child's history of ear disease and/or hearing loss. Audiological follow-up examinations should continue through adulthood as necessary.
- Audiological evaluations should begin at approximately nine months of age, and include a behavioral audiologic evaluation. Behavioral tests should be repeated at least every six to twelve months until the child is five years of age. After age five, if the hearing test is consistently within normal limit, then audiologic evaluations should be conducted annually until adolescence.
- If an individual with a craniofacial difference presents with a hearing loss of any type or degree (conductive, sensorineural, mixed, mild, moderate or severe) the schedule of audiological testing will change based on the audiologist's discretion.

- At each audiological visit, behavioral and physiologic audiological testing should be conducted. Behavioral evaluations include pure tone and, when possible, speech audiometry. Physiologic tests should include acoustic emittance testing (tympanometry and middle ear reflexes) and otoacoustic emissions (OAEs).
- All children undergoing myringotomies and placement of ventilation (pressure equalizing) tubes should be seen for audiologic assessment regularly.
- When a persistent hearing loss is identified, amplification (hearing aid, bone anchored hearing aids (BAHA), cochlear implants, and auditory training or FM systems) should be considered.
- When a hearing loss occurs in the presence of microtia or atresia of the outer or middle ear, either unilaterally or bilaterally, conventional bone conduction amplification should be considered. Depending upon the degree of loss, candidacy, and patient preference, a bone anchored hearing system (auditory osseointegrated implant) may be considered as a treatment option.
- Once amplification has been provided, routine audiologic follow-up is necessary to monitor hearing status and the function of the amplification system.

Cleft Lip/Palate Surgery

In addition to primary surgical closure of the cleft lip and cleft palate, many patients will require secondary surgical procedures involving the lip, nose, palate, and jaws. These procedures usually are staged from infancy through adulthood. In all cases, surgical techniques should be individualized according to the needs and condition of the patient.

Primary Cleft Lip/Palate Surgery:

- It is recommended that an experienced pediatric anesthesiologist must be present for all surgical procedures involving children.
- Surgical repair of the cleft lip is usually initiated within the first 12 months of life and may be performed as early as is considered safe for the infant who is usually at the age of 3 months with acceptable weight (4-6 kg) and hemoglobin level (9-10 g) with no concurrent infections.
- Pre-surgical maxillary orthopedics to improve the position of the maxillary alveolar segments and/or enhance the nasolabial aesthetic outcomes prior to surgical closure of the cleft lip may be indicated for some infants with wide clefts.
- Depending on the severity, primary nasal repair may be done at the time of the primary cleft lip repair.
- A preliminary cleft lip adhesion is a procedure that may be used in selected patients preceding definitive cleft lip repair.
- In the typically developing child, the cleft palate should be closed through the age of 12-18 months with good general condition.
- Repair of the cleft of the soft palate must include muscle reconstruction.
- Patients with submucous cleft palate should be monitored closely, and their submucous cleft palate should be repaired only if there is evidence of feeding, otologic, or speech problems.

Secondary Cleft Lip/Palate Surgery:

- Secondary cleft lip/palate surgery and/or surgery for velo-pharyngeal dysfunction should be performed only after evaluation (imaging) of the velo-pharyngeal mechanism during speech.

- Tonsillectomy and/or adenoidectomy should be discussed with the team ENT surgeon prior any secondary surgery
- Surgical or prosthetic closure of palatal fistulae may be needed if the fistulae are symptomatic.
- Timing of the bone grafting of the alveolar cleft should be determined by the stage of dental development. The graft should be placed before the eruption of the permanent maxillary teeth in the region of the cleft (7-9 years).
- Patients who have been lost to follow up or are late in presenting to the team for alveolar bone grafting, this surgery may need to take place after full eruption of the permanent teeth and should be determined in collaboration with the team orthodontist.
- Rhinoplasty and nasal septal surgery are usually advocated after completion of nasal growth.

Craniofacial Surgery and MaxillofacialSurgery

The complex nature of many types of craniofacial anomalies often necessitates multiple operative procedures at different stages of development. Reduction of morbidity and mortality from craniofacial operations requires establishment of a dedicated surgical team, frequent performance of operative procedures by that team, and adequate hospital facilities. Long-term follow-up is necessary for these patients even when the intervention has been successful with respect to the anatomical difference.

- Initial evaluation of cranial vault conditions should include a pertinent history and physical examination by team members who are specialists, including, but not limited to, genetics/dysmorphology, neurosurgery, ophthalmology, and craniofacial surgery.
- The specific components of the pre-, peri-, and post- operative evaluations of craniofacial surgery should be based upon the type of the anomaly and the craniofacial zone(s) affected.
- For patients with isolated orbitocranial anomalies, including anomalies of shape and orbital position, the initial evaluation should include: pertinent history and physical examination by team members who are specialists, including, but not limited to, genetics/dysmorphology, neurosurgery, ophthalmology, and craniofacial surgery
- Timing of surgery, including distraction osteogenesis, for orbital craniofacial anomalies depends on associated soft tissue anomalies, functional impairments, and psychosocial concerns.
- An experienced pediatric anesthesiologist must be present for all surgical procedures involving children.
- Appropriate intensive care facilities must be available for all patients undergoing craniotomy or any procedure that might compromise the airway.
- Patients should be followed at regular intervals at least into adolescence to monitor cranial and facial growth, overall development, neurological status, ocular function, speech and hearing, and psychosocial adjustment.
- For patients with microtia, surgical reconstruction of the external ear, auditory canal, and middle ear are treatment options. Microtia reconstruction requires a staged surgical approach. Infrequently, the use of ear prostheses, which may be attached with adhesive or osseo-integrated implants, is an alternative. The choice depends upon the medical condition and patient preference. Use of the osseo-integrated implants, however, may compromise future surgical external ear reconstruction.

- In the case of surgical procedures that may alter dental occlusion, model surgery and prediction tracings should be completed in the treatment planning process.
- Orthognathic surgery (and/or distraction osteogenesis) is indicated when orthodontic treatment cannot achieve functional and/or acceptable esthetic occlusion and facial harmony. Such surgery should be timed to minimize any adverse effect on possible subsequent growth, and the timing should be determined in consultation with the team. Whenever possible, orthognathic surgery should be delayed until physical maturation is essentially completed.
- Earlier surgery may be indicated when there are serious concerns regarding a compromised airway, jaw function, speech, or psychosocial adjustment. However, the patient and family must understand that additional procedures may be required to optimize the outcome. Secondary procedures including distraction osteogenesis may be necessary to correct residual differences of the mandible, maxilla, orbits, zygoma, forehead, and nose.
- If mandibular ankylosis is present, surgical release should be carefully considered and integrated with a comprehensive plan including postoperative physical therapy. The child's ability to participate in postoperative therapy should be considered during this treatment planning. Both surgical intervention and subsequent physical therapy may be necessary to facilitate mandibular development, improve the airway, or ameliorate feeding difficulties.
- The timing of correction of Craniostenosis classically should be started at the age of 6 months to avoid restriction of the brain growth and mental retardation, but this should be correlated with the readiness of the institution as mortalities and morbidities are more in younger children. It can be delayed to one year if the institution is not prepared to deal with this young age. The more sutures affected the earlier the need for surgery.
- The timing of fronto-orbital advancement in Crouzon syndrome and allied syndromes should be considered according to the degree of exophthalmos. The severer the exophthalmos the earlier the intervention to prevent eye complications.
- Correction of orbital hypertelorism is usually started at the age of 6 years when enough thickness of bone exists however intervention at younger age is considered in case of meningocele or when fronto-orbital advancement is required to correct exophthalmos.
- Atypical facial clefts are the most challenging in craniofacial syndromes which need a lot of experience in cranioplasty and nasal reconstruction which almost needs repeated bone grafts as bone grafts do not grow with facial growth. Also affection of the orbit and eyelids needs a lot of experience in reconstruction.
- Distraction osteogenesis should be encouraged as these are more conservative with less bleeding, by keeping cranial bones attached to the dura leads to elimination of dead space and also distracts the dura which is more effective in allowing distension of the brain and enhances its growth.

Dental Care

Patients with craniofacial anomalies require multi and inter- disciplinary dental services as a direct result of the medical condition and as an integral part of the habilitative and rehabilitative process.

- Infant impressions, photographs, and imaging (3D soft tissue) should be recorded.
- A child with cleft lip and/or palate should be projected to the concerned types of pre-surgical orthopedic services available to correct soft tissue deformities and decrease cleft gaps.
- Provision of dental services for these patients includes primary care and routine dental care. Early in life, these services are best provided by a pediatric dentist familiar with the needs of this population.

- Dental care should occur within six months of the eruption of the first tooth and continue regularly throughout life.
- As the child ages, the routine dental needs may be switched over to a general dentist based on the recommendations of the pediatric dentist and team in general.
- Dental services include but are not limited to: dental examinations, caries control, preventive and restorative dentistry, and prosthetic dental treatment as needed.
- Regular, ongoing dental evaluations should also include close monitoring of periodontal disease, anomalies of the dentition, and eruption disturbances.
- Prosthetic appliances may be required in some cases. These may include but not be limited to obturator to close fistulae and teeth bearing prosthesis.

Orthodontic Services

- Patients with craniofacial anomalies require orthodontic services as a direct result of the congenital medical condition and as an integral part of the habilitation and rehabilitation process.
- Infant impressions, photographs, imaging, dental films, and cephalometric radiographs should be utilized to evaluate and monitor dental and facial growth and development.
- Regular, ongoing contact should be continued with the craniofacial orthodontist to monitor growth, position, and size of the skeletal and dental components, and dental hygiene, allowing for the determination of the optimal time for intervention.
- Active treatment is typically accomplished in a series of phases with each phase having specific objectives. These phases are typically in infancy, primary dentition, transitional dentition, and permanent dentition. Ongoing records are obtained in a serial fashion to monitor craniodentofacial growth and development, as well as the results of ongoing treatment.
- Infant impressions, photographs, imaging, dental films, and cephalometric radiographs should be utilized to evaluate and monitor dental and facial growth and development.
- For patients at risk of developing a malocclusion, or maxillary-mandibular discrepancy, diagnostic records should be collected at appropriate intervals.
- Before the primary dentition is completed, the skeletal and dental components should be evaluated to determine if a malocclusion is present or developing. Orthodontic treatment of malocclusion may be performed in the primary, mixed or permanent dentition.
- Functional orthodontic appliances may be prescribed. Orthodontic treatment may be required in conjunction with surgical correction (and/or distraction osteogenesis) for correction of the facial difference.

Genetic/Dysmorphology Services

A comprehensive clinical genetic evaluation is a key component in the management of patients with congenital craniofacial anomalies and should include but not be limited to diagnosis, recurrence risk counseling, recommendations for medical management and surveillance studies based upon genetic diagnosis, and counseling regarding prognosis. Indications for referral for a complete genetic evaluation include, but are not limited to: positive family history, prenatal growth deficiency, unexplained postnatal growth deficiency, developmental delay or intellectual disability, associated major malformations and/or disorders, associated minor malformations, family request, and recognized genetic diagnosis. Complex syndromes involving craniofacial anomalies may not fully express clinical manifestations that can be recognized in the first years of life. Thus, genetic follow- up evaluations are necessary to continue the identification of the diagnoses and to use updated genetic testing. Patients who are first seen by the team at later ages should also be evaluated by the geneticist. Prenatal ultrasound will often detect cleft lip with or without cleft palate. Isolated cleft palate is rarely identified by ultrasound. A timely referral to specialists experienced in diagnosis, management, and treatment of children with these and related conditions should be made.

Nursing Care

Complex interdisciplinary management for individuals with congenital craniofacial anomalies requires a high level of ongoing coordination of services. Nursing assessment, interventions, and ongoing follow-up evaluations are integral to the long-term care needs of the child or individual with congenital craniofacial anomalies and family. Services for the patient and family include:

- Feeding assessments, interventional teaching, and follow-up of nutritional and growth assessments.
- Serving as role models of acceptance and nurturance for the patient and family including acceptance of cultural beliefs and cultural diversities.
- Preparation of patients and families for what to expect when either in-patient or out-patient surgical procedures are scheduled.
- Information should be provided on pre- and postoperative feeding, the rationale for the use of restraints, special positioning, airway maintenance, pain management, surgical site protection and wound care, activity restriction, anticipated outcome, and the necessity for, and timing of, postoperative examinations.

Otolaryngologic Care

Comprehensive care of children with cleft and craniofacial anomalies typically requires long-term monitoring and care of the ears, nose, and throat. Otolaryngologic care of the airway, speech, swallowing, and ears must be well coordinated with surgery, speech, and audiology. Otolaryngologic care begins at birth and can extend into adulthood.

Airway

- Sequential airway assessments beginning at birth are often required to evaluate structural and functional causes of airway difficulties. Such assessments may include but are not limited to: flexible and rigid endoscopy, radiologic studies, airflow studies, CT and MRI scans, and polysomnography.
- Upper airway obstruction may be due to but not limited to: facial skeletal insufficiency, soft tissue excess, nasal and\or septal difference, choanal stenosis/atresia, and laryngotracheal differences.
- In newborns, failure to thrive and feeding problems are often airway related and may require coordination among otolaryngology, surgery, and speech-language pathology. In an older child, noisy breathing and obstructive sleep apnea may contribute to failure to thrive and/or academic difficulties.
- Airway management might include soft tissue reduction, such as tonsillectomy, reduction of turbinate, or tongue reduction. Adenoidectomy secondary to recurrent otitis media with effusion may be recommended. However, partial adenoidectomy is recommended in an effort to retain a portion of the adenoid to assist in velopharyngeal closure. Additional improvement in airway may be accomplished through nasal and septal reconstruction, addressing sinus dysfunction, and skeletal correction of deficient mandible and/or maxilla.
- When required, laryngotracheal procedures, including, but not limited to, tracheotomy or supraglottoplasty, might be indicated if the individual experiences signs of airway obstruction at the laryngeal level.

Ears and Hearing

- The ears should be evaluated on a regular basis, beginning with a physical examination of the ears in the initial months of life.
- Eustachian tube function must be evaluated on an ongoing basis to evaluate possible dysfunction in the middle ear.
- Early detection and treatment of otitis media with and without effusion is mandatory, as hearing loss can impact communication.
- Treatment of middle ear disease may include but not be limited to: systemic and or topical antibiotics, insertion and/or removal of tympanostomy tubes, tympanoplasties, removal of cholesteatomas, mastoidectomies, and ossicular reconstruction.
- Microtia and aural atresia reconstruction require close coordination between surgical and/or prosthetic treatment and aural rehabilitation.

Pediatric Care

Pediatric care provided within the context of the team is fundamental in assuring that the health needs of the child with craniofacial anomalies are identified and appropriately treated. Pediatric team care ideally begins prenatally and continues until the patient's care is successfully transitioned to adult providers. Pediatricians, nurse practitioners, and geneticists often serve as the pediatric provider on the team. The goals of the pediatric team care provider include but are not limited to:

- Identify the clinical diagnosis for the patient's health concern(s). Establishing a diagnosis may require variable combinations of laboratory, imaging, and/or consultant evaluations.
- Monitor children for growth failure, delayed development, or other significant health concerns.
- Evaluate the child's health prior to planned surgical procedures, and provide recommendations regarding readiness for both surgical and nonsurgical interventions.
- Provide the patient, family, and team members with diagnosis-specific health risk precautions, such as but not limited to: spine and airway at risk, medication risk, or potential for adrenal insufficiency.
- Monitor the patient's health status and initiate evaluation and treatment of health problems directly related to the specific craniofacial condition (e.g., cleft palate), family history (e.g., parent with thrombosis), patient symptoms (e.g., sleep- disordered breathing), and physical exam findings (e.g., murmur).

Psychological and Social Services

The accomplishment of the goals of treatment of the patient with craniofacial anomalies requires periodic assessment of the psychosocial needs of both the patient and the family. The psychosocial interviewer may come from the ranks of professionals such as those in social work, psychology, and psychiatry. Standardized assessment of neuro-developmental functioning of infants, toddlers, and preschoolers may be performed by qualified professionals. However, for school-aged children, standardized psychological tests must be administered and interpreted under the supervision of a licensed psychologist preferably a person familiar with craniofacial anomalies and related speech and hearing disorders.

- Psychosocial screening interviews should be conducted periodically to assess parental competence and nurturance, child management skills, parent-child relationships, and the emotional and behavioral adjustment of the child. This screening should begin in infancy and continue throughout young adulthood.

- Psychosocial screening should be conducted to assess the individual's emotional readiness for early surgical intervention.
- Parents and youth with craniofacial anomalies should receive guidance regarding topics to include but not be limited to: behavior management, teasing, rejection by other family members, public attitudes, fear of and expectations from surgical procedures, and emotional adaptation to treatment.
- Information about learning performance should be obtained periodically. If neurodevelopmental and/or learning disorder evaluations/intervention services are provided in the child's community, these services should be reviewed and monitored by the team on an ongoing basis.
- As they mature, individuals should be given information about their craniofacial difference and should be permitted and encouraged to become active participants in treatment planning.
- Team care should include preparation for the support and transition of the young adult to adult craniofacial care.

Speech-Language Pathology Services

Children with cleft palate and craniofacial anomalies are at risk for communication disorders. Careful assessment of speech and language skills is essential in determining management (e.g., surgical, dental, speech-language therapy), monitoring progress, and evaluating treatment outcomes. Speech-language evaluations should occur often enough to ensure appropriate documentation of each child's current communication skills, their communication progress, and to develop appropriate recommendations for intervention based on the individual's age and needs.

- Speech-language pathology services should include ongoing evaluations of language development. These evaluations should begin prior to palate repair. Speech evaluations for a child with a craniofacial anomaly should be conducted on an annual basis and/or per team request up to six years of age. Additional speech evaluations should be conducted if there are concerns of language disorder, articulation disorder, or resonance imbalance.
- If it is determined that communication skills are not at an age or developmentally appropriate level, or if early speech productions are deviant, a referral should be made to a qualified speech-language pathologist in the community. This may include an early childhood intervention program that includes speech-language pathology services.
- For individuals present with communication disorders, and for those in which the basis for continuing velopharyngeal dysfunction cannot be definitively determined, reevaluations should take place as often as deemed necessary by members of the interdisciplinary team.
- Evaluations of communication conducted as a part of a team visit should include, but not be limited to: language development, articulation development, and perceptual assessment of resonance and voice.
- If articulation is deviant and characterized by maladaptive compensatory mis-articulation errors associated with cleft palate, speech therapy may result in positive changes in velopharyngeal closure.
- Speech evaluations are necessary pre- and post- treatment to determine candidacy for, and outcomes of, surgical, behavioral, and/or prosthetic management of the velopharyngeal system.
- For patients with craniofacial anomalies who are candidates for orthognathic surgery, pre- and postoperative perceptual speech evaluations are necessary.

- Instrumental assessment of velopharyngeal function is required for all patients with resonance disorders and/or audible nasal air emission. Instrumental assessment procedures may include but not be limited to: imaging (multiview videofluoroscopy, nasopharyngoscopy), aerodynamic (pressure flow), acoustic (nasometry), and speech recordings. If a voice difference is present, a referral should be made to an otolaryngologist and a recommendation for direct laryngoscopy. This is necessary prior to initiating voice therapy.

Quality Management

The quality of care for patients with craniofacial anomalies and related disorders must be carefully monitored by the team providing diagnosis, treatment planning, and treatment services. This requires longitudinal assessments of the outcomes of treatment, periodic team review of the clinical outcome data, and team adaptation of treatment procedures when clinical outcome assessments do not reach referenced criteria. A quality management team would positively help in this objective.

Craniofacial
Orthognathic Surgery Guidelines

Introduction:

Orthognathic surgery (jaw straightening surgery) is a life-changing procedure that involves a spectrum of surgical maneuvers on the upper jaw, lower jaw and chin, to improve both form and function. Orthognathic surgery may be undertaken to correct malocclusion (abnormal dental relationships) and dentofacial deformity (skeletal discrepancies between the mandible, maxilla, and skull base causing functional and/or psycho-social problems) and/or to treat obstructive sleep apnea. Pre-surgical orthodontics is usually employed to decompensate dental relationships in anticipation of surgical repositioning of the maxilla and/or mandible to normalize dental and facial relationships.

The beneficial effects of orthognathic surgery on the quality of life have been extensively demonstrated (Cunningham et al., 2002; Motegi et al., 2003; Choi et al., 2010; Esperão et al., 2010; Murphy et al., 2011; Silvola et al., 2014; Antoun et al., 2015; Silva et al., 2016; Song & Yap, 2017; Sun et al., 2018; Gabardo et al., 2019; Saghafi et al., 2020) and systematic reviews confirm the positive quality of life outcomes (Hunt et al., 2001; Alanko et al., 2010; Soh and Narayanan, 2013; Liddle et al., 2015; Huang et al., 2019; Merger et al., 2021).

Ideal candidates for orthognathic surgery:

Candidates for orthognathic surgery have dentofacial deformities that cannot be corrected by orthodontics alone.

- Those who have a bite discrepancy including overbite, underbite, crossbite and/or openbite including patients with post-traumatic jaw deformities and malocclusions, craniofacial microsomia, & cleft lip and palate
- Those looking to improve facial disproportion / imbalances such as asymmetry, upper and/or lower jaw under-development, lower jaw excess or chin deficiencies
- Patients with obstructive sleep apnea
- Individuals with realistic goals

Dentofacial relationships and possible surgical corrections can be categorized as follows:

Malocclusion	Facial Bone Deficiency	Surgical Procedure
Class I	Normal	None (orthodontics only)
Class II, division 1	Deficient mandible	Mandibular advancement
Class II, division 1	Deficient mandible	Mandibular advancement with maxillary orthodontics
Class III	Deficient maxilla or Prognathic mandible	LeFort I advancement & or mandibular setback

In one jaw surgery the occlusal plane of the mandible or the maxilla dictates the final position as only one jaw is going to be mobilized, whereas in bimaxillary surgery the occlusal plane can be altered and the jaws can be repositioned in three dimensions. Bimaxillary surgery requires an intermediate occlusal splint to help position the first jaw.

Bimaxillary surgery is usually required for facial asymmetries, combined anterior- posterior problems involving both jaws, vertical deformities and or transverse discrepancies, eg, apertognathia, open bite (dento-alveolar, skeletal base, combination of both) and crossbites

Orthognathic surgery is not the only modality to correct bite discrepancies, facial imbalances or obstructive sleep apnea, and other less invasive procedures may be appropriate.

Planning & preparation:

Planning for orthognathic surgery requires close coordination between a qualified plastic surgeon specifically trained in the field of orthognathic surgery and a skilled orthodontist who is familiar with surgical-orthodontic cases. Other specialties could be involved in assessment & preparation depending on the aetiology of the problem. All orthognathic surgery options including surgery-first are to be thoroughly evaluated to chose the best plan that fits the individual patient needs. The patient expectations and the potential risks of the surgical procedures must be taken into consideration.

An efficient & patient-centric process ensures optimal outcomes. The key to proper planning is a precise diagnosis reached through clinical examination, cephalometry, and standardized photography. Above that 3D-imaging (CT, 3D- reformatted CT, 3D-photography, 3D-models) may be indicated for complex asymmetric cases.

1. **Clinical picture**
   - Establishing the patient's concerns and expectations.
   - Complete medical and dental history should be taken noting any pathology of the temporomandibular joint (TMJ), history of obstructive sleep apnea (OSA), cleft lip and palate, airway surgeries (e.g. pharyngeal flap) and masticatory difficulties.
   - Evaluate bite discrepencies & facial disproportion (attached sheet: Oral exam should include determination of Angle classification, alignment of maxillary and mandibular midlines, presence of occlusal cants, and assessment of global oral hygiene. Maximal incisal opening (MIO) should be noted as well as as well as any crepitus, pain, or abnormal subluxation of the TMJ with range of motion.any crepitus, pain, or abnormal subluxation of the TMJ with range of motion. (attached clinical evaluation sheet)
   - Evaluate the patient's general health status and any pre-existing health conditions or risk factors (drug allergies, previous medical treatments and specifically any problems with eyes)
   - Inquire about current prescription medications, including vitamins, herbal supplements, alcohol, tobacco and drug use
   - Inquire about previous surgeries
   - Standard digital photography (profile, frontal view, three quarter view, bird's eye view) are taken with face adjusted utilizing Frankfort horizontal line
   - Psychological assessment and assessment of impacts on daily living. Where required, referral for psychological evaluation is arranged.
   - Patients receiving treatment for OSA should have the diagnosis confirmed by appropriate sleep studies
   - Patients may be put in contact with appropriate support groups.

2. Cephalometry & CT

- Standard skeletal analysis is based on plain X-Rays taken in the sagittal and frontal plane.
- Standardized reference points, lines, and angles are taken from lateral cephalograms to characterize dentofacial relationships (attached). These measurements are then compared to normative values to characterize the degree of deformity and to plan movements of either the maxilla or mandible to restore appropriate dentofacial relationships. Normative values are based upon a patient's age, sex and ethnicity.
- Nowadays programs are developed to perform 3D cephalometry based on 3D reformatted CT scans.

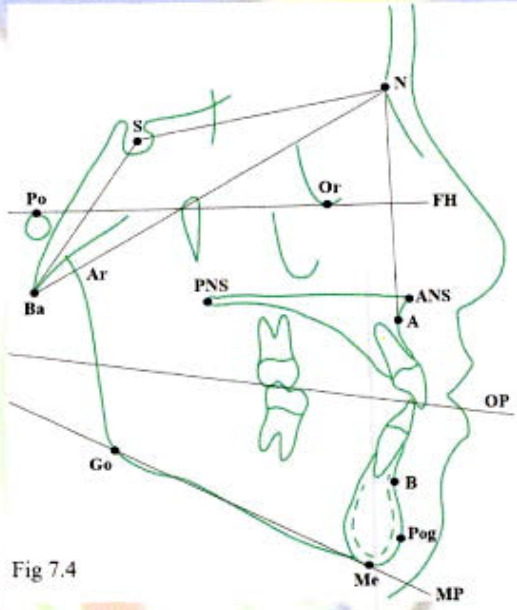


Fig 7.4

S: Sella
N: Nasion
FH: Frankfort Horizontal
Po: Porion
Or: Orbitale
Ar: Articulare
Ba: Basion
PNS: Posterior nasal spine
ANS: Anterior nasal spine
A: Point A
OP: Occlusal plane
B: Point B
Go: Gonion
Pog: Pogonion
Me: Menton
Gn: Gnathion
MP: Mandibular plane

3. Profile Prediction

- Planning is based on the clinical examination, evaluation of pictures andcephalometry.
- In order to visualize profile changes, X-Rays and pictures can be superimposed in commercially available planning software. If the bone is moved the soft tissues will follow (not in a 1:1 ratio) and a virtual image ofthe surgical result is created. The virtual images may be used to discuss treatment outcomes and alternatives with the patient.

4. Model Analysis

- Dental impressions are taken to create plaster casts of the maxillary and mandibular dental arch forms.
- A wax bite registry is also obtained to orient the plaster casts into thepreoperative occlusion.
- The dental casts are then mounted into semi adjustable articulator after facebow transfer to recapitulate the appropriate preoperative occlusion.
- The actual centric occlusion of the patient is recorded.
- The models allow to analyze the:
  - Occlusion
  - Shape of the dental arches
  - Position
  - Size and shape of the teeth
  - Position of the jaws in relation to the skull base
- The plastic surgeon & the orthodontist discuss orthognathic surgeryoptions & chose best that fits the individual patient needs
- Preoperative orthodontics is then carried out to "decompensate" the patient's preoperative occlusion in anticipation for the surgical movements of the jaw that will ultimately move the patient into an ideal postoperative occlusion.

5. Mock surgery & fabrication of splints

- "Mock or Model surgery" is then performed on the dental casts to mimic the planned surgical procedure. It is also a powerful tool to demonstrate the treatment plan to the patient.
- All movements should be visible in a three dimensional fashion whileusing reference lines scribed on the models before performing the movements.
- Once repositioned, the dental casts are then secured in their new position using wax or glue
- An acrylic occlusal splint is created to intraoperatively position a mobile osteotomized jaw against the other stable jaw before an internal fixation procedure is performed. In case of two-jaw surgery two splints need to be fabricated. The first one is used after osteotomy of the first jaw as an intermediate splint, the other one after the second jaw has been osteotomized as a final splint. Usually the two splints are colour coded to avoid confusion.
- Mock surgery can also be performed using individual stereolithographic models. This is indicated for severe and mostly asymmetric deformities.

6. 3D virtual planning

- Advances in technology have led to the rise of virtual surgical planning (VSP)for orthognathic surgery whereby the same "model surgery" is digitally performed with high resolution 3D reformatted maxillofacial CT scans of the patient. Based on the "virtual" movements of the maxilla and or mandible, occlusal splints are created from the 3D reformatted CT scan images and later printed using CAD-CAM technology to guide maxillary and mandibular movements intraoperatively.

Orthognathic treatment

Usually involves three essential stages:

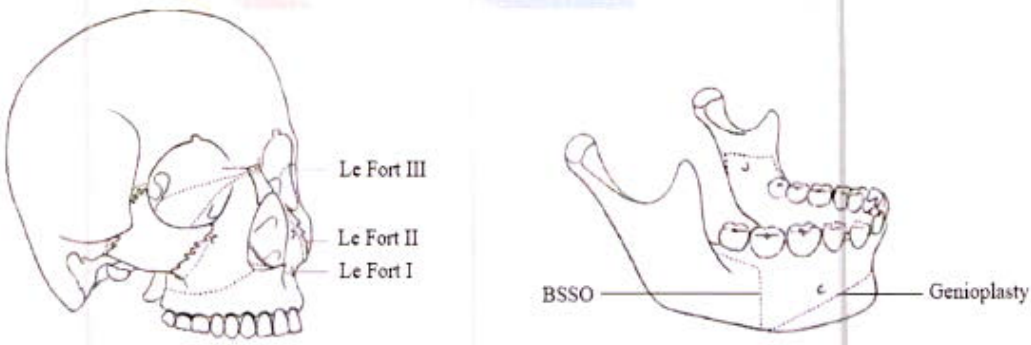
1. Pre-surgical preparation

This predominantly involves the orthodontic preparation of patients for surgery by correcting abnormal tooth positions which occur as a result of the underlying jaw deformity. This process generally takes 18-24 months, with regular orthodontic appointments every four to six weeks. This stage may also involve preparatory surgery, including dental extractions or procedures such as surgically assisted palatal expansion. Alternatively, surgery-first could be carried out when appropriately indicated with shortening or eliminating the period of orthodontic treatment.

2. Surgical Procedure:

This is carried out on an inpatient basis under general anaesthesia. A typical length of stay is around two nights. The type of maxillary and/or mandibular osteotomies that are required are determined by the preoperative examination and cephalometric analysis. "One jaw" (maxilla or mandible repositioning only) vs "double jaw" surgery (maxilla and mandible repositioning) may be required depending on the degree of preoperative dentofacial deformity and dentofacial relationships. Orthognathic surgery typically includes the following osteotomy patterns: (attached)

Le Fort I Horizontal maxillary cut above the apices of the maxillary teeth
Le Fort II Nasomaxillary cut
Le Fort III Craniofacial separation
Bilateral sagittal split osteotomy (BSSO)
Vertical oblique genioplasty



Once osteotomies have been performed, the mobilized maxilla and mandibular segments can be advanced forward, set back (moved posteriorly), impacted (moved superiorly), down grafted (moved inferiorly), rotated, or asymmetrically angled as indicated by the patient's preoperative surgical plan.

In certain syndromic craniofacial deformities (e.g., Crouzon's or Apert's syndrome), the upper jaw deformity also includes a more generalized midface hypoplasia which includes the orbit and nose as well. This often necessitates a more extensive Le Fort osteotomy (types II and III) that require more can result in craniofacial dysjunction in order to change the relationship of the midface to the skull base. Advancements of maxillary or mandibular segments greater than 10mm are likely to be unstable and either require immediate bone grafting or must be combined with distraction techniques to overcome soft tissue recoil and prevent relapse of the original deformity.

The pre-fabricated occlusal splints are used to guide final positioning of the maxilla and/or mandible and rigid fixation is achieved typically with plate and screw systems. Maxillomandibular fixation (MMF) or wiring of the upper and lower jaws may be indicated for large, potentially unstable movements. Postoperatively patients may also be placed in "guiding elastics" to help guide the teeth into the proper postoperative occlusion.

3. Post-surgery

Postoperative recovery time is typically two weeks following a single jaw procedure and three weeks following a bimaxillary (upper and lower jaw) procedure. Post-surgical intensive care is rarely required.
Intensive regular follow-up is essential in the early post-operative period. A period of post-surgical orthodontics is then required on a six weekly basis for up to twelve months to idealize the final occlusion.
The gold standard for follow-up involves reviews following removal of orthodontic appliances on yearly basis for at least two years with standard records taken at those appointments.

Risks of orthognathic surgery

The decision to undergo orthognathic surgery is extremely personal and the patient is to weigh the potential benefits in achieving the goals with the risks and potential complications. Only the patient can take that decision & will be asked to sign consent forms to ensure they have understood the procedure and any risks and potential complications.

Serious complications are a relatively rare occurrence in orthognathic treatment. It is a procedure with generally low morbidity, which means the risk:benefit ratio is favourable for most patients. However, possible orthognathic surgery risks should be fully discussed prior to consent and include:

- Anesthesia risks
- Bleeding
- Damage to teeth
- Improper healing of the bones
- Infection
- Jaw joint problems
- Limitation in mouth opening
- Numbness to the cheeks and lower lip, that can, on occasion, be permanent
- Possible need for revision surgery
- Relapse or recurrence of the original bite problem
- Swelling and bruising
- Unfavorable scarring
- Ophthalmic injuries could occur through indirect injuries to neurovascular structures occurring from traction, compression, or contrecoup injuries from forces transmitted during the pterygomaxillary dysjunction using an osteotome or from fractures extending to the base of the skull or orbit associated with the pterygomaxillary dysjunction or the maxillary downfracture.

Quality assurance checklist

Preoperative		
	Orthognathic treatment is usually carried out following cessation of growth	
	Appropriate planning following above guidelines to choose the best plan that fits the individual patient needs	
	Patients are given all appropriate information in a variety of media and given adequate time to assimilate this information and discuss prior to reaching a final decision as to whether or not to proceed with treatment	
	Standard digital photography (profile, frontal view, three quarter view, bird's eye view) are taken	
	Preoperative orthodontics	
	Extract 3rd molars at least 6 weeks before mandibular setback	
	Fabricate dental/occlusal splints (intermediate & final that are colour coded)	
	Arch bar application	
	Oral hygiene	
Intraoperative		
	Surgery conducted by appropriately trained and experienced surgeons in a specialized facility	
	Final check of dental/occlusal splint(s) prior to intubation	
	Patient reminded that they might wake up with mouth shut if IMF is to be applied	
	Check specialized surgical instruments	
	Nasal intubation making sure it's centralised upwards	
	Secure nasal tube through nasal septum & scalp	
	Ensure insertion of oral pack	
	Patient positioned in the supine position with the head elevated (reverse Trendelenburg position) to ensure adequate venous drainage and decreases bleeding.	
	Adequate illumination with a bright headlight greatly facilitate the procedure	
	Prepping of whole face & neck	
	Measure midface length (medial canthus - edge of upper lateral Incisor)	
	Intraoral incisions	
	Execute planned osteotomies avoiding injury of vital structures with special caution in cases with congenital anomalies	
	Mobilize bones into the planned positions	
	Fixation with plates and screws	
	In case of double jaw surgery, the maxilla is usually repositioned first using Le Fort I osteotomy and an intermediate splint. Internal fixation is then applied	

	Then the MMF and the intermediate splint are removed followed by mandibular osteotomy & internal fixation of the mandible is performed while the patient in MMF with the occlusion secured through the final splint.	
	Remove MMF & re-check occlusion & mouth opening	
	Ensure removal of oral pack	
	Re-apply dental elastics or MMF if indicated	
Postoperative		
	Postoperative psitioning to avoid aspiration	
	Be ready with wire cutter if MMF was maintained postoperatively	
	Head elevation	
	Meticulous oral hygiene	
	Depending upon the stability of the internal fixation, the diet can vary between liquid and semi-liquid to "as tolerated", at the discretion of the surgeon.	
	If dental elastics are used postoperatively, patients should be shown how to place and remove the elastics using a hand mirror.	
	Postoperative x-rays are taken within the first days after Surgery	
	The patient is examined approximately 1 week postoperatively and periodically thereafter to assess the stability of the occlusion and to check for infection of the surgical wound	
	During each visit, the surgeon must evaluate the patients ability to perform adequate oral hygiene and wound care	
	If a malocclusion is detected, the surgeon must ascertain its etiology (with appropriate imaging technique). If the malocclusion is secondary to surgical edema or muscle splinting, training elastics may be beneficial. If malocclusion is secondary to a bony or fixation problem, the patient must return to the operating room for revision surgery.	
	Postoperative orthodontics as planned	

Instructions for patients

Preoperative	
	The patient consents that they understand the nature & purpose of this procedure to correct the skeletal component of the malocclusion and the dentofacial deformity, and that they have been involved in all preparatory Steps
	The patient consents that they understand the all possible risks involved in this procedure
	No facial procedures such as laser hair removal, waxing, lesion removal, etc.., nor dental surgery is allowed prior to jaw surgery
	All medications that are taken have to be reported as some can interfere with anesthesia or cause undesirable side effects that affects the surgical procedure
	Taking aspirin, anti-inflammatory drugs and herbal supplements has to be avoided as they can increase bleeding and bruising
	Women patients surgerires are to be scheduled away from their menstrual Cycle
	Patient reminded that when they wake up teeth might be placed in MMF
Postoperative	
	Following post-operative instructions is essential to the success of surgery
	During jaw surgery recovery, swelling of the face is the most significant finding. The face will continue to swell after the first 24 hours & reaches its peak at 48 to 72 hours. Subtle residual facial swelling may last for several weeks
	Applying crushed Ice bags to the eyes during the day for the first 48 hours will decrease the amount of swelling
	Head is to be rested on at least two pillows to keep swelling to a minimum
	An elastic bandage or compression garment might be used to minimize swelling and support the jaws as it heals following surgery
	Initial healing may include some bruising and discomfort that can be controlled with pain medication.
	All medications should be taken as prescribed to aid healing and reduce the risk of infection
	Bloody oral & nasal discharge is expected for a few days after surgery & the drip pad can be changed as often as needed
	Diet can vary between liquid and semi-liquid to "as tolerated" depending upon the complexity of bony movements & stability of the internal fixation
	Patients with intraoral wounds must be instructed in appropriate oral hygiene procedures. Chlorhexidine oral rinses should be prescribed and used at least three times each day to help sanitize the mouth
	For larger debris, a 1:1 mixture of hydrogen peroxide/chlorhexidine can be used. The bubbling action of the hydrogen peroxide helps remove debris.
	A Waterpik® is a very useful tool to help remove debris from the wires. If a Waterpik is used, care should be taken not to direct the jet stream directly over intraoral incisions as this may lead to wound dehiscence
	A soft toothbrush (dipping in warm water makes it softer) should be used to clean the surfaces of the teeth and arch-bars
	It is important that the surgical incisions are not subjected to excessive force, abrasion or motion during the time of healing
	Physiotherapy, opening and excursive exercises are begun as soon as possible. Goals should be set, and, typically, 40 mm of maximum interincisal jaw opening should be attained by 4 weeks postoperatively
	The patient should rest at home for 2 days following discharge. Ambulate to the bathroom only with help. Resume normal activity after 2-3 days
	Showers may be started after the 3rd day following discharge

Orthognathic clinical evaluation sheet

Personal information:

Name: .....
Age: .....
Gender: .....
Address: .....
Telephone #: .....

History:

- Complaint: - Facial aesthetic
- Functional problem: * Difficulty in eating
  * Difficulty with speech
  * Problem with bite
  * Problem with TMJ = pain
  = limited mouth opening
  = clicking

Chief concern of patient:
Patient's motivation:
Medical & dental history

General examination

Facial examination

I- **frontal:**
1. vertical facial balance
2. Transverse facial symmetry
3. The eye
4. The nose
5. The mouth
6. The chin

II- **Profile:**
1. Vertical proportions
2. Sagittal projection Frontal bone Maxilla Labiomental angle chin, throat neck angle.

Intraoral examination

1. Periodontal disease
2. Dentition
3. Occlusal relationship

Occlusion / Malocclusion: Class I	Class II	Class III
Crowding	Spacing	
Overbite	Overjet	
Open bite	Cross bite	

4. Functional analysis
   - TMJ
   - Muscles of mastication
   - Lateral excursions
   - Protrusive excursions
   - Deviation during opening
   - Interincisal measurement during maximum mouth opening

Cephalometric Analysis Form

Name: .....

Age: .....

	Mean	Initial	Postortho.	Postop.
Maxillary position				
SNA	81.2°			
A to N ⊥	1.1mm			
Sn to G vert.	6mm			
Mandibular position				
SNB	77.3°			
SN-GoGn	33.5			
Pg to N ⊥	-4.3mm			
Pg to G vert.	0.0mm			
Intermaxillary relations				
ANB	3.9°			
Wits Appraisal	-1.1mm			
Harvold Unit Diff.	27.0mm			
Maxillary dentoalveolar				
U1-NA	22.0°			
Mandibular Dentoalveolar				
L1-NB	26.1°			
Vertical dimensions				
UFH	71.3mm			
LFH	75mm			
FH ratio	96mm			
Ramus height	44mm			

Guidelines
For Surgical Management of Maxillofacial Tumors
Plastic & Maxillofacial Surgeons Perspective

Introduction:

Maxillofacial tumors include all benign, pre-malignant and malignant ulcers, cysts or swellings affecting skin, adnexa, mucosal lining or bony skeleton or any layer of the facial region extending from the forehead to the neck including the relevant draining lymph nodes.

Maxillofacial tumors are associated with high mortality and morbidity, so early detection & multidisciplinary discussion is needed. Proper treatment planning of the tumor, affected lymph nodes and associated second primary malignancies, if present, has an important impact on prognosis.

Management of tumors of this region is shared by the plastic and maxillofacial surgeons, general surgeons, ENT surgeons, dental surgeons, ophthalmologist and neurosurgeons.

Scope of these guidelines:

These are general guidelines regarding any cystic or solid, benign or malignant, intra oral Soft tissue or bony ulcers or swellings and bony tumors of the facial skeleton.

Common presentations of maxillofacial tumors:

- Mental numbness
- Pain
- Discharge
- Ulcer / swelling
- Bad odor / taste
- Loosening of teeth
- Bleeding from gum or oral cavity

Examination

- Oral cavity
- Cheeks
- Tongue
- Dentition
- Palate
- Floor of mouth (FOM)
- Mandible
- Facial bony skeleton
- External skin
- LN
- Body for metastases or second primary malignancies (SPM)

Metastasis (early to)

- Head and neck
- Lung
- Esophagus

Assessment of:

- Airway
- Range of mouse opening
- Oral functions:
  - Mastication
  - Speech
  - Swallowing
- Tongue strength
- Salivary production
- Acoustic measurement

Pre malignant lesions

- Erythroplakia
- Leukoplakia
- Lichen planus
- Oral submucous fibrosis
- Discoid lupus erythematosus
- Actinic keratosis

Investigation

Radiology: The patient with oral cancer is carefully examined to detect

- Bone involvement
- Soft tissue involvement
- Neck – LN
- Second primary malignancies (SPM)
- H&N Metastases
- Distant Metastases
- Lung
- Recurrence

- There is nothing as the most reliable imaging modality for the identification of mandibular involvement in oral cancer.
- MRI, panoramic X-ray, PET-CT, and cone beam CT have high accuracy in detecting mandibular invasion
- plain X-ray, CT, MRI, bone scans, single photon emission CT, and PET/CT have varying degrees of sensitivity and specificity CT and MRI are the recommended modalities for the staging of oral cancer.

Bone involvement

- CT generally showed high accuracy for detecting bony involvement.
- Cone beam CT showed high accuracy (95.7%) in detecting mandible invasion.
- Contrast-enhanced CT is recommended for the staging, pretreatment evaluation, primary tumor extent, cervical lymph node metastasis and bone involvement with short scan times.
- CT has shown high accuracy for detecting cortical erosion of the mandible in oral cancer.

Soft tissue involvement

- MRI is regarded as more suitable for assessing primary tumor and soft tissue details, compared to conventional CT.
- MRI has high sensitivity and specificity in assessing soft tissue involvement and bone invasion as well as in detecting lymph node metastasis
- MRI is more appropriate for accurate T-staging in cases with metal artifacts
- MRI thickness tended to agree strongly with histologic thickness

Neck – LN

- Contrast enhanced CT showed similar efficacy in detecting metastatic lymph nodes compared to MRI

Lung

- Chest CT is superior to bronchoscopy and chest X-ray for the detection of lung metastases

Distant Metastases / Second primary malignancies (SPM)

- PET/CT is recommended for detection of regional/distant metastases and second primary cancers.
- PET/CT showed higher specificity than did MRI but lower sensitivity.
- It is useful to rule out mandibular marrow invasion.
- Limitation of PET/CT for detection of small or superficial mucosal cancers.
- 18F-FDG PET/CT is a useful tool for staging & restaging head & neck cancers & can simultaneously detect regional recurrence, distant metastases, and possible second primary tumors with high sensitivity & specificity.

Pan endoscopy: (for SPM surveillance).

- Laryngo-pharyngoscopy
- Trachea-bronchoscopy
- Esophagoscopy

Biopsy

- All oral lesions should be considered for histologic examination
- Clinical impression is not an acceptable alternative to definitive biopsy
- Oral cytology and saliva analysis

Classification

American Joint Committee on Cancer (AJCC) 8th edition
Depth of invasion (DOI) distance from the basement membrane of the surrounding normal tissue to the deepest part

- T1 <5 mm,
- T2 >5 mm
- T3 >10 mm

- Gingival cancer tends to invade bone early, so it should be classified as T4
- It is difficult to evaluate DOI intra operatively
- Tumor thickness should be assessed by
    - Palpation,
    - Preoperative imaging
    - Intraoperative US

Differential Diagnosis:

- Consider and exclude all similar pathologies regarding clinical picture, radiological or histopathological findings

Management:

Medical

- Preoperative oral hygiene
- Measures to decrease intra operative bleeding

Dental

- Dental hygiene
- Exclusion of other lesions or concomitant pathology
- Preparing dental casts, wafer & obturator
- Root canal treatment of nearby teeth not included in the excision if necessary

Surgical management

Aim

To achieve adequate clear surgical margins and Neck clearance for long-term survival

Indications

- All premalignant or malignant conditions
- Advancing benign conditions resulting in teeth loss, cosmetic disfigurement, speech or functional problems
- Tumors endangering airway or swallowing

Contraindications / inoperable cases

- Very bad general condition
- Untreatable bleeding tendency
- Advanced tumor with deep inaccessible infiltration
- Adherence to cerebral or major vessels
- Widely spread metastasis
- Inability to reconstruct

Procedure selection

According to the specific type of tumor and its behavior regarding recurrence and 5-year survival

- Aspiration
- Curettage
- Marsubialization
- Enoculation
- Excision
  - Marginal excision
  - Segmental excision
  - Total excision
  - Radical excision
- LN dissection
- Management of SPM

Reconstruction

- Intra-oral lining
- Teeth
- Bone
- Skin
- Composite

Safety margin

- According to the specific type of tumor and its behavior regarding edge definition, mode of spread and recurrence
- Generally, 1cm safety margin in all direction is considered satisfactory
- Frozen section examination

Where to do the surgery?

- Hospital requirement
- Certified hospital with
- well-equipped operating theater for major surgeries
- ICU
- Blood bank
- Availability of needed other specialties

Who can do the surgery?

- Surgeon requirement:
  - Certified specialist or consultant (holding MS or MD) with accredited training in maxillofacial surgery
  - Capable to:
    - Differentiate between different types of tumors, their gross appearance & DD
    - Select an alternative surgical approach if needed during surgery
    - Do LN and neck dissection
    - Manage extensive and intractable bleeding
    - Do at least 2 different methods of reconstruction for bone, skin & intra-oral lining

- **Assistance**
  - Qualified one or two assistants according to magnitude of surgery
  - Reconstructive team
  - Availability of needed specialties
- **Anesthesia**
  - Qualified anesthesiologist
  - Cable to do sub-mental intubation if needed

Preoperative preparations:

- **Consultations Team:**
  - Dentist
  - Orthognathic surgeon
  - ENT
  - Ophthalmology
  - Neurosurgeon
  - Medical Oncology
  - Anesthesiologist
- **Operative planning**
  - Excision method and extent
  - LN management
  - Reconstructive options
  - Dental Casts
  - Printed 3D Models
  - CAD / CAM
  - Virtual surgical planning / Mock surgery

  Oral conditions as dentition and size and mobility of the tongue should be considered while selecting the surgical method
- **Patient preparation:**
  - Full re-examination
  - Recent investigation
  - Manage co-morbidities
  - Discussion of the problem regarding:
    - Pathology
    - Approach
    - Excision
    - LN
    - Reconstruction
    - Follow up
- **Precautions:**
  - Stop anti-coagulation
  - Control BP
  - Recent CBC & Bleeding profile

- Informed consent (Attached Sheet)
- Documentation
- Photography

- **Instrumentation & surgical equipment:**
  - Diathermy
  - Powerful suction
  - Power drill
  - Surgical Loupe
  - Operative microscope

- **Be ready with**
  - Cross-matched blood for transfusion if needed (at least 2 units)
  - Tracheostomy set & personnel
  - Frozen section examination of margins
  - Bone wax & Hemostatic agents
  - 3-D models
  - Impression molds
  - Reconstruction plan & personnel
  - Wires, plates & screws of adequate size and quantity

Surgical approach:

Marking

Incision:

- Trans-oral approach is recommended for small, anteriorly located, and easily accessible tumors to the oral tongue, FOM, gum, cheek mucosa, and the hard palate
- For advanced oral cancers, lip-splitting & sulcus incision provide excellent exposure to the oral cavity
- The upper cheek flap approach is optimal for the resection of larger tumors of the hard palate and the upper alveolus, particularly if located posteriorly
- The lower cheek flap approach requires a midline lip-splitting incision which is continued laterally into the neck, for exposure and neck dissection

Maxillary approach & incisions:

- Sublabial incision
- Trans palatal approach
- Weber Ferguson incision & its modifications
- Mid-face Degloving

Mandibulotomy:

- Excellent surgical approach for access to large posteriorly located lesions of the oral cavity.
- Paramedian mandibulotomy maintains swallowing function as it preserves the geniohyoid and genioglossus muscles, and the anterior belly of the digastric muscle.

Mandibulotomy complications

- Exposure of metal fixation plate
- Fistula formation, fixation failure
- Osteonecrosis after radiation treatment
- Unsatisfying appearance
- Disturbances of oral functions
- TMJ problems

Forehead and upper face

- Coronal flap

Tumor excision

- Small lesions without bone invasion are rare, but can be treated with only mucosal or periosteal resection
- Cystic swelling must be aspirated first
- Hard palate cancer tends to invade the bone later than does gingival cancer.
- Surgery of hard palate cancer frequently does not include removal of the underlying bone
- Enucleation is avoided for hard palate cancer because it is associated with a high risk of recurrence

Maxillectomy

- Partial maxillary (depending on tumor extension):
    - Alveolectomy
    - Palatectomy
    - Infrastructure maxillectomy,
    - Subtotal maxillectomy to preserve orbital floor
- Total maxillectomy

Mandibulectomy

- Mandibulectomy can be waived if the tumor abuts the periosteum of the mandible
- Marginal mandibulectomy
    - For oral cancers adherent to or superficially invading the cortex
    - Keep at least 1 cm of bone at the inferior border of the mandible to reduce the risk of fracture in
    - Reinforce the remaining mandible with reconstruction plates if the height of nonviolent bones is less than 10 mm
    - Marginal resection in the edentulous or in a previously irradiated mandible carry the risk of bony fracture due to osteoradionecrosis
- **Segmental mandibulectomy**
    - in extensive medullary invasion
    - If the inferior alveolar nerve canal is involved, segmental mandibulectomy extends beyond the mandibular and mental foramen
- Trismus-releasing procedures including coronoidectomy and myotomy of the masticator muscles may be considered simultaneously for patients undergoing mandibulectomy

Safety margin

- The macroscopic and palpable margin should be at least 10 mm in all planes from the edge of the tumor or palpable oral tongue cancer
- Formalin fixation and slide preparation reduced mucous margin by approximately 30%–50%. This results in a final pathological margin of approximately 5 mm for tumors with surgeon-measured margins of 1 cm
- Histopathologically, a margin greater than 5 mm is designated as a "clear margin." A margin less than 5 mm is considered to be a "closed margin," and that less than 1 mm is defined as an "involved margin"
- Oral tongue is mainly composed of muscle tissue and there is no anatomic boundary to prevent the tumor spread, oral tongue tumors spread more easily than do tumors at other oral cavity
- Thus, it is difficult to accurately evaluate the extent of tumor thickness before surgery
- The most challenging area to obtain adequate safety margins during surgical resection of oral tongue cancer is the basal area of the tongue
- Buccal cancer within the sub mucosal layer, sufficient deep resection margins should be achieved by composite resection including the buccinators
- If the tumor invades the buccinator muscles, ideally, surgical resection may be extended to the fat pads of the buccal space
- If the tumor penetrates or involves to the skin, resection of 1 to 2 cm of normal skin around the tumor is required
- Retro molar trigone cancer frequently invades to the mandible and is underestimated. Careful preoperative evaluation should be made regarding adjacent bone invasion, because of the limited space between the mucosa and the mandible
- sublingual glands and/or submandibular ducts may be sacrificed when they are included in the deep resection margins
- Sublingual glands may also be removed with metastasized sublingual lymph node

Lymph nodes:

Elective node dissection END:

- Eliminating the metastatic lymph node is one of the most important procedures in oral cancer patients
- Metastasis to the lymph node occurs in about half of the oral cancer patients at the initial stage of diagnosis
- Prophylactic ND was needed in all the cases except superficial cancer cases
- DOI can be used as a predictive parameter of neck metastasis for ND of oral cancer
- 26% occult lymph node metastasis rate was reported in patients with a tumor thickness of 2 mm or more
- Perivascular lymph node dissection should be included in END in oral cancer

Therapeutic node dissection:

- Treatment of metastatic lymph nodes should be performed according to the involved level of clinically positive neck nodes
- cervical lymph node metastasis occurs in a predictive pattern
- Ipsi-lateral levels I, II, and III are the most frequently involved sites in advanced oral cancers.
- The extent of ND should include at least level I, II, and III
- Levels IV & V are rarely involved in oral cancers except in advanced T stage or multiple clinically positive nodes, and extra capsular spread
- Radical or modified radical ND should be considered according to the status of lymph nodes metastasis
- Selective ND is not recommended

Contralateral LN:

- Oral cancers (especially those away from midline) are associated with a low incidence of contralateral metastases
- **Elective contralateral** ND is not routinely recommended

Reconstruction

Soft tissue reconstruction

- Flap reconstruction is usually required if more than 50% of the tongue is resected to preserve adequate speech and swallowing in patients with considerable defects after oral cancer surgery as in subtotal or total glossectomy
- flap reconstruction preserve mouth-opening ability and for structural cosmesis in considerable buccal defects
- flap reconstruction prevent communication between neck and oral cavity to prevent blood vessel rupture due to salivary contamination and to preserve mobility of the tongue in floor of mouth defects
- The radial forearm and the anterolateral thigh free flaps are the preferred reconstructive methods for oral soft tissue defects

Bony reconstruction

- Mandibular reconstruction helped patients regain this function
- The vascularized osteocutaneous free flap, especially the fibular free flap, is regarded as the
- primary method of mandibular reconstruction
- Mandibular reconstruction using computer-aided design (CAD) and manufacturing (CAM) can be considered for reducing trial and error and surgical time
- Bridging plates is to be combined with bone grafts
- Anterolateral defects and preoperative radiotherapy are risk factors for plate survival
- Distraction osteogenesis and segment transfere in medium sizes mandibular defects
- Mandibular reconstruction with prosthetic intervention

General recommendations:

- Water-tight sutures for mucosa
- Avoid dead space
- Apply suction drains
- Apply pressure garment if needed (not on flaps)

- 2nd primary

- To be managed according to pre-operative finding depending on site, size and nature of the malignancy

- Post-operative

- Warm ambient temperature
- Semi-sitting position
- Close follow up of the air way
- Availability of bed-side suction
- Analgesia
- Antibiotic
- Anti-inflammatory / steroids
- Fluid diet
- Mouth wash
- CBC follow up and blood transfusion if needed
- Tracheostomy care
- Flap care
- Suction removal

- Complication:

- Bleeding
- Seroma
- Infection
- Incomplete excision
- Oro-antral or external fistulas
- Hard-ware exposure
- Failed reconstruction
- Recurrence

- Chemotherapy

- Radiotherapy

- Prosthesis

- Patient education program

- Rehabilitation

- Follow up

- Patients should be regularly examined for at least 5 years after treatment for the risk of loco-regional recurrence
  - Every 1 to 3 months during year 1
  - Every 2 to 6 months during year 2
- Repeating pretreatment baseline imaging studies (CT or MRI) at least 3-6 months after treatment specially in patients receiving radiation therapy (CT, MRI, and US could not specifically differentiate postradiation edema from recurrence)
- PET-CT for the detection of distant metastasis, recurrence, and second primary tumors
- Patients treated with definitive chemo-radiation therapy should be evaluated with PET-CT at 3 months after the completion of therapy;
- Chest radiography or CT study is recommended for the detection of lung metastasis and second primary tumors in the lung
- The primary and neck disease should be assessed to evaluate treatment response and to plan salvage neck surgery if required

- Incomplete excision

- Margins of <5 mm are associated with significantly higher local recurrence
- If microscopic residual tumor or a close margin is identified, re-resection, prophylactic cervical lymphadenectomy or adjuvant treatment should be considered

- Recurrence

- Salvage surgery should be considered for recurrent oral cavity cancer if resection is feasible
- ND should be considered

- To be amended by recommendations regarding Separate recommendations for each subsite:

- Maxillary gingiva
- Hard palate
- Mandibular gingiva
- Buccal mucosa
- Oral tongue
- FOM
- Retromolar trigone (RMT)

Specific types of tumors...

Informed Consent for Surgical Excision of Maxillofacial Tumors Plastic & Maxillofacial Surgeons Perspective

Patient must explained clearly & is consented for:

- Pre, intra & post-operative photography
- Part removed
- Histopathological examination
- Possibility of incomplete excision or
- Additional excisions
    - Eye excentration
    - Partial or total glossectomy
    - LN dissection
- IMF
- Reconstructive options and advantages & disadvantages of each
- Need for further operations
- Subsequent radio or chemotherapy
- Importance of regular Follow up
- Regular body scanning
- Chances for recurrence

Intra-operative possibility of:

- Blood transfusion
- Tracheostomy
- Gastrostomy
- Need for intra operative other consultations and managing accordingly

Possibility of change of preoperative planning and:

- No reconstruction
- Inability to reconstruct
- Staged reconstruction
- Use of Plate & Screws
- Bone graft
- Skin grafts
- Local flap
- Free flap
- Fat injection

Post-operative Complications

- Bleeding
- Seroma
- Hematoma
- Infection
- Disruption
- Mal/non- union
- Complications of plates ...
- Flap loss
- Multiple operations
- Permanent tracheostomy
- Permanent gastrostomy
- Inability to talk
- Loss of function
- Disfigurement
  - Operative site
  - Donor site
- Wear a Prosthesis permanently

Egyptian Guidelines for Management of Maxillofacial Trauma

I. Emergency Management:

A. Primary Survey:

1) Airway and C-Spine:

a) Look for foreign bodies such as dentures or loose teeth through direct visualization & suction of the oropharynx.

b) With Oronasal bleeding, sitting the conscious patient up help to clear the airway & ensure airway patency.

a) A talking patient does not mean their airway is not at risk so, regular reassessment is mandatory.

b) If mandible is bilaterally fractured or comminuted, the tongue may fall posteriorly blocking the airway so, provide anterior traction (chin lift) on the floating segment to open the airway.

c) If the airway is not secured quickly using basic measures, Endotracheal intubation is the gold standard in early emergency airway protection.

d) As Traumatic displacement of tissue, oedema and bleeding can hinder intubation; A difficult intubation trolley containing several emergency airway devices such as a bougie, McCoy blade, retrograde intubation kit and video assisted laryngoscope should be on hand.

e) If endotracheal intubation is not possible, a surgical airway should be considered. A Cricothyroidotomy is now the preferred method of establishing an emergency surgical airway. Tracheostomy is generally not recommended in emergency situations due to the complexity of the procedure and the time to perform it safely.

f) A combination of alcohol, medications, brain injury and ingested blood commonly induces emesis and can compromise the airway.so, suction with endotracheal intubation should be performed.

g) spinal injuries must be considered to present until clinically or radiologically excluded. Applying a semi-rigid "Laerdal Stifneck" cervical collar allows temporary immobilization of the cervical spine.

h) in mandibular fractures, it is better to apply a headbox with straps that allows greater access to the jaw and anterior neck.

i) If a collar is to be removed, inline stabilization should be performed (log rolling).

Indications of definitive airway in maxillofacial injury
Absent spontaneous breathing
Comatose patient (glasgow coma scale <9)
Airway injury or obstruction
Persistent oxygen saturation <90%
High-risk for aspiration
Systemic shock (systolic blood pressure <80)
"Cannot ventilate cannot intubate" situations

2) **Bleeding:**

- Although Maxillofacial hemorrhage is rarely life threatening, it requires prompt intervention & look for other causes of blood loss and shock.
- External bleeding:
  - Usually controlled with direct pressure, sutures, or staples.
- Internal hemorrhage:
  - Commonly controlled by packing of the oral or nasal cavities, balloon tamponade and temporary reduction of the fracture e.g., by Maxilla-Mandibular fixation.
  - If failed, Transcatheter Arterial Embolization (TAE) is a relatively safe alternative.
  - In life threatening hemorrhages surgical ligation of the external carotid.

3) **Circulation**:

a) 2 large bores intravenous cannulation.
b) Administration of intravenous fluids till blood products be ready.

B. Secondary Survey:

- With neck immobilized, gently examine the skull and fracture site.
- Full examination of the head, eyes, ears, nose, throat, and neck (It does not replace examinations performed by specialists (i.e., ophthalmologist, neurosurgeons, etc.).

1. Eye:

- Ocular injuries are commonly missed or misdiagnosed in the trauma setting.
  - Assess obvious trauma such as corneal or conjunctival abrasion or laceration, foreign body or hyphaema.
  - Examine pupils for relative size, shape, and reactivity.
  - Assess the visual acuity of each eye: a simple bedside test (count fingers, hand, Perception of light).
  - Visual field.
  - Globe position.
  - pupillary light reflexes.
  - eye movements:
  - Retrobulbar hemorrhage:
    - Is a potentially reversible cause of proptosis.
    - Clinical signs include proptosis, diffuse subconjunctival hemorrhage with posterior extension and elevated intraocular pressure.
    - CT of the orbits should be conducted to differentiate retrobulbar hemorrhage from other causes of proptosis such as oedema, tissue herniation or orbital emphysema.
    - If progressive, is a surgical emergency and requires immediate decompression (lateral canthotomy and cantholysis) as it can result in irreversible ischemia in less than 2 hours.
  - In pediatrics, "white-eye" blowout fractures of the orbit should be excluded. These fractures can entrap orbital tissue including the orbital fat and the inferior and medial rectus muscles causing diplopia, enophthalmos, hypoglobus, subconjunctival hemorrhage or periorbital bruising. stimulation of the oculo-cardiac reflex that causes bradycardia, nausea, and syncope, and if not treated may lead to fatal arrhythmias. If the patient has impaired ocular movements, they may require urgent surgery to prevent necrosis of the muscles.

2. **Ears:**
   - Examine for a hematoma of the auricular cartilage. If there is a hematoma it needs to be drained and a 'through-and-through' bolster dressing is recommended. This is to prevent the permanent deformity of a cauliflower ear, with a possible compromise of the external canal.
   - Make sure the patient can hear with both ears.
   - Examine for blood and/or CSF leakage (which may be seen with a skull base fracture).
   - Examine for laceration or collapse of the external canal.
   - Examine the tympanic membrane for rupture or a hemotympanum.

3. **Nose:**
   - Examination of the nose starts with inspection for swelling or asymmetry, followed by palpation. Characteristic signs for nasal fractures are:
     - Pain
     - Bleeding
     - Swelling
     - Compromised nasal airway.
     - Crepitation
     - Palpable bony dislocation
   - It is very important to rule out a septal hematoma, as this must be drained to avoid an infection which can result in septal perforation. Nasal packing or splints should be inserted to prevent recurrence of hematoma.

4. **Intra-Oral Examination:**
   - **Inspection**:
     1) Open fractures.
     2) Asymmetries.
     3) Hematoma.
     4) Lacerations (including salivary ducts).
     5) Foreign bodies.
     6) Avulsed and luxated teeth.
     7) Malocclusion.
     8) Occlusal irregularities.
   - **Palpation**:
     1) Bimanual examination of mandibular segments to detect mobile fragment.
     2) Bons steps at zygomaticomaxillary buttress.

5. **Neck:**
   - Posterior neck: Cervical spine trauma.
   - Anterior neck: signs of laryngeal trauma. A missed laryngeal fracture can result in soft tissue swelling and a hematoma and consequently in rapid loss of the patient's airway. Placement of an endotracheal tube may be difficult or dangerous if a patient has a large hematoma. ICU observation of the airway and possible emergency tracheostomy should be considered. Elective intubation for midface surgery should be delayed.

6. **Neurological examination of the face:**
   - Examine the function of the sensory nerves of the face (supraorbital nerve, infraorbital nerve, and mental nerve).
   - Examine the function of the motor nerves of the face (frontal (temporal), zygomatic, buccal, marginal mandibular, and the cervical branch of the facial nerve). The most important branches to check are the zygomatic and the marginal mandibular.

7. **Fractures:**
   - It is crucial for decision making to ensure that one hand stabilizes the skull so that the examiner's contralateral hand can provide movements which can be assessed.
   - Possible clinical signs for maxillofacial fractures include:
     1. Facial swelling (edema, hematoma, emphysema) and deformity.
     2. Localized pain.
     3. In Midfacial fractures:
        1. Subconjunctival bleeding (hyposphagma).
        2. Oronasal bleeding
        3. Palpable and crepitating dislocated bony contour in periorbital region.
        4. Displacement of the globe (hyper-, hypo-, eno-, exophthalmos)
        5. Displacement of the medial canthal tendon (depending on the degree of NOE fracture)
        6. Compromised ocular motility.
        7. Double vision
        8. Sensory deficit (hypoesthesia, anesthesia, paresthesia) of the trigeminal nerve
        9. Occlusal disturbance
        10. CSF leakage (in case of anterior skull base involvement)

4. **In Mandibular fractures:**
   1. Limited painful mouth opening
   2. Malocclusion and bite abnormalities
   3. Bleeding from mouth
   4. Subluxated, avulsed or fractured teeth
   5. Anesthesia or paresthesia over lips
   6. Sublingual hematoma
   7. Trismus
   8. Deviation with mouth opening

Radiology:

- **Time to request:**

If a patient with Maxillofacial trauma requires a CT scan of other injuries, it may be an opportune time to scan their face, head, or C-Spine.

- **Modality**:
  - **CT imaging with 3D reconstruction is the golden standard as:**
    1. It helps for better fractures definition, as well the degree of fracture displacement and the need for reduction.
    2. It assesses the individual extent and type of fracture.
    3. It helps in diagnosis of Soft tissue problems e.g., Retrobulbar hematoma.
    4. It helps in Operative planning.
  - **Recommended scanning protocol for CT includes:**
    - 2-3 mm sliced thickness (orbital fractures: 1 mm)
    - Gantry = 0°
    - Hard- and soft-tissue window rendering
    - Field of view: complete skull (to visualize possible accompanying fractures or to scan for possible donor sites in case of bone grafting procedures) including the cervical spine.
  - **Cone-beam technology allows adequate determination of the hard tissue problems but is not equivalent to CT technology in terms of soft-tissue assessment. It has less exposure to radiation, So, more suitable for follow up.**
  - **Plain x.ray: Orthopantomogram (OPG) is the standard 2D imaging view for the mandible and Submentovertex view (Jug handle view) for zygomatic arch injuries.**
  - **MRI might be indicated to better detect soft-tissue problems such as:**
    1. Optic nerve edema or hematoma
    2. Ocular muscle disorders (incarceration, hematoma, disruption)
    3. Intraocular disorders (hematoma)
    4. Foreign bodies in the orbit

Intervention:

- Timing for intervention:
  Once hemostasis and resuscitation are achieved, Plan for prioritization of injuries & procedures.
- Midfacial fractures:
  The number of approaches depends on the extent of dislocation and comminution, & the degree of stability following reduction.

A. Observation

indications

1. Non- or minimally mobile fractures with unaffected occlusion in compliant patients with good dentition.
2. Nondisplaced stable fractures with premorbid occlusion in compliant patients.
3. Edentulous patient with minimal fracture displacement.
4. General condition of the patient not allowing for surgical intervention.

B. Open reduction internal fixation:

indications

Displaced fractures resulting in malocclusion or facial deformity.

Surgical approach:

1. Existing laceration.
2. Coronal incision:

   Access area:

   - Entire calvarial vault
   - Anterior and lateral skull base
   - Frontal sinus/Ethmoid
   - Zygoma
   - Zygomatic arch
   - Orbit (lateral/cranial/medial)
   - Nasal dorsum
   - Temporomandibular joint (TMJ)
   - Condyle and subcondylar region

3. **For Superolateral orbital rim:**

   Either:

   - **Lateral eyebrow approach**.
   - **Upper eyelid approach:** lower portion of the lateral rim is exposed more readily, and the lateral orbital wall can be inspected more widely.

4. **Glabellar incision**: where a limited exposure may be necessary in the nasofrontal area is needed as wider exposure need coronal incision. particularly desirable in an elderly patient who commonly has frown lines in the glabella.

5. **Subcillary or transconjunctival incision**: for floor, lateral orbital wall, and inferior rim.

6. **Indirect approaches to the zygomatic arch** (temporal "Gillies" and transoral "Keen" approaches).

7. **Intraoral maxillary vestibular approach** facilitates the exposure of the lateral buttress of the midface. It can also be used to expose the inferior orbital rim.

Principles for plating:

- According to the fracture morphology, a plate of appropriate profile, shape, and length is selected and contoured using bending pliers.
- The first hole is drilled (a drill bit with a stop may be used) next to the fracture line.
- The second screw is inserted next to the fracture line on the opposite side of the fracture.
- At least two screws per fracture fragment.
- The number, length, and size of screws vary according to patient anatomy.

Lines for plate fixation:

- The zygomatic arch.
- The frontozygomatic area.
- The nasofrontal junction.
- Zygomaticomaxillary buttress.
- Nasomaxillary buttress.

- **Orbit:**

  Orbital reconstruction indications

  1. Repair of critical sized orbital wall defects.
  2. Significant internal orbital defects proven by imaging.
  3. Disturbances of eye mobility that are the result of incarceration of ocular muscles.
  4. Enophthalmos
  5. Exophthalmos secondary to blow-in fractures.
  6. Hypophthalmos.

Contraindications:

1. Severe ocular trauma such as a rupture of the globe, hyphema, retinal detachment, traumatic optic nerve lesions, or other severe globe injury may necessitate delay of orbital wall repair.
2. General patient condition not allowing surgery.
3. Orbital fracture in the only seeing eye (relative contraindication)

- **Zygoma**:

  A. Closed treatment indications

  Displaced fracture amenable for minimally invasive reduction techniques such as bone hook or a Carroll-Girard type screw.

  Contraindications

1. Displaced comminuted injury of the zygomatic complex.
2. Stable reduction is not achievable using a closed technique.
3. The need for internal orbital reconstruction.

B. ORIF:

Indications:

1. Displaced fracture.
2. Comminuted fracture.
3. The need for internal orbital reconstruction.

Plating:

- The first step should be the placement of a plate at the frontozygomatic suture. only one screw on each side of the fracture, allowing the zygoma to swing into its proper position for reduction.
- After the other plates and screws have been placed at the zygomatic arch, infraorbital rim, and zygomaticomaxillary buttress, the final screws can be placed in the frontozygomatic plate.
- Reconstruction of the orbital floor should be performed after the zygoma has been reduced and fixated.
- A smaller plate is recommended for the infraorbital rim. A larger plate (commonly an L-shaped plate) is recommended for the zygomaticomaxillary buttress.
- **Mandibular fractures:**

A. Observation:

indications

Favorable, non-mobile non-displaced fractures with undisturbed occlusion. It requires a fully compliant individual who is willing to adhere to a non-chew diet and avo.d physical exercise and sports for a period of 6 weeks.

B. Closed Treatment (MMF):

Indications

1. Non- or minimally displaced simple fractures in compliant patients with good dentition amenable to MMF.
2. Premorbid or unstable medical condition preventing general anesthesia.
3. Conditions making open reduction and internal fixation difficult.

Contraindications:

Patients with psychiatric disorders, seizure disorders, and alcoholics.

C. Open Reduction and Internal Fixation (ORIF):

1. **Two Lag screws:**

indications

Oblique or sagittal fractures

2. **Lag screw and plate:**

Indications

a backup procedure for two lag screw procedure where only one lag screw could be inserted due to anatomical or technical reasons.

3. **ORIF, one miniplate and arch bar**

indications

1. Simple fractures in compliant patients with good dentition and buttressing of the segments after reduction.
2. Anatomical and technical limitation for the placement of two plates.

4. **ORIF, two plates**

indications

1. Arch bar is not possible because of missing teeth, loose teeth, or the objection to using an arch bar, or distal trailing fractures not amenable to the other treatments.
2. Simple fractures in transitional areas of the mandibular body.

5. **ORIF, one large plate**

indications

1. Reduced bone buttressing requiring load bearing fixation.
2. Delayed fracture treatment
3. Infection
4. Pseudarthrosis
5. Nonunion
6. If more stability is required

6. **ORIF, one large plate**

Indications

1. Decreased bone quality as in osteoporosis, edentulous and radiated mandible.
2. Comminuted fracture.

Surgical approach

1. Intraoral approach: The accessibility of the inferior border of the mandible decreases from the anterior to the posterior body region.
2. A trans buccal approach in the posterior area.
3. External approach: in comminuted, edentulous, atrophic mandible or with bone loss.

Plating

- Considerations of which MMF technique to be used will depend on fracture morphology, associated injuries, and personal preference.
- **Ideal lines for osteosynthesis:**
  1. **Symphysis:** the insertion of two plates along the upper and lower border of the mandible is mandatory because there may be rotational forces that have to be neutralized.
  2. **Body:** Arch bar and inferior border plating, Two plates (tension band and inferior border plate).
  3. **Angle and ramus:** Two plates as the bone quality may be lowered by impacted third molar.
     - The superior plate is inserted first to achieve preliminary fixation. The surgeon must be aware that a cortical plate may be very thin in this region and damage to the tooth roots is still possible using a 6 mm drill bit with stop and the screw should be monocortical.
     - An obstacle to plate placement is the exiting branches of the mental nerve. This area represents a danger zone for nerve damage. The bone region below the branches must be dissected carefully. The plate is positioned in the area below the mental foramen. The nerve branches must be mobilized out of the field during the introduction of the plate. During screw placement in the mental nerve area, the nerve branches must be protected.
     - check the occlusion for accuracy and the bony surfaces for precise anatomic reduction.

After care

1. **Diet**: Depending upon the stability of the internal fixation, the diet can vary between liquid and semi-liquid.
2. **Oral hygiene**:
   - A soft toothbrush (dipping in warm water makes it softer) should be used to clean the surfaces of the teeth and arch-bars.
   - Chlorhexidine oral rinses should be prescribed and used at least three times each day to help sanitize the mouth.
   - For larger debris, a 1:1 mixture of hydrogen peroxide/chlorhexidine can be used.
3. **Physiotherapy**:
   - At the first visit and opening and excursive exercises begun as soon as possible. Goals, 40 mm of maximum interincisal jaw opening should be attained by 4 weeks postoperatively.
   - If the patient cannot fully open his mouth, additional passive physical therapy may be required such as Therabite or tongue-blade training

- **Special Consideration:**
  - **Pan facial fractures:** Sequencing is either.
    1. Re-establish the maxillo-mandibular unit as the first major step of the sequencing (bottom-up).
    2. Starting with the reduction and fixation at the level of the calvarium and working in a caudal direction (top-down).

  - **Teeth in fracture line:**

    Indications for removal:

    1. Tooth luxated from its socket and/or interfering with reduction of the fracture.
    2. Tooth that is fractured.
    3. Tooth with advanced dental caries carrying a significant risk of abscess during treatment.
    4. Tooth with advanced periodontal disease with mobility which would not contribute to establishment of stable occlusion.
    5. Tooth with existing pathology such as cyst formation or pericoronitis.

Indications to leave:

1. Tooth that does not interfere with reduction and fixation of fracture.
2. If tooth removal requires removal of excessive amount of bone to compromise the fracture site a possible plate/screw fixation.
3. Tooth that is in good condition and assists in establishing occlusion and reducing the fracture.

National Multidisciplinary Guidelines For Reconstructive Considerations in Head and Neck Surgical Oncology

This document is considered the 2021 policy statement of the Egyptian Society of Plastic & Reconstructive Surgeons (ESPRS) to be nationally recognized and used as the general guidelines for reconstructive options after head and neck cancer resection. The document should be reviewed periodically by a consensus panel to consider revisions needed to reflect advances in the concerned scientific knowledge base of this entity. This document can be found and downloaded from our website: www.esprs.org

Introduction

Head and Neck Squamous Cell Carcinomas (HNSCCs), which include cancers of the oral cavity, oropharynx,and larynx, have an estimated annual burden of 330,000 deaths and more than 650,000 incident cases, making it the sixth most common cancer worldwide.[1] Oral squamous cell carcinoma (OSCC) is defined as a malignant tumor that occurs in the oral mucosa, tongue, lip, or other areas of the oral cavity. SCC accounts for nearly 90% of all head and neck cancers, and of all the anatomical cancers in the head and neck region, SCC occurs mainly within the oral cavity.[2,3] In 2003, OSCC was the eighth most common cancer in the world and became the sixth most common cancer globally in 2016.[4,5] In Egypt, studies have shown that HNSCCs account for about17–20% of all cancers.[6] Tobacco smoking, alcohol consumption, and infection by Human Papilloma virus (HPV) are considered the major risk factors for the development of these diseases.[7,8]

The problems of reconstructive surgery for the head and neck are variable and can be very complex.[9,10] The development of these guidelines required sufficient resources in terms of people with a wide range of skills, including head and neck expert clinicians, health services researchers, and group process leaders, and financial support. A systematic review had been performed to collect all available evidence, assess its potential applicability to the clinical question under consideration, inspect the evidence for susceptibility to bias, and extract and summarise the findings.

The guidelines have been divided into the management of the loss of skin, the maxilla, the mandible, including the associated soft tissues, the oropharynx and the laryngopharynx. There is very little level 1 evidence relating to the reconstruction of head and neck defects. Mandibular reconstruction techniques are relatively standard but some controversy remains regarding the midface and maxilla because of the complexity of the defects and the possibility of using a dental or facial prosthesis.

Most reconstructions are performed primarily following tumor extirpation, but secondary reconstructions are also undertaken to treat problems such as fistulae or osteoradionecrosis. Modern techniques aim for one-stage reconstruction utilizing vascularised tissues with a high success rate and good overall results.

Choice of reconstructive options depends on patient comorbidities, factors relating to the surgical defect, any future possible treatments including radiotherapy, and donor-site morbidity. No appropriately powered randomized controlled trials exist to determine flap selection in most instances and this is usually determined by the expertise of the individual surgeon. Patient factors include prior treatments, especially surgery and radiotherapy, and the patient's overall health including medical and social history.

1. Oral cavity soft tissues

The oral cavity comprises the area within the confines of the vermilion border of the lips, the floor of mouth mucosa, the buccal mucosa of the cheeks, and a plane passing through the junction of the hard and soft palates to the circumvallate papillae of the tongue. It is divided into several distinct areas including the lip, buccal mucosa, alveolar ridges (maxillary and mandibular), floor of mouth, retromolar trigone, hard palate, and oral tongue **(Fig. 1).[11]**

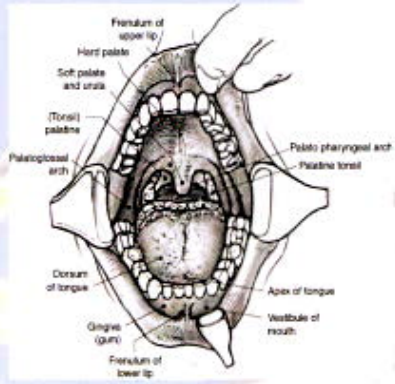


Fig. 1 Anterior and intraoral view of the oral cavity

The goals of successful oral cavity reconstruction are to recreate normal oral function, provide a satisfactory cosmetic result, and permit careful follow up. This can be challenging as oral cavity tumors can extent to involve a number of critical sites (i.e., mandible, paranasal sinuses, orbit and skull base) and cause significant functional disabilities in terms of airway, speech, swallowing, and/or mastication. A better understanding of normal oral function has resulted in the reconstruction of "like with like". A menu of reconstructive options includes grafts, local tissue rearrangement, pedicled flaps, and vascularized free tissue transfer. This permits the successful transfer of skin, muscle, and/or bone to an otherwise hostile environment. Successful rehabilitation would not be complete without the support of a variety of ancillary medical services including speech pathology, dietitians, and nursing staff. In addition, advances in the development of oral prostheses and dental implants have resulted in state-of-the-art and timely rehabilitation in patients with oral malignancies.[12]

Microsurgical techniques provide the mainstay of oral soft tissue reconstructions as they allow transfer of large volumes of healthy tissue from sites distant to prior surgical or radiotherapy fields. Flaps commonly used include the radial forearm flap (RFF) and the anterolateral thigh (ALT) flap. Less commonly the latissimus dorsi, rectus abdominus and flaps based on the scapular and/or para- scapular axis are utilized. More recently, the medial sural artery perforator flap (MSAP) and the superficial circumflex iliac artery perforator flap are being used.

1.1 The RFF allows for importation of a large, thin, pliable flap with excellent reliability and simplicity of harvest.[13] Multiple skin paddles can be designed, and the flap can be raised as a cutaneous, fasciocutaneous, fascial, adipofascial, osseofascial, or osseo- cutaneous flap. The principal disadvantage of this flap is the poor donor site aesthetics when skin grafting is required.

1.2 The ALT flap can replace most other flaps for soft tissue reconstruction of the oral cavity because of its versatility in design, long pedicle with a suitable vessel diameter, and low donor-site morbidity. This flap presents good functional results at the receiving site with the additional advantages of minimal donor-site morbidity and a high level of patient satisfaction.[14,15]

If microsurgery is considered, inadvisable local or regional flaps are still used. The facial artery myomucosal (FAMM) flap and the nasolabial flap can be useful to help close small defects. Regional flaps such as pectoralis major myocutaneous flap (PMMF), supraclavicular Artery Island Flap (SCAIF), contralateral submental island flap (CSIF), and thoracodorsal Artery Perforator (TDAP) Flap can be effective in importing tissue, but are not generally considered as a first choice.

1.3 The PMMF has been used commonly after salvage surgery and free flap failure due to the high failure rate of second free tissue transfers.[16] Its advantages lay mainly in the short operative time, ease of harvest, potentially large amount of well-vascularised tissue, and relatively low morbidity.[17]

1.4 The SCAIF provides an alternative to free-tissue transfer for soft-tissue reconstruction after oral cancer resection. The flap is easy to harvest and versatile. It provides an alternative to free-tissue transfer for soft-tissue reconstruction after oral oncologic surgery.[18–20]

1.5 The CSIF is a reliable flap that addresses the oncologic controversy and overcomes the disadvantages of an 2ipsilateral flap.[21]

2. Mandible

Mandible reconstruction has important functional and aesthetic aspects. The mandible contributes to airway stability, speech, deglutition, and mastication. Specific functional goals include preservation of tandem temporomandibular joint movement with maximal mouth opening and maintenance of occlusion. Aesthetic goals include symmetry, preservation of lower facial height, maintenance of chin projection, and replacement of submandibular soft tissue.[9]

Reconstruction of the mandible must address the site and size of the bony defect, associated soft tissue loss and the desirability of dental rehabilitation. Although mandible reconstruction can be achieved with a variety of methods, including bone grafts, metal reconstruction plates with or without soft-tissue flaps, and pedicled flaps, free tissue transfer is the mainstay of mandibular reconstruction. It allows importation of bone which can be tailored to fit the desired shape, is well vascularized, and is amenable to osseo-integration. Several flaps are commonly used with high success rates, including the fibula flap, deep circumflex iliac artery (DCIA) flap, scapular flap and, RFF.[22]

1.6 The fibular flap allows the harvest of a long piece of bone which is of adequate height for osseo-integration and can be osteotomised several times for contouring.[23,24] This is now made easier with the availability of software to plan the osteotomies at the mandible and on the fibula prior to transfer. It is relatively easy to harvest as an osseus or osteoseptocutaneous flap, with or without muscle. This versatility means it is the workhorse for mandibular reconstruction in most centers. One drawback of the flap is its relative lack of height

1.7 The DCIA flap provides a high bony segment, and the natural curve of the ilium lends itself to lateral mandibular defects where an osteotomy may not be necessary. The donor- site defect can be problematic and its skin paddle is usually reserved for external use, although muscle can be incorporated for oral reconstruction.

1.8 The scapular flap allows the harvest of a relatively small amount of bone. The main advantage of this flap is the large volume of skin and muscle (latissimus dorsi) that can be used. The bone is a good height, but two-team flap harvesting is generally not possible.

1.9 The RFF is rarely used for bone reconstruction as only a small volume of bone of low height can be harvested. There is a risk of subsequent fracture of the radius.

Mandible reconstruction algorithms are based on (1) the location of the bone defect and (2) the extent of soft-tissue involvement (Fig. 2).[9] Bone defects are classified as central (lying between the canine teeth), lateral, and hemimandible. Hemimandible defects differ from lateral defects by the presence of the condyle. The quantity and location of missing soft tissue are evaluated next. Features influencing flap selection include the absence of mucosal lining, skin, or both.

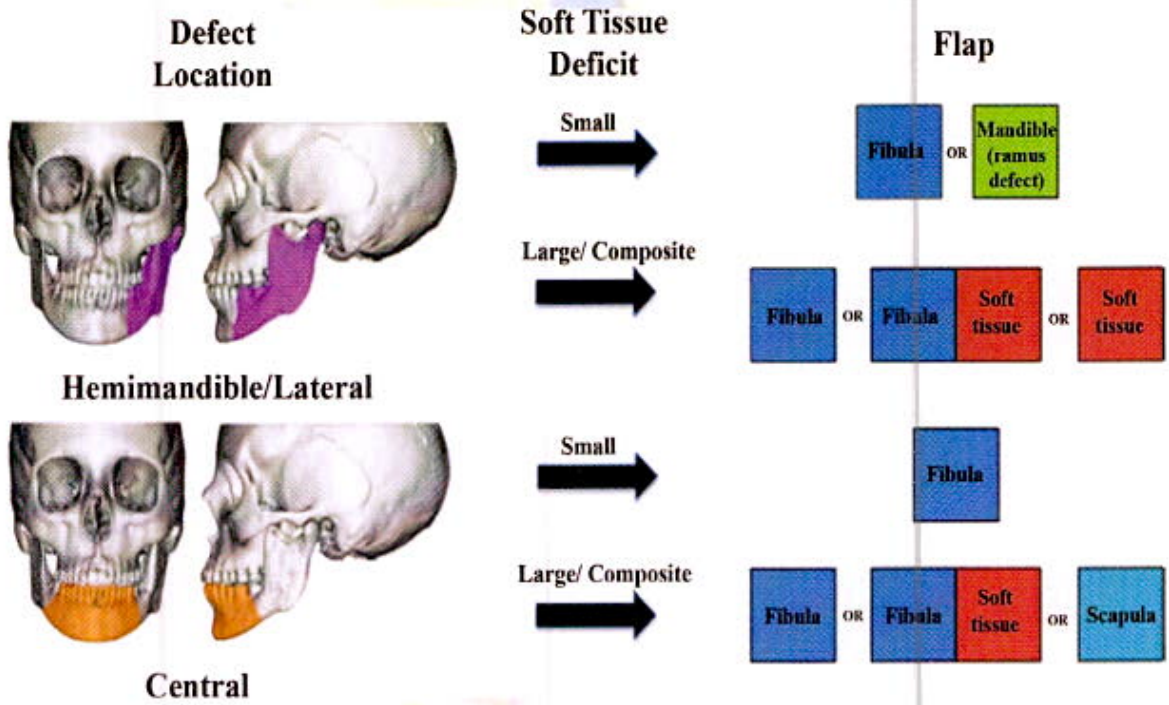


Fig. 2 Algorithm for reconstructive options of mandibular defects

The Egyptian Society for Head and Neck Oncology (ESHNO) introduced an algorithm for mandibular reconstruction in locally advanced carcinoma of the oral cavity based on the location of the defect (Fig. 3).

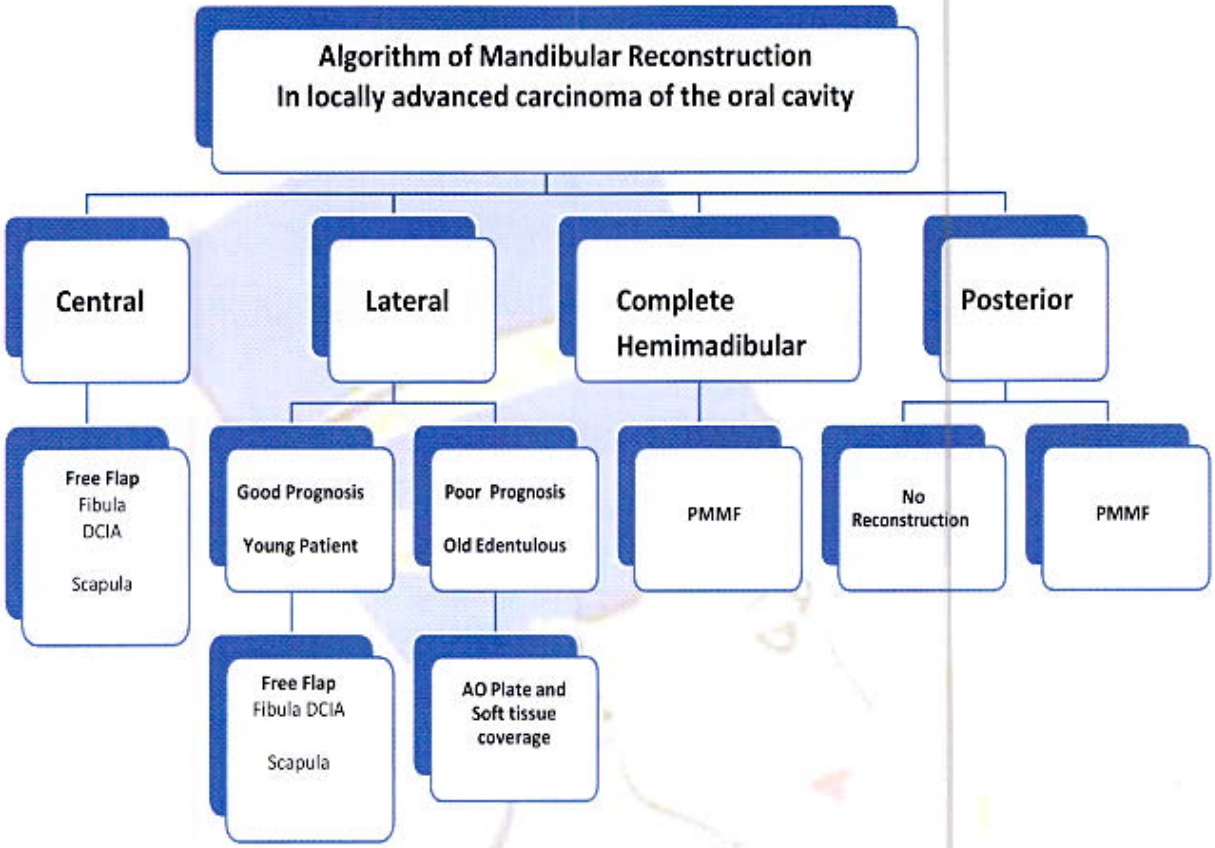


Fig. 3 Algorithm for reconstructive options of mandibular defects in locally advanced oral carcinoma

Dental rehabilitation is a key part of mandibular reconstruction and preoperative liaison with an appropriate team including consideration of osseo-integrated implants is mandatory.

3. Maxilla and midface

The paired maxillary bones are the pivotal structures of the midface, separating the oral, antral, and orbital cavities and providing support to the globes, lower eyelids, cheeks, lips, and nose. In addition, the maxillae play a critical role in speech, swallowing, and mastication. Maxillectomy defects can be treated by prosthetic obturation, autologous tissue reconstruction, or a combination of both. The level of evidence is very weak because of the differing complexity of the defects, and the potential for skull base involvement.

3.1 Prosthetic Rehabilitation

Rehabilitation with a palatal obturator has traditionally been the most common approach for treating maxillectomy defects. The advantages of this technique include short operative time and hospital stay, and complete visualization of the maxillectomy cavity, which simplifies surveillance for tumor recurrence. Successful obturation depends not only on the size of the defect but also on the presence of the remaining dentition.[25] Successful obturation of maxillectomy defects involving up to 50 percent of the hard palate and alveolus is less predictable because there are fewer teeth for clasping and less hard palate and alveolus available to support the prosthesis. Defects that involve more than 50 percent of the palate can rarely be obturated because of lack of support and the excessive weight of the prosthesis.

Even though prosthetic rehabilitation provides good functional results in reconstruction of modest palatal defects, there are other limitations inherent in all obturators. These include difficulty with keeping the maxillectomy cavity clean, the inability to eat or communicate effectively without the device, and the need for periodic readjustment of the obturator because the size and shape of the palatal defect can change over time.**[26,27]**

3.2 Autologous Reconstruction

Microvascular free flaps are usually preferred to local and regional flaps, which have limited volume and reach, for maxillary reconstruction. The most useful algorithm has been described by Cordeiro and Santamaria (Level of Evidence: Therapeutic, IV) (Fig. 4).[28] This algorithm is based on restoring the various walls of the maxillary bone, which they conceptualize as a hexahedron bounded by the orbit above, the cheek anteriorly and laterally, the nasal cavity medially, the skull base posteriorly, and the oral cavity inferiorly.

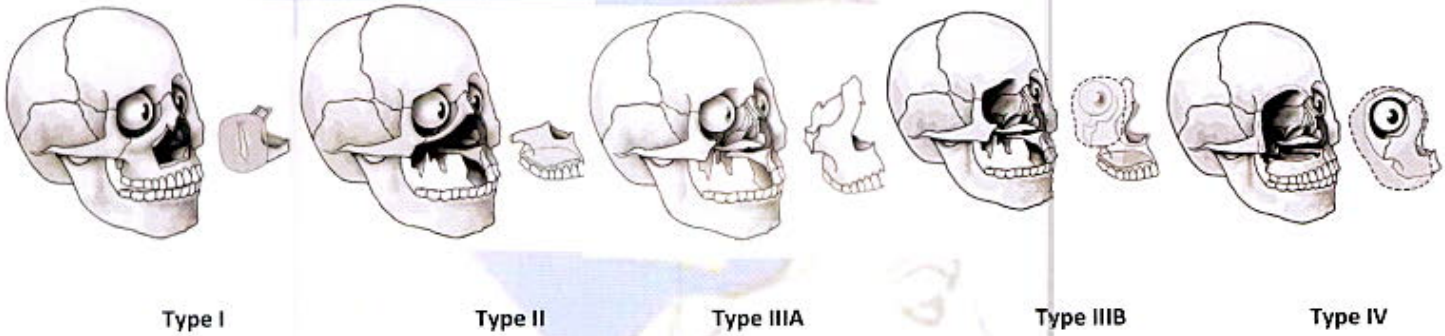


Fig. 4 Types of maxillectomy defects

1.2.1. **Type I (limited maxillectomy defect)** includes resection of the anterior and medial walls associated with skin and soft tissue resection. It is addressed with a fasciocutaneous free flap with two skin islands, if necessary, to cover grafts and restore the cheek skin and nasal lining.

1.2.2. **Type II (subtotal maxillectomy defect)** includes resection of the lower five walls of the maxilla but not the orbital floor. An osteocutaneous free flap as fibula or RFF is indicated to restore palatal competence and bony support for either a denture or osseointegrated dental implants.

1.2.3. **Type IIIA includes all six walls of the maxilla,** including the floor of the orbit and the hard palate, which are resected, preserving the orbital contents. The orbital floor is reconstructed with bone graft of titanium mesh. The alveolar margin and the lateral nasal wall are reconstructed with either fibula osteocutaneous flap or scapula chimeric flap. In patients who are not free flap candidates, reconstruction can be performed with a temporalis muscle pedicled flap, transposed anteriorly by temporarily removing the zygomatic arch, which is later replaced.

Type IIIB includes all six walls of the maxilla, and the orbital contents, are resected. A multiple skin paddle flap as ALT or rectus abdominis myocutaneous free flap is used to resurface the external skin defect and palatal defect, and, if possible, the lateral nasal defect, although this surface will mucosalize spontaneously over time if a skin paddle is not used to line the nasal cavity.

1.2.4. Type IV includes the upper five walls of the maxilla, including the orbital contents but sparing the palate, which are resected. A myocutaneous flap as ALT with vastus, Latissimus dorsi flap, and rectus flap can be used.

1. Hypopharynx Reconstruction

The hypopharynx is the portion of the pharynx immediately posterior to the larynx. Its other name, the laryngopharynx, underscores its close association with the larynx and more appropriately describes the nature of oncologic surgery in this complex region of the neck. Anatomically, the laryngopharynx extends from the hyoid bone to the lower margin of the cricoid cartilage. Through contraction and passive relaxation of pharyngeal musculature, it allows smooth passage of the food bolus and oral secretions from the oral cavity/oropharynx to the cervical esophagus.

The primary goal of laryngopharynx reconstruction is to improve health-related quality of life by restoring alimentary tract continuity so patients can eat and can handle oral secretions. Reliable restoration of normal breathing and speech following concomitant laryngectomy is not possible with current reconstructive techniques. Reduced to its simplest form, the laryngopharynx can be thought of as a cylindrical conduit connecting the oropharynx and esophagus.[9]

Reconstructive algorithms are based on the amount of the laryngopharynx circumference missing and the extent of soft tissue involvement to adjacent regions, including the nasopharynx, oropharynx, and neck skin (Level of Evidence: Therapeutic, IV).[29]

1.1 **Type I:** defects involving less than 50 percent of the laryngopharynx circumference are generally reconstructed with fasciocutaneous free flaps such as the RFF or ALT. The SCAIF or PMMF provides an alternative to free tissue transfer.

1.2 Type II: defects involving more than 50 percent of the circumference of the hypopharynx or circumferential require reconstruction of the complete laryngopharyngeal cylinder. The two most common flaps used in this scenario are the tubularized ALT flap and the free jejunum. Alternatively, a transaxillary TDAP flap is a dependable pedicled flaps that can be performed for these defects. Current methods of voice reconstruction lag behind. Patients commonly use an electrolarynx or surgically created fistula between the esophagus and trachea called a tracheoesophageal puncture.

4.2.1. Reconstruction with an ALT flap requires a flap width of 9.4 cm to achieve the 3-cm diameter of the native cervical esophagus (Level of Evidence: Therapeutic, IV).[30] Important technicalities include an oblique opening at the proximal end of the flap to match the enlarged opening of the base of the tongue. Insetting a triangular lip of distal anterolateral thigh flap into a slit in the esophagus reduces ring strictures at the distal enteric anastomosis. The longitudinal anterolateral thigh seam is placed posteriorly along the prevertebral area to contain leaks, prevent vascular compression, and position vessels anteriorly for microvascular anastomosis. The flap fascia is wrapped around the tubed flap to reinforce suture lines.

1.2.1 The jejunal flap is generally based on the second or third mesenteric arcade, approximately 40 cm beyond the ligament of Treitz. This area is chosen because the mesenteric arcade (and flap vessels contained within) is the longest at this location, thereby facilitating microvascular repair. The flap is oriented with a stitch so that isoperistaltic orientation is maintained after transfer to the neck. Microsurgical anastomosis is performed ideally in less than 2 hours, because the intestine tolerates ischemia most poorly of all flaps. Separation of the mesenteric artery and vein is limited; thus, recipient neck vessels need to lie in close proximity. The distal enteric anastomosis needs to be performed on gentle stretch to prevent bowel redundancy.[9]

1.2.2 The pedicled TDAP flap can reach the defect through a transaxillary retroclavicular tunnel by blunt finger dissection to avoid injury of the subclavian vein and the brachial plexus. Dissection continues with bimanual assistance of the other hand to come out at the posterior triangle of the neck. The tunnel is widened to accommodate the passage of at least two fingers. A long artery forceps is introduced cautiously through the tunnel from the neck to reach the axilla and hold the flap. The flap is pulled through the tunnel to reach the neck and is then passed medially under the sternomastoid muscle.[31]

1.3 **Type III:** defects are extensive noncircumferential defects involving multiple anatomical levels that require soft tissue bulk; thus, the vertical rectus abdominis myocutaneous (VRAM) flap and the ALT flap with vastus lateralis muscle are the preferred flaps.

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Guideline of Hand Surgery

What is Hand Surgery

- Hand Surgery is a broad term, which encompasses the multidisciplinary management of conditions of the hand. Most conditions do not require surgery and most surgeons manage more than just the hand. The remit is generally defined as "Assessment and management of conditions affecting the hand, soft tissue integuments and peripheral nerves of the upper limb".
- A specialty employs combined skills from the overlapping specialties of Plastic sand orthopedic surgery. Input may be required from other fields to include Rheumatology, Neurology, Neurophysiology, Pain Medicine and Psychology. Hand Therapists (trained from the allied disciplines of Occupational Therapy and Physiotherapy) are crucial in maintaining or restoring the pain free movement and sensibility upon which a functioning hand depends.
- The surgical treatment of hand conditions employs more diverse skills than many other surgical disciplines, encompassing small bone fixation, microsurgery and the reconstruction of skin, muscle, tendon and nerves.
- A Hand Surgeon is an experienced clinician with appropriate specialized training, diagnostic capability and surgical dexterity. Some Hand Surgeons subspecialize yet further and manage more complex conditions such as microsurgical reconstruction, peripheral nerve surgery, brachial plexus surgery and congenital hand surgery. Many Hand Surgeons are still engaged in the general workload of their parent specialty, in which case they might be defined as an "Plast c Surgeon, or Orthopedic Surgeon, with a special interest in Hand Surgery"

Current Hand Surgery delivery in Egypt

There are various facilities to provide hand surgery services in Egypt from small rooms in general surgeries through minor injuries units, local hospitals, independent treatment centers and regional centers. Small number of well-trained plastic surgeons as well as Orthopedic Surgeons in the field of hand surgery carry the load of management of the complications coming from all over the country.

Hand Trauma predominantly affects the young working population and are a major source of disability, causing significant costs to the individual and society through time off work. Hand trauma care is delivered by GPs, Minor Injury Units, Accident Departments District General orthopedic services, general plastic surgery services, regional hand centers and Major Trauma Centers. The majority of hand injuries are suitable for management as a day case procedure, under either local or regional anesthesia.

Elective Hand Surgery faces increasing demands. Demand for operations for common hand conditions (e.g. carpal tunnel syndrome, Dupuytren's Disease,). Most operations on the hand cause moderate pain that can be controlled by oral analgesic medication and almost are suitable for day surgery.

Hand therapy is fundamental to achieving good results from hand surgery, and is integral to the outpatient management of hand disorders.

Radiology particularly ultrasound, 3D CT and MRI have improved the care of patients with hand conditions.

Regional Anesthesia supports efficient and safe delivery of hand surgery.

Nursing expertise is required for complicated wound care. Children's Hand Surgery Services need particular facilities and expertise.

Recommendations for delivery and future development

Training needed to perform safe hand surgery

- In addition to basics of plastic surgery training, the plastic surgeon should pass experimental basic microsurgery course in special training laboratories.
- At least 2 years of training in evaluation and assessment of hand injury cases as well as common hand conditions and congenital anomalies
- 2 years training in management of hand injuries of all its varieties: microsurgical revascularization, replantation, tendon repair, microsurgical nerve repair, small bone fixation,
- brachial plexus surgery as well as soft issue coverage
- 2 years training in management of common hand conditions e.g. Hand tumors, congenital hand anomalies, postburn hand sequaele, Duputryen disease, trigger fingers, entrapment syndromes.
- 2 years training in secondary nerve and tendon reconstruction.

Elective Treatment

- As more simple hand surgery procedures move into primary care and to other non-mainstream teaching facilities, steps must be taken to ensure that trainee hand surgeons are not deprived of essential training opportunities.
- Most elective soft-tissue operations on the hand should be carried out in day surgery facilities
- Regional anesthesia under tourniquet control or Wide Awake Local Anesthetic No Tourniquet (WALANT) techniques should be developed further.
- All-day operating lists are more efficient than half-day lists and should be in place wherever possible.
- The term "Procedures of Limited Clinical Value" should be abandoned if considered in light of fact. The treatment of carpal tunnel syndrome and trigger finger provides significant clinical value with demonstrable patient benefit and high satisfaction ratings.
- Dupuytren's surgery is complex with a risk of debilitating complications and poor outcomes. It should be performed in a hand surgery rather than general environment. This means proper hand surgery training, suitable anesthesia, mandatory magnification and specialized hand therapy and wound care follow up.
- Whilst assessment by less experienced person in a multidisciplinary **Clinical Assessment & Treatment Services might appear** to offer cost savings and quicker treatment, for every patient whose condition is beyond the diagnostic knowledge or treatment skills of that person and thus needs to see a specialist, there will be duplicated cost and extra delay. There is also the medicolegal risk of missed diagnosis or inappropriate treatment. Integration of the Hand Surgeon into the initial triage of referrals and into the multidisciplinary clinic team is strongly advised.
- Units performing hand surgery should have access to appropriate intra-operative fluoroscopy imaging, such as the mini-C arm, to facilitate fracture manipulation and fixation whilst minimizing the radiation dose delivered to the patient and staff. Mini C arms convey the additional advantage of the surgeon operating the machine without the need for a radiographer.

Hand Trauma

- Hand injuries should be treated by surgeons with expertise in hand surgery supported by Hand Therapists
- Most hand emergency cases can be treated as day-cases, especially if there are good arrangements for regional anesthesia. Hospitals should be encouraged to provide day surgery facilities for hand trauma cases.
- The only cases that need immediate surgical interference in hand surgery are:
    1. Active bleeding that does not stop by conservative measures
    2. Vascular compromise of the extremity in the form acute ischemia or venous congestion that requires emergency replantation or revascularization according to the well -known time window
    3. Compartment syndrome
- Clean tendon or nerve divisions are suitable for immediate repair. However, irrigation and dressing of the wound in the Emergency Department, followed by operative repair, as a day-case on a daytime operating list in the next 5 to 7 days is also appropriate. These cases should be either discussed with the hand surgery team on call on the day of injury or referred into a hand trauma clinic within 72 hours.
- Hand surgery care should have a low threshold for accepting referral from the Emergency Department and Minor Injury Units, where staff may not have the expertise or support to distinguish between a "minor" hand injury of minimal significance and a "minor" injury that leads to a poor outcome without specialist care.
- Direct access to specialist Hand Trauma clinics and Hand Therapy Departments should be provided for Emergency Departments and Minor Injury Units to allow appropriate follow- up care of minor hand injuries whose initial treatment has been performed in the emergency department.

Support services

- Good clinical outcomes depend on skilled hand therapy. All units performing hand surgery must have the sufficient hand therapy support. Therapists should be present in hand surgery outpatient clinics. The extended roles of hand therapists and specialist nurses in the outpatient clinic should be encouraged
- Combined rheumatologist-hand surgeon clinics are to be encouraged.
- Professional relationships with the radiology and neurophysiology departments are essential

General rules of hand surgery

- Air inflated calibrated tourniquet is necessary for most hand operations
- The tourniquet either automatically or manually inflated with a scale showing the pressure is the only allowed type.
- Well padding of the upper arm with clean dry cotton without wrinkles should be done. The edges of the cotton pad should be seen above and below the applied tourniquet cuff. The tourniquet cuff is never applied directly on the skin. The edges of the tourniquet should rest on cotton pad to avoid tourniquet palsy.
- Exsanguination of the limb distal to the tourniquet may be needed in some cases.
- It should be elevated 100 mm hg above systolic blood pressure of the patient for not more than 90 minutes. If more time is needed, deflation for 10 minutes is done before re-inflation. The timing of inflation and deflation of the tourniquet should be recorded. It is a combined responsibility of the surgeon and the anesthesiologist.
- Magnification is mandatory by either loupe magnification or surgical microscope according to the case.

- Very delicate instrumentation to avoid tissue crushing
- Perioperative antibiotic is needed before tourniquet elevation
- Adequate standard exposure incisions according to the case.
- Meticulous tissue handling with the use of fine toothed bipolar electrocautery for hemostasis.
- Detailed surgical procedure is performed according to the case
- Postoperative splinting, hand elevation and rehabilitation program according to the case.
- Pre, intra and postoperative photography and videography documentation is recommended when needed.

GOALS of guidelines

i. Reduce avoidable harm to patients. With surgical interventions, there is always a risk of complications. Weighing the risks and benefits of appropriate treatments should be co- produced with patients.
ii. Save precious professional time, when the NHS is severely short of staff professionals should offer appropriate and effective treatment to patients.
iii. Help clinicians maintain their professional practice and keep up to date with the changing evidence base and best practice.
iv. Create headroom for innovation. If we want to accelerate the adoption of new, proven innovations, we need to reduce the number of inappropriate interventions.
v. Maximize value and avoid waste.

Herein are the guidelines for management most commonly met hand conditions.

Revascularization/Replantation
Referral category:

The case should be discussed urgently with a specialist service with immediate transfer for assessment if indicated.

Consent – principle of shared decision-making

- Discussion with the patient should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes
- Discussion of likely treatment program and outcomes
- The patient's values, occupation and hand function requirements should be discussed and considered in a joint decision making process
- Examples of this:
    - Whether to replant or amputate a single digit in a manual worker
    - Whether to replant in zone II
    - Implications for time off work and handtherapy

Non-operative management options

An entirely non-operative approach would rarely be advised minimal procedures might include wound washout and closure of amputation.
Where this option is selected, the patient should have access to hand the rapy for supervision and rehabilitation.

Indications of acute amputation

- Crush injuries with warm ischemia time >6 hours or cold ischemia time >24 hours for fingerers.
- Crush injuries with warm ischemia time >4 hours or cold ischemia time >12 hours for forearms & arms
- Serious associated polytrauma.
- Severe ipsilateral hand trauma.
- Double level crush injuries.
- Bad general condition of the patient

Operative management requirements (when replantation is opted for) Timing

- Within 24 hours of cold ischemia or 6 hours of warm ischemia for a digit 4 hours for cold ischemia and 2 hours of warm ischemia for any part with muscle Involved

Staff

- Done by a surgeon who has microsurgery expertise or supervised by them and done by a surgeon with microsurgical skills
- The scrubbed member of theatre staff (ODP or Scrub nurse) should be familiar with microsurgical instrumentation

Environment

- Replantation or revascularization surgery should take place in a designated operating the atre using an operative microscope

Equipment

- Adequate light
- Microsurgery set for replantation
- Hand surgery instrumentation
- Appropriate fracture fixation equipment
- Appropriate microsuture material
- Intra-operative X-Ray facilities
- When needed, Tourniquet and the associated infrastructure

Anesthesia: General or regional by a competent anesthesiologist

Technical aspects:

The sequence of events are:

- Identification of structures, arteries, veins, nerves, tendons, muscles
- Bone shortening and fixation
- Arterial repair using microsurgical technique
- Venous repair using microsurgical technique
- Tendon and or muscle repair
- Nerve repair using microsurgical technique
- In cases of multiple digits, priority for thumb then index and if possible the middle finger.
- Use of best-amputated parts regarding length and integrity of structures.
- Transfer between digits can be done.

Additional measures

- The use of pharmacological agents to reduce nerve pain should be considered, & where appropriate started early.
- Intra and postoperative use of anticoagulants
- Antibiotics should be used preoperatively with choice of agent as per local guidelines for an open fracture

Postoperative hand therapy requirements

- Inpatient care should be used initially to monitor the vascularized part and provide early therapy interventions. Revision of the vascular anastomosis may be needed in the early postoperative period up to 2 weeks.
- Access to a competent hand therapist who will provide support and instruction to regain range of motion at the appropriate speed. If not available, the surgeon can supervise the hand therapy.

Outcomes to be expected

- The range of injuries is too great to have a meaningful outcome expectation for individual cases.
- Early complications like blockage of the anastomosis, secondary hemorrhage, wound infection, sloughing of part of the replant may occur.
- Failures of replantation or revascularization and the need for amputation of the replanted or re vascularized parts are to be expected and accepted in these cases.
- Further surgical interference may be needed in the early postoperative period like further debridement, soft tissue coverage
- Late operative interference may be needed like bone remodeling, joint release, tendon surgery, nerve surgical interference, or even amputation for handicapping replant.
- Final functional deficits with different grades either sensory or motor, joint stiffness, finger or extremity shortening are to be expected and accepted in these cases.

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Mangled Upper extremity

Mangled is the descriptive term for an injury caused by cutting, tearing, avulsion or crushing, resulting in a limb becoming unrecognizable. A mangled extremity usually results from major trauma and often combines significant injuries to three or four of the tissue types (bone, skin, arteries, nerves, muscles and tendons). Despite advances in microsurgical techniques, the treatment of severely injured limbs remains a great challenge to the reconstructive surgeon. Limb salvage can be difficult in its own right, and the restoration of good limb function can be an even greater challenge. However, limb salvage should be attempted where possible, and at the very least the salvage of as much viable tissue as possible

Referral category: The case should be discussed urgently with a specialist service with immediate transfer for assessment.

The initial assessment

The initial management of the mangled limb should follow the Advanced Trauma Life-Support (ATLS) guidelines, which aim to resuscitate and stabilize the patient and address any immediately life-threatening injuries.

- **Mainly clinical**
  - A careful clinical examination of the injured extremity is performed. Particular attention is given to the limb vascularity, skeletal stability, motor & sensory deficit, and soft tissue and skin loss.
  - Tissue ischemia time is also an extremely important factor infection risk greatly increased hours of cold ischemic time. Muscles are intolerant of a warm ischemic time of more than four to six hours (12 h of cold ischemia), though the hand & digits can " survive" up to the 24 hours of cold ischemia.
  - There is also a greater risk of compartment syndrome early in the post injury period, & one must have a low threshold for performing fasciotomies.
- Plain X-ray
- Hand held Doppler.
- Pulse oximetry.

Consent – principle of shared decision-making

- These complex injuries are accompanied by significant tissue damage with tissue ischemia, vascular impairment and thrombosis, and are associated with high levels of infection. Patient factors are also important, and functional outcomes depend on the patient age, general health status (the coexistence of peripheral vascular disease, diabetes mellitus, and atherosclerosis), patient psychology and expectations, and the use of steroids and other immunosuppressants. One should base the treatment plan on the expected levels of function one might obtain after surgery and rehabilitation.
- Discussion with the patient should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes.
- Discussion of likely treatment program and outcomes
- The patient's values, occupation and hand function requirements should be discussed and considered in a joint decision making process.

Operative management requirements

Timing

Within 24 hours for non-ischemic limb. 6 hours for cold ischemia and 4hours of warm ischemia for any part with muscle Involved.

Staff

Team

Approach

- Plastic surgeon with hand surgery and microsurgical expertise
- Orthopedic surgeon
- Vascular surgeon

Environment

- Mangled extremity surgery should take place in a designated operating theatre using an operative microscope

Equipment

- Adequate light
- Magnifying loupe or operative microscope according to situation
- Microsurgery set for replantation
- Vascular surgery set
- Hand surgery instrumentation
- Set for soft tissue reconstruction
- Appropriate suture material
- Fibrin glue if needed
- Appropriate fracture fixation equipment
- Intra-operative X-Ray facilities
- When needed, Tourniquet and the associated infrastructure

Anesthesia: General or regional by a competent anesthesiologist

Additional measures

- The use of pharmacological agents to reduce nerve pain should be considered, and where appropriate started early.
- Intra and postoperative use of anticoagulants
- Fluid therapy and blood transfusion guided by lab results and urine output and or CVP
- Antibiotics should be used preoperatively with choice of agent as per local guidelines for an open fracture

Operative aspects

- Tissue lavage, debridement & assessment of the extent of injury done by Plastic surgeon with hand surgery and microsurgical expertise.
- Bone shortening and Fixation that allow end to end nerve repair and if possible end to end vascular repair (done by orthopedic surgeons for long bone and or plastic surgeon with hand surgery expertise for small bones
- Revisualization.
- For injuries above the elbow, done by vascular surgeon and or plastic surgeon with microsurgical expertise (vein grafting may be needed).
- For hand below elbow injuries, done by Plastic surgeon with hand surgery and microsurgical expertise (vein grafting may be needed).
- Neural repair (done by Plastic surgeon with hand surgery and microsurgical expertise
- Tendons and muscles repair (done by Plastic surgeon with hand surgery and microsurgical expertise

- (done by Plastic surgeon with hand surgery and microsurgical expertise.
- Adequate soft tissue coverage (done by Plastic surgeon with hand surgery and microsurgical expertise. Second look may be needed after 24-48 hours.
- Postoperative rehabilitation therapy

Indications of acute amputation

- Crush injuries with warm ischemia time >6 hours.
- Serious associated polytrauma.
- Severe ipsilateral hand trauma.
- Double level crush injuries.
- Bad general condition of the patient

Postoperative care and hand therapy requirements

- Inpatient care should be used initially to monitor the vascularized part and provide early therapy interventions. Revision of the vascular anastomosis may be needed in the early postoperative period up to 2 weeks.
- Postoperative appropriate splinting
- Access to a competent hand therapist who will provide support and instruction to regain range of motion at the appropriate speed. If not available, the surgeon can supervise the hand therapy.

Outcomes to be expected

- The range of injuries is too great to have a meaningful outcome expectation for individual cases.
- Early complications like blockage of the anastomosis, secondary hemorrhage, wound infection, sloughing of part of the limb may occur.
- Failures of revascularization and the need for amputation of the vascularized parts are to be expected & accepted in these cases.
- Further surgical interference may be needed in the early postoperative period like further debridement, soft tissue coverage
- Late operative interference may be needed like bone remodeling, joint release, tendon surgery, nerve surgical interference, or even amputation for handicapping extremity.
- Final functional deficits with different grades either sensory or motor, joint stiffness, finger or extremity shortening are to be expected and accepted in these cases.

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Lacerations with flexor tendon involvement

Referral category: The patient should be seen at the next available soft tissue hand clinic (ideally within 24 hours).

Consent – principle of shared decision-making

- Discussion with the patient should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes
- The patient's values, occupation and hand function requirements should be discussed and considered in a joint decision making process
- Examples of this:
  - Whether to repair an isolated forearm laceration of FDS to the little finger
  - Whether to repair FDP or FDS if one is intact
  - Sacrifice of FDS and only repair of FDP in difficult and delayed cases of zone 2 injuries.

Non-operative management options

When non-operative management has been selected, the patient should be given access to a competent hand therapist for supervision of their recovery to a functional range of motion

Operative management requirements

Timing

- Within 4days. Delay may add to difficulty of repair and may end with up tendon rupture
- Primary repair will be difficult to be done after 10 days and tendon grafting may be needed
- Delay after 2 weeks may necessitate 2 stages tendon reconstruction

Staff: Done or supervised by a surgeon who is competent in flexor tendon repair

Environment

- Tendon repair involves the insertion of foreign material into a relatively poorly vascularized structure and should be carried out in a designated operating theatre

Equipment

- Adequate Light
- Hand surgery instrumentation
- Appropriate sutures (polypropylene, Nylon, Ethibond)
- Tourniquet and the associated infrastructure
- Loupe magnification
- Bipolar diathermy with fine tip

Anesthesia: General or regional by a competent anesthesiologist

Additional measures

- Antibiotics should be used perioperatively with choice of agent as per local guidelines.

Technical aspects

Extending the incision for flexor tendon repair

- The incision for the flexor tendon repair should allow visualization of the cut ends and should provide enough space to repair the tendons. Many standard incisions have been reported.
  Brunner incision is preferable if the wound of injury allows that

Partial injury of the flexor tendons

- If the injury involves less than 50% of the tendon substance there is no need to suture, rather the frayed cut ends could be trimmed and the surface made smooth. Immediate active movement should be encouraged to avoid adhesions.
- Laceration involving more than 50% of the tendon should be repaired with a core suture and mobilized as per the flexor tendon mobilization protocol.

Retrieval of the tendon ends

- The proximal tendon end, if not retracted too proximally, may be brought into the site of injury by flexing the wrist and by proximal-to-distal milking which helps in pushing it distally. If it cannot be achieved it can be grasped very gently using a fine hemostat and brought into the wound. This could be tried only once lest the tendon edges get ragged.
- If any of these maneuvers fail, one should not hesitate to extend the incision proximally (Brunner zigzag fashion) to find the proximal end or make a separate incision just proximal to the A1 pulley in the palm. Once the proximal cut end is found the tendon end can be delivered to the injury site through the flexor sheath using a fine plastic tube or silicone catheter.
- For distal ends, flexing the fingers and extending the incision distally.

Partial injury of the flexor tendons

- If the injury involves less than 50% of the tendon substance there is no need to suture, rather the frayed cut ends could be trimmed and the surface made smooth. Immediate active movement should be encouraged to avoid adhesions. Laceration involving more than 50% of the tendon should be repaired with a core suture and mobilized as per the flexor tendon mobilization protocol.

Management of pulleys during tendon repair

- Up to 25% of the A2, pulley and 75% of the A4 and 25% of the A2 and A4 together can be excised without significant effects. After flexor tendon repair, the surgeon should move the finger and make sure that the repair site traverses comfortably without being stuck into any of the pulleys. If the gliding is not smooth, venting of the pulleys should be done to allow free movement of the repair site.
- A suitable core suture should be selected for the size of the tendon. For example in an adult zone 2 this would be a minimum 4 strand locking configuration with at least a 4.0 caliber Suture.
- In Zone II, FDS may be sacrificed if there is difficulty or the repair would be so bulky for good gliding function. For the index finger, FDS should be repaired as can as possible.
- The technique used and level of the laceration as well as which pulleys have been damaged or released must be clearly documented in the operation note.

Therapy requirements

- Postoperative splinting for 6 weeks.
- Access to a competent hand therapist who will provide the support needed for a controlled active motion rehabilitation regime.
- The first visit to a therapist after surgery should take place in 3-5 days.
- Patients should be offered therapy at weekly intervals for the first 6 weeks at least.
- There should be easy communication and rapid access to the surgical team if the therapist has concerns at any point.
- Follow up should continue to a minimum of 12 weeks.

Outcomes to be expected

- In the absence of a rupture or infection, the patient should be able to expect a functional range of active motion at 3 months from injury depending on the level of tendon injury, associated injuries and patient compliance to postoperative hand therapy.
- Complications up to 20% of cases have been reported in the form of wound infection, rupture of repair, postoperative adhesions with functional deficits.
- Redo operation may be needed in cases of tendon rupture either early or late 2 stages tendon reconstruction according to the situation.
- Tenolysis may be needed 6 months after repair if there is limitation of active movements with normal passive range of movement.

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Secondary flexor tendon Reconstruction

Secondary flexor tendon reconstruction is a term used to describe reconstruction of injured flexor tendons that were not repaired in the 1st 4 weeks after trauma. It is also used for cases that have been previously repaired with poor outcome because of adhesions, rupture, and infection.

Referral category: The patient should be seen at the next available soft tissue hand clinic.

Consent – principle of shared decision-making

- Discussion with the patient should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes
- The patient's values, occupation and hand function requirements should be discussed and considered in a joint decision making process.
- Examples of this:
  - Whether to repair FDP or FDS if one is intact
  - Sacrifice of FDS and only repair of FDP in cases of zone 2 injuries.
- Explanation to the patient that 2 stages procedure may be needed
- Explanation to the patient the incisions site and the donor tendon graft sites.

Non-operative management options

When non-operative management has been selected, the patient should be given access to a competent hand therapist for supervision of their recovery to a functional range of motion.

Operative management requirements

Timing and Prerequisites

- Supple joints with good passive ROM
- Satisfactory finger circulation
- Good sensation
- Soft scars and skin cover
- Cooperative patient

Staff: done or supervised by a surgeon who is competent in secondary tendon repair.

Environment

Tendon repair involves the insertion of foreign material into a relatively poorly vascularized structure & should be carried out in a designated operating theatre.

Equipment

- Adequate light.
- Hand Surgery instrumentation.
- Appropriate sutures.
- Tendon spacer should be standby.
- Tourniquet & the associated infrastructure.
- Loupe magnification.
- Bipolar diathermy with fine tip.

Details of tendon reconstruction: one of the following may be used or combination of more than 1 procedure

- End to end repair (rare)
- Tenolysis of previously repaired tendons
- Tendon transfer
- Single stage tendon grafting
- 2 stages tendon grafting ± pulley reconstruction

Tenolysis

- Range of active motion is less than passive motion.
- **Timing:** 3-6 months postoperative after plateau of hand therapy.

Tendon transfer

- Transfer of FDS of ring finger to replace FPL for secondary tendon reconstruction either one stage or 2 stages Single

Stage tendon grafting Indications

- Segmental tendon injuries
- Lost or severely damaged segment
- Delayed presentation of zone 2 injury > 6 weeks
- Delayed presentation zone 1 injury with excessive FDP retraction
- Intact pulley system on exploration is a must
- Only FDP is reconstructed
- Controversy: Intact functioning FDS with injured FDP to reconstruct or not?

Two stages tendon reconstruction

Indications

- Extensive soft tissue scarring
- crush injuries or associated previous fractures
- loss of A2 and A4 pulleys that need reconstruction
- Ruptured or failed previous repair

Anesthesia: General or regional by a competent anesthesiologist

Additional measures

- Antibiotics should be used perioperatively with choice of agent as per local guidelines.

Therapy requirements

- Postoperative splinting for 6 weeks
- Access to a competent hand therapist who will provide the support needed for a controlled active motion rehabilitation regime
- The first visit to a therapist after surgery should take place in 3-5 days
- Patients should be offered therapy at weekly intervals for the first 6 weeks at least.
- There should be easy communication and rapid access to the surgical team if the therapist has concerns at any point
- Follow up should continue to a minimum of 12 weeks

Outcomes to be expected

- In the absence of a rupture or infection, the patient should be able to expect a functional range of active motion at 6 months from injury depending on the level of tendon repair and compliance to postoperative hand therapy.
- Complications up to 20% of cases have been reported in the form of wound infection, rupture of repair, postoperative adhesions with functional deficits.
- Redo operation may be needed in cases of tendon rupture either early or late 2 stages tendon reconstruction according to the situation
- Tenolysis may be needed 6 months after repair if there is limitation of active movements with normal passive range of movement.

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Lacerations with extensor tendon involvement

Referral category: The patient should be seen in the next available soft tissue hand clinic (preferably within 24 hours

Consent – principle of shared decision-making

- Discussion with the patient should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes
- The patient's values, occupation and hand function requirements should be discussed and considered in a joint decision making process
- Examples of this:
  - Whether to repair EDM if there is an intact and functioning juncture from EDC to the little finger
  - Simple closed Mallet finger.

Non-operative management options

Where non-operative management is selected the patient should be provided with access to hand therapy to provide splinting where needed, supervision of their progress and assistance with their hand rehabilitation

Operative management requirements Timing

- Within 4 days. Delay may add to difficulty of repair and may end with up tendon rupture.
- Primary repair will be difficult to be done after 2 weeks especially in proximal injuries Zones (zones 6-8) & tendon reconstruction by grafting or transfer may be needed.

Staff

- Done or supervised by a surgeon who is competent in the repair of extensor tendons.

Environment

Equipment

- Extensor tendon repair involves the insertion of foreign material into a relatively poorly vascularized structure. It should therefore be carried out in a designated operating theatre or a procedures room as a minimum for minor repairs.
- Adequate Light.
- Hand surgery instrumentation.
- Appropriate sutures (polypropylene, nylon or Ethibond).
- Tourniquet and the associated infrastructure.
- Loupe magnification.
- Bipolar diathermy with fine tip.

Anesthesia: General or regional by a competent anesthesiologist

Technical details:

<u>Zone I injury (Mallet finger)</u>

- Type I :
  - Immobilization splint in extension or slight hyperextension for 8 weeks, which included 2 weeks night splinting.
  - After 8 weeks the fingers should be examined again and if active extension is present splinting can be reduced to high-risk times such as sleeping, manual work or athletic performance.
  - Alternative for non compliant patient is k wiring of DP and MP with DIP in hyperextension for 6-8 weeks.
- **Type II** requires simple suture through the tendon alone or a roll type suture incorporating the tendon and skin in the same suture and then splinting for 6-8 weeks.
- **Type III** include loss of tendon substance which requires immediate soft tissue coverage and primary grafting or reconstruction with a free tendon graft.
- **Type IV** -A are treated with closed reduction followed by 8 weeks splinting.

- **Type IV** -B is usually treated by splinting for 6 weeks with 2 weeks of night splinting yields good results.
- Type IV-C is surgically managed with open reduction and internal fixation using a Kirschner wire and sometimes a pull-out wire or suture. A splint for 6 weeks is then used after which the Kirschner wire is removed and motion started.
- Zones II –VII: Unlike flexor tendons, due to the size difference and surrounding paratenon deficiency, extensor tendons are not as capable of withstanding multiple-stranded, strong repair approaches especially in the distal zones.
- Zones VII and VIII: 4 strands core sutures repair with running paratenon sutures. For zone VII, release of extensor retinaculum may be needed
- Zone IX: Musculotendinous junction and muscle bellies are repaired with multiple figure of eight sutures.

Additional measures

- Antibiotics should be used perioperatively with choice of agent as per local guidelines.

Therapy requirements

- Postoperative splinting for 6 weeks
- Access to a competent hand therapist who is familiar with the zone specific rehabilitation requirements of these injuries
- Injury specific timeframes

Outcomes to be expected

- Standard outcomes have not yet been delineated. Patients should be given the opportunity to input data at 3 months in order for an outcome standard to be defined in time
- Complications up to 20% of cases have been reported in the form of wound infection, rupture of repair, postoperative adhesions with functional deficits.
- Redo operation may be needed in cases of tendon rupture either early or late tendon reconstruction or transfer according to the situation
- Tenolysis may be needed 6 months after repair if there is limitation of active movements with normal passive range of movement.

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Secondary extensor tendon Reconstruction

Secondary extensor tendon reconstruction is a term used to describe reconstruction of injured extensor tendons that were not repaired in the 1st 4 weeks after trauma. This may be due to

- Late presentation.
- Overlooked injury at the initial presentation or inappropriate surgical situation that made primary repair impossible (e.g., extensive soft tissue and skin insult that needed extensive work for coverage initially).
- Failure of primary repair that may be patient fault (e.g. premature removal of splint), doctor's fault (e.g. poor technique) or physiotherapist fault (e.g. wrong maneuver) or infection.

Referral category: The patient should be seen at the next available soft tissue hand clinic

Consent – principle of shared decision-making

- Discussion with the patient should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes
- The patient's values, occupation and hand function requirements should be discussed and considered in a joint decision making process
- Explanation to the patient that 2 stages procedure may be needed.
- Explanation to the patient the incisions site and the donor tendon graft sites.

Non-operative management options

When non-operative management has been selected, the patient should be given access to a competent hand therapist for supervision of their recovery to a functional range of motion.

Operative management requirements

Timing

Prerequisites

- Supple joints with good passive ROM
- Satisfactory finger circulation
- Soft scars and skin cover
- Cooperative patient

Staff: done or supervised by a surgeon who is competent in secondary tendon repair.

Environment

Equipment

- Tendon repair involves the insertion of foreign material into a relatively poorly vascularized structure and should be carried out in a designated operating theatre
- Adequate Light
- Hand surgery instrumentation
- Appropriate sutures
- Tendon spacer should be standby
    - Tourniquet and the associated infrastructure
    - Loupe magnification
    - Bipolar diathermy with fine tip

Details of tendon reconstruction: one of the following may be used or combination of more than 1 procedure ——— Zone I (Mallet finger):

- For chronic Mallet following closed injury, trial at splinting for 6-8 weeks.
- For chronic Mallet following open injuries or with failed non-operative splinting, removal of attenuated parts of tendon + pinning of DIP for 4-6 weeks followed by dynamic splinting for 6-8 weeks.

- For Swan neck deformity: if without Flexion contracture, splinting will improve it. However, with Flexion contracture, central slip tenotomy + Palmer capsulotomy will be needed.
- For painful, arthritic chronic Mallet that interferes with hand functions, DIP Fusion may be the last resort.

Zone II (Middle Phalanx):

- Chronic Zone II injury usually ends up with Swan neck deformity, do SORL (Spiral Oblique Retinacular Ligament) reconstruction by palmaris longus tendon graft.

Zone III (PIP Joint) "Chronic Boutonnière Deformity":

- **Stage 1:** Supple passively corrected deformity, do Tenotomy.
- **Stage 2:** Fixed contracture due to contracted lateral bands, Tendon grafting is needed + pinning of PIP joint.
- **Stage 3:** Fixed contracture with joint fibrosis, tendon relocation + palmar plate release will be needed.

Zone IV (Thumb metacarpal and finger proximal phalanx):

- It is usually partial injury +/- bone fracture.
- Discrimination could be done only after surgical exploration.
- If there's underlying non-United or mal-united fracture >> correction and pinning are mandatory, then tendon repair using modified Kessler suture + epitendinous cross- stitch.
- For thumb injury in this zone use core suture (Kessler-Tajima).
- Comprehensive PT should be done starting early from first week after surgical repair.

Zone V: (at MP joint). It is famous for "Clench fist injury or fight bites".

- Infection rate is very high with Gr +ve, Gr -ve and anaerobic bacteria.
- Usually, repair should be delayed until subsidence of infection.
- For partial laceration, continue on conservative management and splinting in "safe position".
- For complete tears, repair using core suture + epitendinous repair using Silverskiold technique.
- Sagittal band injury: If more than 2/3 of it is severed, it must be repaired to avoid extensor tendon subluxation.

Zone VI (Finger metacarpal):

- Being tethered by the juncturae so delayed primary repair is quite easy.
- Short segment defects could be grafted using juncturae.
- In cases with extensive adhesions between dorsal skin and underlying metacarpals, a two-stage reconstruction using Silicon rods is recommended.

Zone VII (over the wrist):

- Direct delayed repair in this zone is difficult (absent paratenon, proximal end retract and shorten and scarring of the fibro-osseous compartments).
- **The best management is either by:**
  - Tendon intercalary graft using palmaris longus or toe extensor tendon as onors.
  - **Tendon Transfer**: like transfer of EIP to EPL provides a good solution. Multiple tendon rupture is challenging and may need flexor to extensor transfer.

Zone VIII (Distal forearm):

- This is a rare and difficult situation because the muscle fascia does not hold suture well.
- If presented late, a side-to- side tendon transfer may provide the best option to restore tendon function or tendon transfer from EIP if available.
- Repair in this zone is also difficult as there may be associated nerve injury or muscle debridement may end up with non-repairable muscle gaps.
- Again, tendon transfers will be a good choice.
- Use of palmaris longus tendon for reinforcement of muscle belly repair in a shoelace pattern provides some power to the repair.

Anesthesia: General or regional by a competent anesthesiologist

Additional measures

- Antibiotics should be used perioperatively with choice of agent as per local guidelines.

Therapy requirements

- Postoperative splinting for 6 weeks
- Access to a competent hand therapist who will provide the support needed for a controlled active motion rehabilitation regime
- The first visit to a therapist after surgery should take place in 3-5 days
- Patients should be offered therapy at weekly intervals for the first 6 weeks at least.
- There should be easy communication and rapid access to the surgical team if the therapist has concerns at any point
- Follow up should continue to a minimum of 12 weeks

Outcomes to be expected

- In the absence of a rupture or infection, the patient should be able to expect a functional range of active motion at 6 months from injury depending on the level of tendon repair and compliance to postoperative hand therapy.
- Complications up to 20% of cases have been reported in the form of wound infection, rupture of repair, postoperative adhesions with functional deficits.
- Redo operation may be needed in cases of tendon rupture either early or late 2 stages tendon reconstruction according to the situation
- Tenolysis, capsulotomy, collateral ligament release or even flexor tenolysis may be needed 6 months after repair if there is limitation of active movements with normal passive range of movement.

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Lacerations with nerve involvement

Referral category: The patient should be seen in the next available soft tissue hand clinic, (preferably within 24 hours).

Consent – principle of shared decision-making

- Discussion with the patient should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes
- The need to nerve transfer should be discussed with the patient in certain situations e.g. High ulnar nerve injuries especially in adult patients.
- Combined tendon transfer should be discussed with patient in case of high radial nerve injury.
- The patient's values, occupation and hand function requirements should be discussed and considered in a joint decision making process
- **Examples of this:**
    - Whether to repair a common digital nerve in a patient with little chance of nerve recovery or neuroma formation (i.e. age related poor nerve re- growth) who has significant comorbidities

Non-operative management options

When non-operative management has been selected, the patient should be given access to a competent hand therapist for desensitization therapy and mobilization.

Operative management requirements

Timing

- Within 4 days. Delay may make primary tendon repair difficult and increase the likelihood of nerve grafting

Staff

- Done by a surgeon who is competent in microsurgical nerve repair.

Environment

- Nerve repair be carried out in a designated operating theatre.

Equipment:

- Adequate Light
- Hand surgery instrumentation
- Microsurgery set for nerve repair
- Appropriate sutures
- Tourniquet and the associated infrastructure
- Bipolar diathermy with fine tip
- A microscope or magnifying loupe shouldbe available to the surgeon.

Anesthesia: General or regional by a competent anesthesiologist

Technical aspects:

- Non touch technique with tension free repair
- For end-to-end microsurgical repair, interrupted epinural suture repair is the standard.
- Non absorbable micro sutures, Ethilon, Proline, Nylon
- 8/0 or 9/0 for large nerves. 9/0 or 10/0 for digital nerves
- Fibrin glue can be used

Additional measures

- Antibiotics should be used perioperatively with choice of agent as per local guidelines.
- The use of pharmacological agents to reduce nerve pain should be considered, and where appropriate started early

Therapy requirements

- Postoperative hand splinting for 4 weeks.
- Access to a competent hand therapist who will provide an extended period of support and advice on desensitization, sensory re-education , electrical stimulation and strengthening exercise with maintenance of passive ROM where motor nerves are involved
- The first visit to a therapist after surgery should take place in 5-7 days if the condition of the wound allows that, otherwise to be delayed.

Outcomes to be expected

- The range of injuries is too great to have a meaningful outcome expectation for all nerve injuries.
- It is imperative to stress to adult patients with high nerve injury that they have suffered a severe injury and will never regain normal hand sensation, strength, or function. They should be aware that the aim of all surgery is to create the best possible "helper hand" and that it will always have rudimentary function compared with the normal hand. Tendon transfers can restore selected motor functions after high and low nerve palsy, but their ability to improve function is restricted by the severity of any associated sensory loss.
- Recovery of function depends on the level of nerve injury, age of the patient, timing of repair, general condition of the patient and the nerve repaired.
- Rupture of nerve repair has been reported in minority of cases that may necessitate redo operation with possibility of need to nerve grafting.
- Neuroma formation with revision surgery has been reported in minority of cases.
- Incomplete functional recovery is common in high nerve injuries and occasional in low-level injuries.
- Recovery of small muscles of the hand may be incomplete in low-level injuries and may not recover entirely in high ulnar and median nerve injuries.
- Need to muscle or tendon transfer may be needed late especially in high-level nerve injury and in the occasional non-recovered low-level injury.

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Secondary nerve repair

If the nerve repair is performed after 2 weeks from trauma, the end-to-end nerve repair becomes more and more difficult and there is a high possibility for nerve grafting or nerve transfer. This is the secondary nerve repair

Referral Category: The patient may present to soft tissue hand clinic.

Consent – principle of shared decision making

- Discussion with the patient should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes
- The patient's values, occupation and upper limb function requirements should be discussed and considered in a joint decision making process
- **Examples of this:**
  - Priorities need to be identified and matched with available resources in each patient. Finally, counseling patients toward realistic expectations is a critical component of preparation for surgery.
  - The explanation of the need of nerve grafting from the sural nerves and in incisions in the calf should be explained to the patient.
  - Nerve transfer may be another option and the donor site should be explained to the patient as well as its incisions and drawbacks.
  - Counseling patients toward realistic expectations is a critical component of preparation for surgery. The need for long preoperative and postoperative rehabilitation program should be explained to the patient.

Non-operative management options

- The patient should be given access to a competent hand therapist for mobilization of all joints of affected upper limb, and care of all muscles of this limb.
- In elderly patients, or patients with comorbidity, no- operative treatment may be needed and this has to be discussed with patient.

Assessment:

- Clinical (Mainly)
- Electrophysiological studies
- Routine lab.

Operative management requirements

Timing

- According to the type of nerve injury and possibility of adding function, secondary procedures can be tailored and the choice of the best available unit of transfer.
- When there is good skin cover and the tissues are supple, surgical interference should be done better with the 1st 3 months after trauma.
- Surgery after 1 year has the worst prognosis

Staff

These surgeries to be done by a surgeon who is competent in microsurgical peripheral nerve surgeries and tendon transfer.

Environment

- Secondary nerve surgery repair be carried out in a designated operating theatre

Equipment:

- Adequate Light
- Hand surgery instrumentation
- Microsurgery set for nerve repair
- Nerve stimulator may be needed in some cases.
- Appropriate sutures
- Fibrin glue
- Tourniquet and the associated infrastructure

- Bipolar diathermy with fine tip
- A microscope or magnifying loupe shouldbe available to the surgeon.

Anesthesia: General or regional

Technical aspects:

- Non touch technique with tension free repair
- For microsurgical repair, interrupted epinural suture repair is the standard.
- Non absorbable micro sutures, Ethilon, Proline, Nylon
- 8/0 or 9/0 for large nerves. 9/0 or 10/0 for digital nerves
- Fibrin glue can be used
- Nerve grafting is the standard technique.
- Nerve transfer can be used if there is expected extensive scarring in the bed, old high nerve injuries or there is risk of exploration of the site of trauma e.g. previously repaired injured vessels

Additional measures

- The use of pharmacological agents to reduce nerve pain should be considered, and where appropriate started early
- Perioperative antibiotics

Therapy requirements

- Postoperative hand splinting for 4weeks.
- Access to a competent hand therapist who will provide an extended period of support and advice on desensitization, sensory re-education and maintenance of passive ROM where motor nerves are involved and prolonged rehabilitation programs.
- The first visit to a therapist after surgery should take place in 5-7 days, before adhesions become established

Outcomes to be expected

- The range of injuries is too great to have a meaningful outcome expectation for all nerve injuries.
- It is imperative to stress to adult patients with high nerve injury that they have suffered a severe injury and will never regain normal hand sensation, strength, or function. They should be aware that the aim of all surgery is to create the best possible "helper hand" and that it will always have rudimentary function compared with the normal hand. Tendon transfers can restore selected motor functions after high and low nerve palsy, but their ability to improve function is restricted by the severity of any associated sensory loss.
- Recovery of function depends on the level of nerve injury, age of the patient, timing of repair, general condition of the patient and the nerve repaired.
- Rupture of nerve repair has been reported in minority of cases that may necessitate redo operation with possibility of need to nerve grafting.
- Neuroma formation with revision surgery has been reported in minority of cases.
- Incomplete functional recovery is common in high nerve injuries and occasional in low-level injuries.
- Recovery of small muscles of the hand may be incomplete in low-level injuries and may not recover entirely in high ulnar and median nerve injuries.
- Need to muscle or tendon transfer may be needed late especially in high-level nerve injury and in the occasional non-recovered low-level injury.

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Cut wrist

A term used to describe injuries affecting the volar aspect of the wrist and distal forearm

- **Minimum definition**: Injury of at least of 3 structures completely transected including one major vessel or nerve.
- **High definition**: involvement to at least 10 divided structures inclusive of both ulnar and median nerves and ulnar and radial arteries.

Initial assessment:

- Vascularity of the hand fingers. Immediate referral and urgent surgical interference if there is active bleeding that does not stop by conservative measures or there is manifestations of ischemia of hand and fingers.
- Clinical and motor and sensory assessment of the median ulnar nerves
- Clinical assessment of the FDS and FDP tendons of all fingers as well as FPL, FCU and FCR tendons.
- Assessment of the skin condition
- Radiological evaluation for fractures or foreign bodies according to the cause of injury

Referral category: The patient should be seen at the next available soft tissue hand clinic. Immediate referral if there is manifestation of acute ischemia or active bleeding that did not stop with conservative measures, otherwise the patient can be referred within 24 hours.

Consent – principle of shared decision-making

- Discussion with the patient should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes.
- The patient's values, occupation and hand function requirements should be discussed and considered in a joint decision making process.

Operative management requirements Timing

- Within 24 hours if there is arterial injuries
- Within 4 days if there is no arterial injuries. Delay may add to difficulty of repair and may end with up tendon rupture or nerve rupture in addition to tissue edema and difficulty in skin closure.
- Primary repair will be difficult to be done after 10 days

Staff

- Done or supervised by a surgeon who is competent in tendon surgery with microsurgical expertise.

Environment

Equipment

- Repair of cut wrist involves the insertion of foreign material into a relatively poorly vascularized structure and should be carried out in a designated operating theatre
- Adequate Light
- Hand surgery instrumentation
- Microsurgery set for arterial and nerve repair
- Appropriate sutures
- Tourniquet and the associated infrastructure
- Loupe magnification
- Bipolar diathermy with fine tip

Anesthesia: General or regional by a competent anesthesiologist

Additional measures

- Antibiotics should be used preoperatively with choice of agent as per local guidelines.
- Blood transfusion may be needed
- Intra and postoperative anticoagulants may be needed

Technical aspects

- Lavage: remove all blood clots, foreign bodies
- Debridement of skin and devitalized structures
- The wound is extended obliquely proximally and distally to ensure full exposure of the structures.
- The carpal tunnel may be released.
- All structures are identified using non-touch technique and repaired sequentially from deep to superficial.
- Early arterial repair may be needed if there is ischemia.
- Microsurgical techniques are used for repair of injuries radial and or ulnar arteries as well as median and or ulnar nerves
- A suitable core suture should be selected for the size of the tendon a minimum 4 strand configuration with at least a 3.0 caliber suture

Therapy requirements

- Postoperative splinting for 6 weeks.
- Access to a competent hand therapist who will provide the support needed for a controlled active motion rehabilitation regime.
- The first visit to a therapist after surgery should take place in 3-5 days.
- Patients should be offered therapy at weekly intervals for the first 6 weeks at least.
- There should be easy communication and rapid access to the surgical team if the therapist has concerns at any point
- Follow up should continue to a minimum of 12 weeks.

Outcomes to be expected

- In the absence of a rupture or infection, the patient should be able to expect a functional range of active motion at 3 months from injury depending on the level of tendon injury, associated injuries and patient compliance to postoperative hand therapy.
- Complications up to 20% of cases have been reported in the form of wound infection, rupture of repair, postoperative adhesions with functional deficits.
- Early redo operation may be needed for arterial repair
- Side neuroma or rupture of repair of median and ulnar repairs have been reported and my need revision with the possibility of nerve grafting within 6 months after operation.
- Tenolysis may be needed 6 months after repair if there is limitation of active movements with normal passive range of movement.

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Closed Hand Fractures

Referral category: next available clinic within 72 hours

Consent – principle of shared decision-making

- Discussion with the patient should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes
- The patient's values, occupation and hand function requirements should be discussed and considered in a joint decision making process
- Examples of this:
  - Whether to amputate, fuse or salvage a comminuted joint fracture.

Non-operative management options

- Non-operative management is appropriate for most closed fractures in the hand. Plaster technicians competent to provide hand splints or immediate referral to hand therapy should be available.
- Where this option is selected, the patient should have a clear follow up plan with early referral to hand therapy for supervision of their fracture management and assistance in regaining their range of motion.

Operative management requirements

Timing

- Within 7 days of injurywhen fixation is the firstchoice
- Within 72 hours of the decision to operate where conservative management has failed.

Staff

- Done or supervised by a surgeon who is competent in the fixation of hand fractures

Environment

- Fracture fixation involves the insertion of metalwork into bone. It should therefore be carried out in a designated operating theatre with the appropriate number of air changes

Equipment

- Light
- Hand surgery instrumentation
- Appropriate fracture fixation equipment and implants
- Intra-operative mini C arm X-ray facilities with the capability of images storing for later reference
- When needed, tourniquet and the associated infrastructure

Additional measures e.g. antibiotics

Antibiotics should be given pre-operatively or intra-operatively when metalwork is inserted.

Therapy requirements post-operatively

- Access to a competent hand therapist who will provide support and instruction to regain range of motion at the appropriate speed.
- Early mobilization should be the default plan and instructions for early mobilization of the fracture should be given to the patient pre-operatively so that they can start moving whilst waiting for their first therapy appointment after surgery.
- The first visit to a therapist should take place 5-7 days after surgery, before adhesions become established, unless otherwise specifically advised by the surgeon
- The therapist should have an easy route of communication with and rapic access to the surgical team

Expected outcomes

- Hand fractures are common and can result in significant pain and disability if not treated well.
- The potential outcome is predicated by the original injury but the aim is to achieve infection free union with good soft tissue coverage and a functional range of motion.

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Open hand fractures

Referral category – The patient should be referred for same day review, potentially for admission to facilitate elevation and antibiotics whilst waiting for surgery

Consent – principle of shared decision-making

- Discussion with the patient should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes
- The patient's values, occupation and hand function requirements should be discussed and considered in a joint decision making process
- **Examples of this:**
- Whether to amputate or repair a severely crushed open digit

Pain management

- Appropriate measures should be taken to control pain, from the point of presentation through to rehabilitation.

Non-operative management options

An entirely non-operative approach would rarely be advised, although minimal procedures might include wound washout and closure with splinting of the fracture. Where this option is selected, the patient should have a clear follow up plan and access to hand therapy for supervision of their fracture management and rehabilitation.

Operative management requirements for fracture fixation

Timing

- Within 24 hours – if definitive procedure not possible within this time a washout and closure should be done within this timeframe

Staff

- Done or supervised by a surgeon who is competent in the fixation of hand fractures

Environment

- Fracture fixation involves the insertion of metalwork into bone. It should therefore be carried out in a designated operating theatre or a procedures room as a minimum when simple washout and closure only is required

Equipment

- Adequate Light
- Hand surgery instrumentation
- Appropriate fracture fixation equipment
- Intra-operative mini C arm X-Ray facilities with the capability of storing images for later reference
- Tourniquet and the associated infrastructure

Additional measures e.g. antibiotics

- Antibiotics should be stopped at 72 hours or after definitive closure whichever is the sooner, subject to clinical judgement.

Post-Operative Care

- Hand elevation
- Patients should be given explicit instructions after care until their follow up

Therapy requirements post-op

- Access to a competent hand therapist who will provide support and instruction to regain range of motion at the appropriate speed
- Where appropriate, instructions for early mobilization of the fracture should be given to the patient pre-operatively so that they can start moving whilst waiting for their first therapy appointment after surgery.
- The first visit to a therapist should take place 5-7 days after surgery, before adhesions become established, unless otherwise specifically advised by the surgeon
- The therapist should have an easy route of communication with and rapid access to the surgical team

Outcomes to be expected

The outcome is largely predicted by the original injury but the aim is to achieve

- Infection free union
- Good soft tissue cover
- A functional range of motion

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Obstetrical brachial plexus injuries

The birth injuries of the brachial plexus (OBPP) differ in a lot of views from traumatic brachial plexus injuries. The usual concept for parents of a baby with (OBPP), is expecting spontaneous recovery. The complexity and rigor of these procedures for both the reconstructive team and patient are substantial. Successful outcomes require not only consideration of the nature of the plexus injury (including location, mechanism, and elapsed time from injury) and presence of associated injuries but also surgical expertise, practical operative time constraints, and ability to provide and attend prolonged postoperative rehabilitation.

Referral Category:

The patient may present to brachial plexus surgeon in causality or in soft tissue hand clinic (preferably within first two weeks after injury).

Early referral from obstetricians, pediatricians and physical specialists is crucial to put an effective plan for management.

Consent – principle of shared decision-making

- Discussion with the parents should include all options, an outline of patients rehabilitation requirements for each option, and the likely outcomes
- **Examples of this:**
  - Priorities need to be identified and matched with available resources in each patient.
  - Counseling parents toward realistic expectations is a critical component of preparation for surgery. The need for long preoperative and postoperative rehabilitation program until adulthood should be explained to parents.
  - Explanation of the parents that the incision sites will be in the neck and may be in the chest and upper arm according the exploration outcomes.
  - The need for sural nerve grafts with incisions in both calves should be explained to the parents.

Non-operative management options

The patient should be given access to a competent hand therapist for mobilization of all joints of affected upper limb, and care of all muscles of this limb.

Assessment:

- Clinical (Mainly)
- Radiological (MRI cervical spine). Just to see if there is root avulsion or not.
- Chest X-ray to see the diaphragm if the is phrenic nerve affection and fracture clavicle.
- Electrophysiological studies
- Routine lab.

Operative management requirements

Timing

- There is ongoing debate about the timing of microsurgical intervention, for OBPP.
- The absolute indication for early surgical exploration and microsurgical neural reconstruction is the presence of total plexopathy with Horner' sign usually at the age of 3 months or any level with radiological evidence of root avulsion
- The most common criterion used in clinical practice as an indication for microsurgical neural reconstruction is the absence of return of biceps muscle function associated with total plexopathy without Horner's sign at 3 months or an upper trunk lesion at 5 to 6 months.

Reconstruction is performed between 3 and 9 months of age at various centers, and the repairs cited have been reported to be performed from 1 to 24 months of age but with weak evidence base.

Staff

Done by a surgeon who is competent in microsurgical brachial plexus exploration and repair

Environment

- Brachial plexus repair be carried out in a designated operating theatre

Equipment:

- Adequate Light
- Nerve stimulator
- Hand surgery instrumentation
- Microsurgery set for nerve repair
- Appropriate sutures
- Fibrin glue
- Tourniquet and the associated infrastructure
- Bipolar diathermy with fine tip
- A microscope or magnifying loupe shouldbe available to the surgeon.

Anesthesia: General anesthesia with the probability of need for postoperative ICU. Technical aspects and ntraoperative decision-making

- The traditional nerve surgery of obstetrical brachial plexus includes neurolysis, nerve grafting and nerve transfer.
- The intraoperative procedure depends on the preoperative clinical, radiological electrophysiological findings and the available healthy roots.
- Fibrin glue is usually used for repair

Additional measures: perioperative antibiotic and no muscle relaxant anesthesia

Therapy requirements

- Special postoperative head, neck and upper splinting for 3-4 weeks.
- Access to a competent hand therapist who will provide an extended period of rehabilitation programs.
- The first visit to a therapist after surgery should take place in 4 weeks after surgery

Outcomes to be expected

- Mortality has been rarely reported being a major surgery in an infant.
- The range of injuries is too great to have a meaningful outcome expectation for all brachial plexus injuries
- The results are expected to start to appear 6 months after surgery.
- There is no guarantee for complete recovery in upper plexus injuries.
- Incomplete recovery is common
- The need for further operations may be decided later on in the form of muscle or tendon transfers or osteotomies.
- Long-term follow up until adulthood is recommended to modulate the postoperative rehabilitation program to interfere surgically in the proper time.
- In most cases, the patient will be never normal with various degrees.
- Total plexopathy results after surgery are worse than upper plexus palsy.
- Delay for surgery after 1 year has bad results.

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Traumatic Brachial plexus injuries

The loss of upper extremity function following a traumatic brachial plexus injury causes devastating functional deficits that require complex surgical reconstruction. The complexity and rigor of these procedures for both the reconstructive team and patient are substantial. Successful outcomes require not only consideration of the nature of the plexus injury (including location, mechanism, and elapsed time from injury) and presence of associated injuries but also surgical expertise, practical operative time constraints, and ability to provide and attend prolonged postoperative rehabilitation.

Referral Category: the patient may present to brachial plexus surgeon in causality or in soft tissue hand clinic (preferably within first two weeks after injury).

Consent – principle of shared decision making

- Discussion with the patient should include all options, an outline of patients rehabilitation requirements for each option, and the likely outcomes
- **Examples of this:**
  - Priorities need to be identified and matched with available resources in each patient.
  - Counseling patients toward realistic expectations is a critical component of preparation for surgery. The need for long preoperative and postoperative rehabilitation program should be explained to the patient.
  - Explanation of the patient that the incision sites will be in the neck and may be in the chest and upper arm according the exploration outcomes.
  - The need for sural nerve grafts with incisions in both calves should be explained to the parents.

Assessment:

- Clinical (Mainly)
- Radiological (MRI cervical spine). Just to see if there is root avulsion or not.
- Chest X ray to see the diaphragm if the is phrenic nerve affection and fracture clavicle.
- Electrophysiological studies
- Routine lab.

Non-operative management options

- The patient should be given access to a competent hand therapist for mobilization of all joints of affected upper limb, and care of all muscles of this limb.
- In elderly patients, or patients with comorbidity, no- operative treatment may be needed and this has to be discussed with patient.

Operative management requirements

Timing

- According to the type of traumatic brachial plexus injury, and associated lesions in the vessels or bone and shoulder joint.
- Indications for acute exploration include
  - Concomitant vascular injury, open injuries caused by sharp laceration.
  - Plexus injuries that occur from a low-energy GSW are generally neuropraxic and should not be routinely explored. Delayed exploration (3 months after the initial injury) is recommended for gunshot injuries with no recovery by clinical examination or electromyography (EMG) at 12 weeks post injury.
- Closed posttraumatic brachial plexus injuries:

- Absolute indication of early surgery 2-3 months after trauma is the presence of total brachial plexus or low brachial plexus injuries c8, T1with Horner's sign
- In total brachial plexus palsy without Horner's sign wait for 3 months for spontaneous recovery. If no recovery starts to appear, surgery is indicated between 3-6 months.
- For upper brachial plexus palsy, wait for 3 months, if there is no biceps recovery, surgery is indicated at 3-6 months after trauma.
- Delayed cases after 1 year from trauma have very poor outcome after surgery.

Staff

Done by a surgeon who is competent in microsurgical brachial plexus exploration and repair.

Environment

- Brachial plexus repair be carried out in a designated operating theatre.

Equipment:

- Adequate Light
- Nerve stimulator
- Hand surgery instrumentation
- Microsurgery set for nerve repair
- Appropriate sutures
- Fibrin glue
- Tourniquet and the associated infrastructure
- Bipolar diathermy with fine tip
- A microscope or magnifying loupe shouldbe available to the surgeon.

Anesthesia: General anesthesia with the probability of need for postoperative ICU.

Additional measures

- The use of pharmacological agents to reduce nerve pain should be considered, and where appropriate started early
- Perioperative antibiotics

Technical details and intraoperative decision-making.

- The traditional nerve surgery of brachial plexus includes neurolysis, nerve grafting and nerve transfer with more and more nerve transfers in the last 10 years.
- The intraoperative procedure depends on the preoperative clinical, radiological electrophysiological findings and the available healthy roots.
- This alghorithem is just a guide for intraoperative decision- making. Many other options are reported in the literature. All of them have their rational

C5, 6 palsy: single or 2 operative sessions

1. Neurtotization of supra and infraspinatus muscles by nerve transfer of spinal accessory nerve to suprascapular nerve by anterior or posterior approach
2. Neurotiztion of deltoid muscle by transfer of nerve to long head of transfer to axillary nerve.
3. Neurotization of elbow flexors either by single or double neurotzation by an expandable fascicle rom median and or ulnar nerves to nerve of bicpes brachii alone or with brachialis muscle.

C5, 6, 7 palsy: single or 2 operative sessions

1. Neurtotization of supra and infraspinatus muscles by nerve transfer of spinal accessory nerve to suprascapular nerve by anterior or posterior approach
2. Neurotiztion of deltoid muscle by transfer of nerve to long head of transfer to axillary nerve
3. Neurotization of biceps brachii by an expandable fascicle rom ulnar nerves to nerve
4. Neurotization of long head of triceps by an expandable motor fascicle from the median nerve
5. Either by neurotization of the posterior interosseous from on of nerves of superficialis muscles and or later tendon transfers.

Total palsy:

- Priority is for supraspinatus, infraspinatus, biceps and median nerve.
- Donors usually combination of spinal accessory nerve, 2,3,4 anterior intercostal nerves with or without contralateral c7 with reversed ulnar nerve interposition.

Therapy requirements

- Postoperative hand splinting for 3-4 weeks.
- Access to a competent hand therapist who will provide an extended period of support and advice on desensitization, sensory re-education and maintenance of passive ROM where motor nerves are involved & extended periods of rehabilitation program.
- The first visit to a therapist after surgery should take place in 3-4 weeks after surgery.

Outcomes to be expected

- Mortality has been rarely reported being a major surgery.
- The range of injuries is too great to have a meaningful outcome expectation for all brachial plexus injuries
- The results are expected to start to appear 6 months after surgery. No more improvement is expected 3 years after surgery.
- There is no guarantee for complete recovery even in upper plexus injuries.
- Incomplete recovery is common
- The need for further operations may be decided later on in the form of muscle or tendon transfers, arthrodesis , osteotomies or cobinations.
- Long-term follow is recommended to modulate the postoperative rehabilitation program to interfere surgically in the proper time.
- In most cases, the patient will be never normal with various degrees.
- Total plexopathy results after surgery are worse than upper plexus palsy.
- Delay for surgery after 1 year has bad results.
- Recovery of hand function is usually equivocal in total and low plexopathy. No or partial recovery is usual

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Tendon and muscle transfer

Definition: relocation of the insertion of a functioning muscle-tendon unit (MTU) to restore lost movement and function at another site.

Referral Category: The patient may present to soft tissue hand clinic, Consent – principle of shared decision making

- Discussion with the patient should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes
- The patient's values, occupation and upper limb function requirements should be discussed and considered in a joint decision making process
- **Examples of this:**
  - Priorities need to be identified and matched with available resources in each patient. Finally, counseling patients toward realistic expectations is a critical component of preparation for surgery.
  - The explanation of site of incisions.
  - Counseling patients toward realistic expectations is a critical component of preparation for surgery. The need for long preoperative and postoperative rehabilitation program should be explained to the patient.

Preoperative management options

- The patient should be given access to a competent hand therapist for mobilization of all joints of affected upper limb, and care of all muscles of this limb. The aim is to reach supple joints and powerful donor muscles.

Timing and most common indications

Lost function (movement) of a muscle or group of muscles

1- Peripheral nerve injury that has no potential to improve. a. root avulsions
   b. No recovery after direct nerve repair, grafting, or transfers guided by clinical and electrophysiological assessment
   c. Late presentation, muscle re-innervation is impossible due to motor end-plate fibrosis.
2- Nerve repair with early transfer as internal splint (optional)(Example: radial nerve palsy) (early transfer)
   a. Substitute during nerve regeneration
   b. Helper by adding power to innervated muscle
   c. Act as substitute when nerve regeneration is poor
3- Organic loss of MTU (can be done immediate or late according to the situation (optional))
   - Trauma
   - After malignancy excision

Contraindications:

Absolute contraindication to tendon transfer: lack of appropriate donors.
Relative contraindications:

- When the only available muscle are muscle-tendon units with less than grade 5 strength
- If only muscles that have been denervated and then reinnervated are available
- Transfers planned in individuals with progressive neuromuscular diseases should be carefully considered before proceeding because the underlying disease process may affect the transferred unit.

Preoperative prerequisites

- Supple joints prior to transfer and Stable skeleton. Satisfactory results are difficult to achieve in less supple joints
- Soft tissue equilibrium (no edema, scarring, contracture)
- Sensate hand

Choice of the donor unit:

- Donor of adequate excursion
- Donor of adequate strength. MTU to be transferred must be strong enough to achieve the desired movement (G5), but at the same time, should not be too strong.
- Expendable donor. Another remaining muscle can continue to adequately perform the transferred MTU's original function.
- If possible donor to be synergistic

Strategy of choice:

1. List available functioning muscles
2. List which of those muscles are expendable
3. List hand functions requiring restoration
4. Match #2 and #3
5. Single function per transfer

Staff

These surgeries to be done by a surgeon who is competent in surgery of tendon transfer.

Environment

- Well -designated operating theatre

Equipment:

- Adequate Light
- Hand surgery instrumentation
- Appropriate sutures
- Tourniquet and the associated infrastructure
- Bipolar diathermy with fine tip

Anesthesia: General or regional

Technical aspects:

- Whenever possible incisions should not cross the path of the transferred tendon
- Avoid interference with normal structures
- Reverse order, prepare recipient site and tunnel before raising muscle
- Whenever possible, tendon should cross the joint of motion at 90° to maximize power and excursion.
- Wide tunnel of tendon path
- Tension should be set to produce the necessary joint movement with maximal muscle contraction.
- Some initial over correction should be planned, as some tendon stretch is usual.
- Joint should be initially immobilized in a position that relieves tension at the insertion of the transfer

Additional measures

- The use of pharmacological agents to reduce nerve pain should be considered, and where appropriate started early
- Perioperative antibiotics

Therapy requirements

- Postoperative hand splinting for 6 weeks.
- Access to a competent hand therapist who will provide an extended period of rehabilitation
- The first visit to a therapist after surgery should take place in 5-7 days, before adhesions become established

Outcomes to be expected

- It is imperative to stress to adult patients that they should be aware that the aim of all surgery is to create the best possible "helper hand" and that it will always have rudimentary function compared with the normal hand.
- In the absence of a rupture or infection, the patient should be able to expect a functional range of active motion at 6 months from time of surgery depending on the compliance to postoperative hand therapy.
- Complications up to 20% of cases have been reported in the form of wound infection, rupture of repair, postoperative adhesions with functional deficits.
- Redo operation may be needed in cases of tendon rupture either early or late 2 stages tendon reconstruction according to the situation
- Tenolysis may be needed 6 months after repair if there is limitation of active movements with normal passive range of movement.

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Acutely burnt hand

The management galls of acutely burnt hand are:

1. Avoid further injury.
2. Achieve early wound closure
3. Maintain full range of motion
4. Guard against infection
5. Functional rehabilitation

Referral category:

First Aid

Immediate cooling of the hand by applying running cold tap water helps greatly with decreasing the edema and may help with decreasing the amount of energy delivered to the tissues as well as help with pain. Ice packs or cold compresses may actually do more harm to the tissues. Hand elevation is important. Then, the patient should be seen at the next available burn unit as emergency.

In the Casualty department

Evaluation

1. Decide about the depth and extent of the burn and if it is part of a major insult or a solitary problem
2. Comprehensive history is mandatory in diagnosis as well as the outcome
3. Careful examination of the patient including other injuries and comorbidities should be performed
4. Documentation of all the data from history and physical examination and including photography is ntegral or both the management as well as medicolegal purposes.
5. Perfusion state of the hand/ fingers should be assessed to facilitate the decision of escharotomy, fasciotomy or compartment release

Consent – principle of shared decision-making

- Discussion with the patient should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes
- The patient's values, occupation and hand function requirements should be discussed and considered in a joint decision making process

Staff:

- A plastic surgeon competent in management of burns
- Nursing staff with good experience in burn management
- Splint marker
- Hand therapist if available, otherwise, the surgeon and assistant nursing staff can do the job.

Non-operative management options (just dressing)

When non-operative management has been selected, the patient should be given access to a competent hand therapist for supervision of their recovery to a functional range of motion

Management principles

1. Evaluate the burn
2. Prevent vascular compromise by escharotomy or fasciotomy as indicated
3. Local wound care
4. Decide about conservative or surgical intervention
5. Early hand therapy and splinting
6. Surgical intervention when decided upon
7. Postoperative care
8. Functional rehabilitation
9. Secondary or tertiary procedures along the course

Emergent escharotomy is indicated in deep circumferential burns with tense tissues and vascular compromise

- Timing: Pain, resistance to passive extension of fingers and disappearance of capillary refilling at nail beds are the main indicators. Once present escharotomy should be done immediately.

Technical tips:

- It should release all tension with return of the vascularity. It extends as needed from shoulder tip to the fingers and goes down until the eschar is released completely. It should be put in a line that does not endanger important structures underneath.
- Fasciotomy of the interossei by small vertical incisions dorsally between the metacarpals is indicated in severe edema and diminished finger flexion
- Intrinsic muscle decompression by combining fasciotomy and escharotomy and release at the forearm level is indicated if the hand takes intrinsic minus position (finger hyperextension at MP joint with flexion at IP joints).

Splinting: in all deep burns

- Early splinting and positioning is crucial to prevent intrinsic minus position which is a major complication and is seen in neglected burns frequently and is very difficult to manage later
- Wrist flexion, hyperextension at MP joints and flexion at all IP joints with the thumb adducted and the IP joint extended is the classical neglected hand. With edema fibrosis and scarring with immobility will result in this clawing hand which is difficult to function and to Reconstruct
- With proper splint in the anti-claw or the intrinsic plus position which involves putting the wrist at 35 -45 degrees extension , MP 80 - 90 degrees flexion and fingers nearly fully extended and the thumb abducted and extended will put the ligaments in its best tension.
- Thermoplastic splints will help in adjusting the splint in the best recommended position and should be applied in the first day
- Early mobilization is encouraged

Local wound care

- Superficial and superficial dermal burns are expected to heal spontaneously within 7 – 14 days with moist clean environment
- Debridement and cleaning of all contaminants is done
- Blisters are still a controversial in management, small blisters about 1 cm are to be left but larger blisters contained fluid is rich in pro inflammatory mediators that may propagate the wound injury and increase the zone of stasis so aspiration or drainage leaving the blister skin as a biological dressing or de roofing and managing the wound surface directly.
- Daily or every 2 or 3 days cleaning and debridement and washed with filtered tap water or normal saline the application of antiseptic cream, a deeper burn may require more penetrating cream as silver sulphadiazine.

- Once epithelialization starts frequency of dressing is reduced to care for the newly formed epithelium
- Palm skin in general heals spontaneously with the abundancy of skin appendages in this glabrous skin

Environment

- Dressing is done in the office or dressing room under aseptic conditions with sterile gloves and dressings.

Surgery to the burned hand

- In the case deep burns, early excision and grafting is the main method of management unless the general condition reclude this option. The other option is dressing and delayed grafting 3 weeks after burn.
- It is done between day 1 to day 5 where the local wound is favorable in context of infection and edema
- Palmar skin should be given a chance for spontaneous healing unless clear full thickness burns is obvious
- Excision is done in tangential manner until punctate bleeding appears making sure no left over avascular tissues
- Care to leave the paratenon intact to guarantee graft take
- Partial thickness skin graft as a sheet if there is enough donor available is the rule, meshed graft may be used if no enough donor area is available as the cosmetic result together with tendency

to contract are disadvantage to its use

- Bolus tie over with enough pressure to conform the graft bed
- Make sure that the finger tips are seen for follow up
- Hand elevation with splinting is mandatory
- Graft should be inspected in 5-7 days' time and any nonviable skin is debrided and mobilization should start by then
- Odorous or breakthrough dressing should be inspected early to salvage the graft from infection or bleeding
- In very deep burns that go beyond tendons flap covering may be indicated and flap choice depends on availability & local and general condition
- Use of dermal substitutes if available may help in cases of deep burns requiring sub facial excision to help with type of scar resulting from this aggressive excision procedure
- In all cases we need to stress on the importance of physical therapy, early mobilization, hand splinting and elevation

Environment: Designated operating theatre

Equipment

- Adequate Light
- Instrumentation and dressing material for skin grafting and tangential excision
- Appropriate sutures
- Tourniquet and the associated infrastructure
- Bipolar diathermy with fine tip

Anesthesia: General by a competent anesthesiologist

Additional measures

- Antibiotics should be used preoperatively with choice of agent as per local guidelines.
- Postoperative pain control
- Blood or plasma transfusion may be needed.

Therapy requirements

- Postoperative splinting
- The first visit to a therapist after surgery should take place after making sure of graft take and complete healing
- There should be easy communication and rapid access to the surgical team if the therapist has concerns at any point
- Long follow up

Outcomes to be expected

- Depends largely on depth of burn
- In superficial burns, healing occurs within 2 weeks. Early discoloration is expected, that improves by time. No functional deficits.
- In deep secondary degree burns, hyper or hypopigmentation may occur. Hypertrophic scar may occur that will need treatment
- For deep burns that will need grafting, skin quality of the graft is totally different from normal skin regarding color and texture. The patient should be informed about this.
- Hypertrophic scars for donor and recipient sites may occur that will need treatment
- For deep circumferential burns especially who presented late, loss of parts of the extremity may occur.
- For cases of deep burns that present late, functional deficits may occur.
- Secondary surgery may be needed later on for residual deformities.
- Long follow up is mandatory.

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Carpal tunnel syndrome

Carpal tunnel syndrome is common, and mild acute symptoms usually get better with time, splinting at night, pain relief and corticosteroid injection should be considered. Surgery should be considered for persistent severe symptoms.

Referral Category: The patient may present to soft tissue hand clinic.

Consent – principle of shared decision-making

- Discussion with the patient should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes
- The patient's values, occupation and upper limb function requirements should be discussed and considered in a joint decision making process

Diagnostic guidelines: mainly clinical

- **Diagnostic criteria**
  - Numbness and tingling in the median nerve distribution
  - Nocturnal numbness
  - Weakness and/or atrophy of the thenar musculature
  - Positive Tinel sign
  - Positive Phalen test
  - Loss of two-point discrimination
  - Thenar atrophy
  - EMG and NCV findings of median nerve entrapment
- Negative radiological skeletal findings.
- Superficial probe ultrasonography may be helpful.

Differential diagnosis

- AIN compressive neuropathy
- Pronator syndrome
- Ulnar tunnel syndrome
- Cervical radiculopathy

Recommended Guidelines of treatment:

Non-Operative treatment: first line of treatment modalities

Timing and indications

- Mild cases with intermittent symptoms causing little or no interference with sleep or activities require no treatment
- Cases with intermittent symptoms which interfere with activities or sleep should first be treated with:
  - NSAID
  - night splints (good for patients with nocturnal symptoms only)
  - activity modification (avoid aggravating activity)
  - steroid injections

Operative treatment

Timing and indications

- Failure of non-perative treatment (including steroid injections)
- There is either: a permanent reduction in sensation in the median nerve distribution; or muscle wasting or weakness of thenar abduction.
- Acute CTS following ORIF of a distal radius fx.

Revision CTR for incomplete release
Indications

- Failure to improve 6-12 months following primary surgery

Staff

These surgeries to be done by a surgeon who is competent in nerve and tendon entrapment surgery.

Environment

Ordinary operating theatre

Equipment:

- Adequate Light
- Hand surgery instrumentation
- Appropriate sutures
- Tourniquet and the associated infrastructure
- Bipolar diathermy with fine tip
- Magnifying loupe

Anesthesia: Usually local or regional. General for non-cooperative patient.

Technical aspects:

- Open carpal tunnel release
- Endoscopic carpal tunnel release

Additional measures

- The use of pharmacological agents to reduce nerve pain should be considered, and where appropriate started early
- Perioperative antibiotics

Postoperative therapy requirements

- Early use of hands for light activity for 2 weeks then usual activity

Outcomes to be expected
Outcomes of steroid injection

- 80% have transient improvement of symptoms (of these 20% remain symptoms free at one year)
- Failure to improve after injection is poor prognostic factor
- Surgery is less effective in these patients

Outcomes after carpal tunnel release

- Temporary improvement with steroid injections is a good prognostic factor that the patient will have a good result with surgery)
- Pinch strength returns in 6 week
- Grip strength is expected to return to 100% preoperative levels by 12 weeks postop
- Rate of continued symptoms at 1+ year is 2% in moderate and 20% in severe CTS
- Improved patient reported-outcomes with surgery at 6 and 12 months as compared to splinting, NSAIDs/therapy, and a single steroid injection

Outcomes after revision of carpal tunnel release in recurrent case

- 25% will have complete relief after revision CTR
- 50% some relief
- 25% will have no relief

Complications

- Wound infection (rare)
- Hypertrophic scar and keloid
- progressive thenar atrophy due to injury to an unrecognized transligamentous motor branch of the median nerve
- lumbrical muscle weakness secondary to neuropraxia of the proper palmar digital nerve to the index finger
- Recurrence of symptoms (according to prognostic factors mentioned above)

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De Quervain's Tenosynovitis

Definition: De Quervain's tenosynovitis is a stenosing tenosynovial inflammation of the 1st dorsal compartment.

Referral Category: The patient may present to soft tissue hand clinic.

Consent – principle of shared decision-making

- Discussion with the patient should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes
- The patient's values, occupation and upper limb function requirements should be discussed and considered in a joint decision making process

Diagnostic guidelines:

- Clinical: symptoms, tenderness over 1st dorsal compartment at level of radial styloid, positive provocative tests (Finkelstein and Eichhoff).
- negative radiological skeletal findings.
- negative electrophysiological studies for nerves.
- superficial probe ultrasonography may be helpful.

Recommended guidelines for treatment

- Non-operative treatment is the first line of treatment. Most cases improve
  - NSAIDS, rest and immobilisation usually first step
  - Steroid injections into first dorsal compartment usually second step. Maximal 4 injections 1 month apart
- Operative treatment

  Timing and indications
  - Severe symptoms
  - usually consider after 6 months of failed non-operative management

Staff

These surgeries to be done by a surgeon who is competent in nerve and tendon entrapment surgery.

Environment

Ordinary operating theatre

Equipment:

- Adequate Light
- Hand surgery instrumentation
- Appropriate sutures
- Tourniquet and the associated infrastructure
- Bipolar diathermy with fine tip

Anesthesia: Usually local or regional. General for non-cooperative patient

Technical aspects:

- Radial based incision proximal to the wrist
- Protect the superficial radial sensory nerve
- Release on dorsal side of 1st compartment to prevent volar subluxation of the tendon
- EPB is more dorsal than APL
- Has variable anatomy with APL usually having at least 2 tendon slips and its own fibro- osseous compartment
- A distinct EPB sheath is often encountered dorsally

Additional measures

- The use of pharmacological agents to reduce nerve pain should be considered, and where appropriate started early
- Perioperative antibiotics

Postoperative therapy Requirements

- Early use of hands for light activity for 2 weeks then usual activity

Outcomes to be expected

- Most cases resolve with non-operative management
- Surgical-site tenderness is expected for several months
- High recurrence rate

Complications

- Injury of Sensory branch of radial nerve injury with Neuroma formation
- Failure to decompress with recurrence may be caused by failure to recognize and decompress EPB or APL lying in separate subsheath/compartment
- Complex regional pain syndrome

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Dupuytren's contracture

Fibrous bands that draw the finger (and sometimes the thumb) into the palm and prevent them from straightening fully cause it. If not treated the finger(s) may bend so far into the palm that they cannot be straightened. All treatments aim to straighten the finger(s) to restore and retain hand function condition, which can recur after any intervention so that further interventions are required.

Consent – principle of shared decision-making

- Discussion with the patient should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes
- The patient's values, occupation and upper limb function requirements should be discussed and considered in a joint decision making process

Diagnostic guidelines:

- Diagnosis is made with careful history and physical examination
- Decreased ROM of affected fingers
- Painful palm nodules
- Palpation of nodule in the pretendinous bands of the palmar fascia. Nodule beyond MCPJ is strong clue suggesting spiral cord displacing digital nerve midline and superficial
- Most commonly involve small or ring finger
- Look for MCP or PIP contracture
- Look for bilateral involvement and ectopic associations (plantar fascia). indicative of more aggressive form (Dupuytren's diathesis)

Recommended guidelines for treatment

- Several treatments are available: collagenase injections, needle fasciotomy, fasciectomy and dermofasciectomy. None is entirely satisfactory with some having slower recovery periods, higher complication rates or higher reoperation rates (for recurrence) than others. The need for, and choice of, intervention should be made on an individual basis and should be a shared decision between the patient and a
- No one knows which interventions are best for restoring and maintaining hand function throughout the rest of patient's life and which is cheapest and most cost-effective in the long term...

Treatment is not indicated in cases where there is no contracture, and in patients with mild (less than 20°) contractures, or one, which is not progressing and does not impair function.

An intervention (collagenase injections, needle fasciotomy, fasciectomy and dermofasciectomy)

Should be considered for:

- Finger contractures causing loss of finger extension of 30° or more at the metacapophalangeal joint or 20° at the proximal interphalangeal joinit.
- Server thumb contractures which interfere with function.

Collagenase (if available) should only be used for:

Participants in the ongoing clinical trial :

- Adult patients with a palpable cord if there is evidence of moderate disease (functional problems and metacarpophalangeal joint contracture of 30° to 60° and proximal interphalangeal joint contracture of less than 30° or first web contracture) plus up to two affected joints;
- Needle fasciotomy is not considered appropriate, but limited fasciectomy is considered appropriate by the treating hand surgeon

Staff

These surgeries to be done by a surgeon who is competent in nerve and Dupuytren contracture.

Environment

Ordinary operating theatre

Equipment:

- Adequate Light
- Hand surgery instrumentation
- Appropriate sutures
- Tourniquet and the associated infrastructure
- Bipolar diathermy with fine tip
- Loupe magnification

Anesthesia: Usually regional. General for non-cooperative patient

Additional measures

- The use of pharmacological agents to reduce nerve pain should be considered, and where appropriate started early
- Perioperative antibiotics

Postoperative therapy requirements

- Splinting for 2 weeks
- Early use of hands for light activity after splint removal then usual activity

Reported Outcomes and complications

- Hematoma
- Flare reaction
- Neurovascular injury
- Digital ischemia
- Wound edge necrosis/slough
- Infection
- Postop swelling
- Stiffness, instability, flexion contracture
- Recurrence: 30% at 1-2y, 15% at 3-5y, 10% at 5-10y, and <10% after 10y. Higher recurrence with non-operative measures (needle aponeurotomy and collagenase injection)
- Risk factors of recurrence
    - Dupuytren diathesis (age <50, white men, bilateral hands DD, family history, ectopic disease outside the palm including Ledderhoses, Peyronies, Garrods pads)
    - Patients with Dupuytren diathesis may need more aggressive follow-up and treatment

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Ganglion

Ganglia are cystic swellings containing jelly-like fluid which form around the wrists or in the hand. In most cases wrist ganglia cause only mild symptoms which do not restrict function, and many resolve without treatment within a year. Wrist ganglion rarely press on a nerve or other structure, causing pain and reduced hand function. Ganglia in the palm of the hand (seed ganglia) can cause pain when carrying objects. Ganglia which form just below the nail (mucous cysts) can deform the nail bed and discharge fluid, but occasionally become infected and can result in aseptic arthritis of the distal finger joint.

Recommended guidelines

Wrist ganglia

** No treatment unless causing pain or tingling/numbness or concern (worried it is a cancer).
** Aspiration if causing pain, tingling/numbness or concern
** Surgical excision only considered if aspiration fails to resolve the pain or tingling/numbness and there is restricted hand function.

Seed ganglia are painful

* Puncture/aspirate the ganglion using a hypodermic needle
* Surgical excision only considered if ganglion persists or recurs after puncture/aspiration.

Mucous cysts

No surgery considered unless recurrent spontaneous discharge of fluid or significant nail deformity.

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Trigger finger in adults

Trigger digit occurs when the tendons which bend the thumb/finger into the palm intermittently jam in a tight tunnel (flexor sheath) through which they run.
Mild triggering is a nuisance and causes infrequent locking episodes. Other cases cause pain and loss and unreliability of hand function. Mild cases require no treatment and may resolve spontaneously.
Mild cases which cause no loss of function require no treatment or avoidance of activities which precipitate triggering and may resolve spontaneously.

Recommended guidelines

* **Cases interfering with activities or causing pain should first be treated with:**

  a. One or two steroid injections which are typically successful (strong evidence), but the problem may recur, especially in diabetics
  b. Splinting of the affected finger for 3-12 weeks (weak evidence).

* **Surgery should be considered if:**
  a. The triggering persists or recurs after one of the above measures (particularly steroid injections).
  b. The finger is permanently locked in the palm.
  c. The patient has previously had 2 other trigger digits unsuccessfully treated with appropriate nonoperative methods;
  d. Diabetics.

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Congenital trigger thumb

- Pediatric condition of the thumb that results in abnormal flexion at interphalangeal (IP) joint, usually begins with notable thumb triggering that progresses to a fixed contracture
- 3 per 1,000 children are diagnosed by the age of 1 years. 25% are bilateral. flexor pollicis longus (FPL) tendon is thickened due to abnormal collagen degeneration and synovial proliferation. increased FPL tendon diameter, compared to the A1 pulley, causes disruption of normal tendon gliding.
- Spontaneous resolution is unlikely after age of 2 years old

Referral Category: The patient may present to soft tissue hand clinic.

Diagnostic guidelines:

- Clinical
  - Fixed thumb flexion deformity at the IP joint. may be bilateral
  - Prominence of the flexor tendon nodule, referred to as "Notta's node"
  - Deformity may be fixed with loss of IP joint extension
- Negative radiological skeletal findings
- Superficial probe ultrasonography may be helpful

Consent – principle of shared decision-making

- Discussion with the parents should include all options, and outline of their rehabilitation requirements for each option, and the likely outcomes.

Recommended guidelines for treatment

Non-operative treatment is the first line of treatment.

- Passive extension exercises and observation
  - Indications: only for flexible deformity. not recommended for fixed deformities in older children
  - Technique
    - Passive thumb extension exercises
    - Duration based on clinical response
  - Outcomes
    - 30-60% will resolve spontaneously before the age of 2 years old
    - <10% will resolve spontaneously after 2 years old
- Intermittent extension splinting
  - **Indications**
    - Consider alongside stretching regime
    - Only for flexible deformity, not recommended with fixed deformity in older children
  - **Technique**
    - Splints maintain IP joint hyperextension and prevent MCP joint hyperextension
    - Duration for 6-12 weeks
  - **Outcomes**
    - 50-60% resolution in all age groups
    - High drop out rate from therapy

Operative treatment

Timing and indications

- Fixed deformity beyond age of 12 months of age
- Failed conservative treatment

Staff

These surgeries to be done by a surgeon who is competent in nerve and tendon entrapment surgery.

Environment

Ordinary operating theatre

Equipment:

- Adequate Light
- Hand surgery instrumentation
- Appropriate sutures
- Tourniquet and the associated infrastructure
- Bipolar diathermy with fine tip
- Magnifying loupe

Anesthesia: General

Technical aspects:

- Small transverse incision in the thumb MCP flexion crease, extending over the A1 pulley
- Protect the radial digital nerve
- Sharp dissection of the A1 pulley, identify the Notta nodule in the FPL tendon, watch nodule under direct vision during passive IP extension of the thumb to ensure there is smooth FPL tendon gliding
- Complete relaease of A1 pulley under direct vision

Additional measures

- The use of pharmacological agents to reduce nerve pain should be considered, and where appropriate started early
- Perioperative antibiotics

Postoperative therapy requirements

- Early use of hands

Outcomes to be expected

- 65-95% resolution in all age groups

Complications

- Digital nerve injury: caution must be performed during release as digital nerves at high risk due to proximity to flexor tendon and A1 pulley
- Wound complications: infection (rare), scar contracture (occasional)
- IP flexion deficit (occasional), Bow-stringing of flexor tendon (occasional), usually related to release of the oblique pulley

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Congenital syndactyly

Syndactyly is the most common congenital malformation of the limbs, 1 in 2,000 - 2,500 live birth, M > F, Caucasians > African Americans, positive family history in 10-40% of cases. It may be associated with conditions eg

- Acrosyndactyly (digits fuse distally and proximal digit has fenestrations (e.g., constriction ring syndrome)
- Poland Syndrome
- Apert Syndrome
- Carpenter syndrome
- Acrocephalopolysyndactyly

Referral Category: The patient may present to soft tissue hand clinic.

Diagnostic guidelines:

- **Clinical**
  - Which fingers, define the classification type, look for other congenital anomalies
  - Plain x-ray for complex and complicated cases

Consent – principle of shared decision-making

  - Discussion with the parents should include all options, an outline of their rehabilitation requirements for each option, and the likely outcomes

Recommended guidelines for treatment:

Operative treatment

Timing and indications

- If multiple digits are involved perform procedure in two stages with at least 3 months apart (do 1 side of a finger at a time) to avoid compromising vasculature
- Release digits with significant length differences first to avoid growth disturbances
- Release border digits first (ring-little, and thumb-index) at <6mths because of differential growth rates between ring-little and between thumb-index digits
- Middle-ring syndactyly can be released later (2yr old) as because middle and ring digits have similar growth rates
- Do all releases before school age
- Bilateral hand releases
  - Perform simultaneously if child is <18mths (less active)
  - Perform staged if child is >18mths (more active, hard to immobilize bilateral limbs simultaneously)
- Acrosyndactyly: perform in neonatal period

Staff: These surgeries to be done by a surgeon who is competent in congenital hand surgery

Environment

Ordinary operating theatre.

Equipment:

- Adequate Light
- Hand surgery instrumentation
- Appropriate sutures
- Tourniquet and the associated infrastructure
- Bipolar diathermy with fine tip
- Magnifying loupe
- Equipment's for skin grafting

Anesthesia: General

Technical aspects:

- Interdigitating zigzag flaps are created during release to avoid longitudinal scarring.
- Dorsal fasciocutaneous flaps to reconstruct the web.
- Liberal use of skin grafts.

Additional measures

- The use of pharmacological agents to reduce nerve pain should be considered, and where appropriate started early.
- Perioperative antibiotics.

Postoperative therapy requirements

- Scheduled dressing
- Splinting may be needed
- Anti-scarring applications

Outcomes to be expected

- Web creep: most common complication of surgical treatment (8-60%) may be early or late.
- Nail deformities in compelte syndactyly
- Flexion contracture (occasional)
- Secondary surgery may beneeded

Complications

- Skin graft loss (occasional)
- Flap necrosis (rare)
- Wound infection (rare)

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Congenital construction rings

Amniotic constriction band term used to describe a wide range of associated congenital anomalies, including annular constrictions of single or multiple fingers, single or multiple extremities with or without oligodactyly, acrosyndactyly, talipes equinovarus, cleft lip and cleft palate, and hemangiomas. Additional, less common clinical manifestations include complete absence of the limb, short umbilical cord, craniofacial disruptions, neural tube defects, cranial defects, scoliosis, and body-wall defects, such as gastroschisis and extrathoracic heart. Some of these manifestations occur at birth at only a very low frequency because they result in spontaneous abortion. It occurs in hands and fingers 80% of the time. Greater than 90% occur distal to wrist

Referral category:

These are cold cases. The only congenital hand anomaly that may be relatively urgent are the congenital constriction rings with evidence of limb perfusion compromise. These cases should be referred as earlier as possible to be evaluated thoroughly regarding the vascularity of the extremity.
Usually there is no surgical interference before the age of 6 months.
Consent – principle of shared decision-making

- Discussion with the parents should include all options, an outline of the treatment and their ehabilitation requirements for each option, and the likely outcomes
- The staged operations which may are needed in a large group of those patients should be explained for parents.
- If there is a sacrifice of a digit, this should be explained top the parents.

Operative management requirements

Timing of surgery:

- Emergency surgical interference if there is any vascular compromise
- For type I, it can be treated starting from the age of 6-12 months
- For type II and III, treatment can be delayed till the age of 6 months as long as there is no vascular compromise.
- Staged procedures can be done with a 3 months interval.

Staff

- Done or supervised by a surgeon who is competent in the repair congenital constriction rings.

Environment

Equipment

- It should be carried out in a designated operating theatre withanestheticequipment forinfants
- Adequate Light
- Hand surgery instrumentation
- Appropriate sutures
- Tourniquet and the associated infrastructure
- Loupe magnification
- Bipolar diathermy with fine tip

Anesthesia: General by a competent anesthesiologist

Technical aspects:

Many techniques. Most commonly multiple z plasty.

Additional measures

- Antibiotics should be used preoperatively with choice of agent as per local guidelines.

Expected outcome.

- Improvement of the contour is usually obtained in type I
- For other types, variable degrees of improvement according to the condition of the limb distal to the rings
- Revision surgery may be needed
- Scarring is expected after these procedures
- Some sensory loss has been reported
- Amputation is very rarely the outcome in case of sever vascular compromise

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*To be revised in 2024

Guidelines of Lower limb for reconstruction

This guideline should be with harmony and communication with other specialty of special interest like orthopedic and vascular surgeons and society.

I try to collect the principal recommendation from The British Association of Plastic, Reconstructive and Aesthetic Surgeons (BAPRAS) and the British Orthopedic Association (BOA) about the standard for management of open fractures of the lower limb.

The items below is the item covered in this subject through only recommendation without details taken completely from the British guideline for open fracture in the lower, many other details will be ready in case of agreement

1- ***Complex open wound with fractures, Primary management in the emergency department***
2- ***Antibiotic prophylaxis***
3- ***Timing of wound excision in open fractures (wound debridment)***
4- ***Degloving injuries***
5- ***Temporary wound dressings***
6- ***Timing of soft tissue reconstruction***
7- ***Type of soft tissue reconstruction***
8- ***Compartment syndrome***
9- ***When things go wrong with soft tissues***
10- ***Guidelines for primary amputation***
11- ***Outcome measures***

Complex open wound with fractures, Primary management in the emergency department

Surgical experience and the development of multidisciplinary teams are key factors in good patient outcome for many conditions, including polytrauma, complex lower limb trauma.

Soft tissue injury patterns:

(a) Skin loss such that direct tension free closure is not possible following wound excision
(b) Degloving
(c) Injury to the muscles which requires excision of devitalized muscle via wound extensions
(d) Injury to one or more of the major arteries of the leg.

These descriptions reduce the ambiguity that may arise from classification systems which have inter-observer variability. If any of the features is noted, it is recommended that such patients are transferred to a specialist center as soon as the patient's condition allows, and preferably to enable primary surgical management (wound debridement and skeletal stabilization) to be undertaken there.

It is likely that the specialist centers will be organized on a regional basis in conjunction with local trauma networks. In most cases, the specialist center will also provide the regional service for major trauma. These centers

1- Include plastic and microvascular surgery, with expertise in vascular reconstruction
2- Provide facilities for simultaneous debridement by orthopaedic and plastic surgical teams
3- Ensure orthopaedic and plastic surgical planning of management strategy to avoid multiple episodes of treatment, thereby ensuring efficient and optimal patient care
4- Provide dedicated theatre sessions for the combined orthoplastic management of the patients during the normal working day
5- Include microbiology and infectious disease consultants with expertise in musculoskeletal infection
6- Include facilities for emergency musculoskeletal imaging, with angiography and interventional radiology
7. Provide a service for, or have access to, artificial limb tting and rehabilitation for amputees.
8. Have access to physical and psychosocial rehabilitation services.
9. Include audit of outcome as part of the care pathway.
10. Aim to reach a throughput of 30 such cases per annum to maintain appropriate skill and experience levels.
11. Provide combined orthoplastic clinics and multidisciplinary ward rounds.
12. Possess intensive care and other trauma facilities for the multiply injured patient.
13. Initial assessment and treatment of the patient occurs simultaneously and in accordance with advanced trauma life support (ATLS®) principles.
14. Assessment of the open tibial injury is systematic, careful and repeated in order to identify established or evolving limb-threatening conditions, and to document limb status prior to manipulation or surgery.
15. Haemorrhage control is through direct pressure or, as a last resort, application of a tourniquet.
16. Wounds are handled only to: (a) Remove gross contaminants (b) Photograph for record(c) Seal from the environment.
17. Wounds are not 'provisionally cleaned' either by: (a) Exploration(b) Irrigation.
18. Limb splintage is by the most appropriate means of immobilization available in the emergency department. Provisional external fixators are not applied.
19. Antibiotic and anti-tetanus prophylaxis are given.
20. In addition to two orthogonal views of the tibia, radiographic assessment includes the knee and ankle joints.
21. In addition to two orthogonal views of the tibia, radiographic assessment includes the knee and ankle joints.
22. Antibiotics should be administered as soon as possible after the injury and certainly within 3 h.

- The antibiotic of choice is co-amoxiclav (1.2g 8 hourly) or a cephalosporin (e.g. cefuroxime 1.5g 8 houly), and this should be continued until rst de-bridement (excision).
- At the time of rst debridement, co-amoxiclav (1.2 g) or a cephalosporin (such as cefuroxime 1.5 g) and gentamicin (1.5 mg/kg) should be adminis- tered, and co-amoxiclav/cephalosporin continued until soft tissue closure or for a *maximum* of 72 h, whichever is sooner.
- Gentamicin 1.5 mg/kg and either vancomycin 1 g or teicoplanin 800 mg should be given on induction of anaesthesia at the time of skeletal stabiliza- tion and de nitive soft tissue closure. These should not be continued post operatively. The vancomycin infusion should be started at least 90 min prior to surgery.
- Patients with anaphylaxis to penicillin should receive clindamycin (600 mg IV 6 hourly preoperatively) in place of co-amoxiclav/cephalosporin. For those with lesser allergic reactions, a cephalosporin is considered to be safe and is the agent of choice.

Timing of wound excision in open fractures

1- Broad-spectrum antibiotics (co-amoxiclav 1.2 g 8 hourly or cefuroxime 1.5 g 8 hourly or clindamycin 600 mg 6 hourly if anaphylaxis to penicillin) are administered as soon after the injury as possible
2- The only reasons for immediate surgical exploration are the presence of: (a) Gross contamination of the wound **(b)** Compartment syndrome**(c)** A DE vascularized limb **(d)** A multiply injured patient.
3- In the absence of these criteria, the wound, soft tissue and bone excision (debridement) is performed by senior plastic and orthopaedic surgeons working together on scheduled trauma operating lists within normal working hours and within 24 hours of the injury unless there is marine, agricultural or sewage contamination. The 6-hour rule does not apply for solitary open fractures.

Guidelines for wound debridement (excision)

1- Early, accurate debridement of the traumatic wound is the most important surgical procedure in the management of open lower limb fractures.
2- Debridement means excision of all devitalized tissue (except neurovascular bundles).
3- Traumatic wounds are excised comprehensively and systematically and the following sequence **is followed in all cases:**
   (a) Initially, the limb is washed with a soapy solution and a tourniquet is applied
   (b) The limb is then 'prepped' with an alcoholic chlorhexidine solution, avoiding contact of the antiseptic with the open wound and pooling under the tourniquet
   (c) Soft tissue debridement/ excision is safely performed under tourniquet control, especially in cases of extensive degloving. This allows identification of key structures such as neurovascular bundles, which may be displaced, and permits accurate examination of tissues by avoiding blood-staining
   (d) Visualization of the deeper structures is facilitated by wound extensions along the fasciotomy lines
   (e) The tissues are assessed systematically in turn, from superficial to deep (skin, fat, muscle, bone) and from the periphery to the center of the wound. Non-viable skin, fat, muscle and bone are excised
   (f) At this stage the injury can be classified and definitive reconstruction planned jointly by the senior members of the orthopaedic and plastic surgical team
   (g) If definitive skeletal and soft tissue reconstruction is not to be undertaken in a single stage, then a vacuum foam dressing (or antibiotic bead pouch if there is significant segmental bone loss) is applied until definitive surgery is performed.

Bone exposure, decontamination and preservation: debridement

1- Extension of the traumatic wound is along the nearest fasciotomy incision
2- Whilst a bloodless field during soft tissue debridement may be helpful, deflating the tourniquet before bone debridement allows satisfactory confirmation of a 'capacity of the bone ends to bleed'. This is probably the most useful determinant of bone viability.
3- Careful surgical delivery of bone ends through the wound extension aids circumferential assessment.
4- Particulate foreign matter is removed with periodic irrigation to keep clear visibility of the surgical field.
5- Loose fragments of bone which fail the 'tug test' are removed.
6- Fracture ends and larger fragments which fail to demonstrate signs of viability are removed.
7- Major articular fragments are preserved as long as they can be reduced and fixed with absolute stability.
8- Lavage follows once a clean wound is obtained by a meticulous zone-by-zone debridement.
9- High pressure pulsatile lavage is not recommended.

DE gloving injury

1- Degloving of the limb occurs in the plane superficial to the deep fascia and the extent of injury is often underestimated.
2- Thrombosis of the subcutaneous veins usually indicates the need to excise the overlying skin.
3- Circumferential degloving often indicates that the involved skin is not viable.
4- In severe injuries, multiplanar degloving can occur, with variable involvement of individual muscles and these may be stripped from the bone. Under these circumstances, a second look may be necessary to ensure that all the nonviable tissues have been excised prior to definitive reconstruction within 7 days.

Four patterns of degloving have been proposed

1. Localized degloving[1]
2. Non-circumferential single plane degloving
3. Single plane circumferential degloving[1]
4. Circumferential and multiplanar degloving.

ClassifiCation of open fraCtures

1- Accurate, simple and reproducible systems for classification of lower limb in- juries facilitate communication between healthcare professionals, assist transfer of appropriate cases to specialist centers and should lead to a treatment plan.
2- They provide a platform for conducting detailed audit of care to ensure optimal management of these patients.
3- The Gustilo and Anderson grading is widely used and is relatively simple, but has poor interobserver reliability and is best applied after wound excision.
4- Other systems, such as the AO system, are comprehensive but best used for audit and data collection of outcomes.

Temporary Wound dressings

1- Negative pressure dressings may reduce bacterial ingress and tissue desiccation as well as avoid pooling of serous fluid.
2- Negativepressuredressingsarenotusedasasubstituteformeticuloussurgical wound excision.
3- Negative pressure dressings are not a substitute for coverage of exposed fractures with vascularized flaps.
4- Antibiotic impregnated bone cement beads under a semi-permeable membrane are associated with reduced infection rates.
5- These beads are most applicable in patients with segmental bone loss, gross contamination or established infection, perhaps in combination with negative pressure dressings.

Techniques for skeletal stabilization in open tibial fractures

1- Spanning external fixation is recommended when definitive stabilization and immediate wound cover is not carried out at the time of primary debridement.
2- Fracture patterns and bone loss determine the most appropriate form of definitive skeletal stabilization.
3- Exchange from spanning external fixation to internal fixation is done as early as possible.
4- Internal fixation is safe if there is minimal contamination and soft tissue coverage is achieved at the same time as insertion of the implant.
5- Modern multiplanar and circular fixators are used if there is significant contamination, bone loss and multilevel fractures of the tibia.

Timing of soft tissue reconstruction

1- Local flaps are safely performed at the same time as skeletal fixation. Internal fixation is only undertaken if soft tissue coverage can be performed at the same time.
2- Free flap reconstruction is best performed on scheduled trauma lists by experienced, dedicated senior surgical teams following adequate preparation of the patient, including imaging such as angiography or computed tomography (CT) scanning of comminuted fractures. This should be undertaken in a specialist center.
3- There is little evidence for the 5-day rule. Microsurgery is best performed before the vessels become friable or fibrosed and this becomes increasingly likely after the first week. We recommend that definitive soft tissue reconstruction be undertaken within the first 7 days after injury.

Type of soft tissue reconstruction

1- All open fractures are covered with vascularized soft tissue.
2- Dressings such as those using foam with negative pressure can temporize following wound excision but are not to be used as a substitute for definitive flap coverage.
3- Relatively low energy tibial fractures are covered by local fasciocutaneous flaps so long as the vascularity has not been compromised by the zone of injury and degloving.
4- Strong clinical evidence to support the use of one form of soft tissue cover over another in open tibial shaft fractures is absent. However, available experimental data would suggest that diaphyseal tibial fractures with periosteal stripping are best covered by muscle aps instead of fasciocutaneous aps.
5- Metaphyseal fractures, especially those around the ankle, are best covered by fasciocutaneous flaps, including free flaps.

Compartment Syndrome

1- Compartment syndrome is a surgical emergency and must be diagnosed promptly and treated.
2- The early signs are paraesthesia in the distribution of the sensory nerves passing through the affected compartment and disproportionate pain, especially on passive stretch of the affected muscles.
3- These important signs may be affected by the previous administration of peripheral nerve blocks and regional anaesthesia, as well by the presence of nerve injury.
4- Compartment syndrome does not usually result in the loss of peripheral pulses. Absent pulses should alert the surgeon to the possibility of vascular injury.
5- Intracompartment pressure measurement is performed most reliably using devices designed specifically for this purpose. A difference of 30 mmHg or less between the measured pressure and the diastolic blood pressure is a reasonable threshold for decompression.
6- Every effort is made to achieve an accurate diagnosis because inappropriate fasciotomy can be associated with significant morbidity.
7- The two-incision technique provides optimal access for four-compartment decompression. The medial incision does not compromise availability of local fasciocutaneous flaps. It can also be used to extend pre-existing traumatic lacerations to achieve access for debridement as well as provide an approach to the posterior tibial vessels as recipient vessels for free flaps.
8- All non-viable muscle is excised and fasciotomy wounds either closed with split skin grafts or directly, if possible, once the swelling has reduced.
9- A late diagnosis of compartment syndrome is a management dilemma. Once the muscle is no longer viable, compartment release will predispose to infection and may result in compartmentectomy or amputation of the limb.

Vascular injuries

1- Devascularized limbs are a surgical emergency. They are recognized immediately and require urgent surgical exploration. The aim is to restore circulation within 3–4 h of the injury, after which muscle death begins. The maximum acceptable delay is 6 h of warm ischemia time.
2- Capillary refill in the toes can be misleading and, if the circulation is not normal compared to the contralateral limb, there is a low threshold for exploration.
3- Absent peripheral pulses are not attributed to vascular spasm or compartment syndrome. A major vascular injury is always considered and senior surgical opinion is sought.
4- Preoperative angiography in the devascularized limb wastes valuable time. It is possible to define the level of injury from the fracture configuration and site of any dislocation.
5- Shunting significantly reduces the morbidity associated with these injuries by reducing the ischemic time. Muscle suffers irreversible ischemic dam- age within 3–4 h of complete ischemia. Nerves are also susceptible to ischemic injury.
6- Once the circulation is restored, the limb is reassessed with regards to the potential for salvage.
7- The skeleton is then stabilized before replacing the shunts with reversed vein grafts.
8- Proximal to the level of the trifurcation, any deep venous injury is also re- constructed.
9- Access incisions for vascular repair take into account the necessity for flap cover and the presence of adjacent fractures.
10- Fasciotomy is performed if indicated by the presence of raised intracompartmental pressures compared to the diastolic blood pressure. However, it is important that these measurements are performed repeatedly, as muscle swelling may not develop until several hours after revascularization
11- The presence of a single patent artery to the foot is not a contraindication to free flap reconstruction using end-to-side anastomoses. In this situation, reconstruction of the injured vessels is considered, especially the posterior tibial artery.

Open fractures of the foot and ankle

1- These are particularly challenging injuries owing to the limited local soft tissue flap options, likelihood of injury to the neurovascular bundles, intra-articular fractures predisposing to poor long-term function and difficulty in stabilizing the fractures.
2- Amputation is considered when the final functional outcome following reconstruction is likely to be inferior to a trans tibial amputation. This is especially likely to be the case for a ' floating ankle' injury or crush injuries with an open mid- and fore-foot.
3- Initial skeletal stabilization is achieved with a spanning external fixator, avoiding fibular plating. There are inherent difficulties in stabilizing these fractures as the anchor points for most spanning external xators rely on an intact os calcis/talus/metatarsals.
4- Definitive skeletal fixation is performed at the time of soft tissue cover- age. The exact configuration will depend on the fracture pattern, with intra-articular fractures usually best managed by internal fixation. Internal fixation is not recommended in the absence of adequate soft tissue cover as this may be associated with an increased risk of deep sepsis.
5- **Degloved plantar skin:**
   (a) If suprafascial, is defatted and replaced as full-thickness graft
   (b) If subfascial and proximally based, is sutured back without tension
   (c) If subfascial and distally based, is considered for revascularization.

6- Plantar soft tissue loss is best managed using fasciocutaneous flaps and reinnervation may confer some protection against the development of neuropathic ulceration. Dorsal skin loss can be managed by split skin grafts or thin, free fasciocutaneous flaps.
7- Open pilon fractures are stabilised with a spanning external fixator. If the planned definitive treatment is internal fixation of the tibial plafond, and provided the soft tissues permit, open reduction and internal xation of the fibula at primary surgery may help to assist maintain the limb out to length. Soft tissue cover should be by way of thin, pliable fasciocutaneous aps.
8- Injuries to the posterior tibial nerve are accurately assessed and consideration is given to reconstruction of segmental defects of the posterior tibial artery with autologous vascular graft. End-to-end anastomoses to avulsed vessels are performed with care as it can be difficult to assess the extent of intimal damage.
9- Open hind-foot injuries are managed as for a diaphyseal injury when only one articular surface is involved. When there is greater disruption of the hind-foot, a transtibial amputation is considered.
10- Isolated open mid-foot injuries are often caused by heavy objects falling on the foot. These result in significant postoperative stiffness and pain due to ligamentous disruption and again, amputation is considered.
11- Open fore-foot injuries involving the first metatarsal are treated as aggressively as open diaphyseal injuries. When the other metatarsals are injured in isolation, a ray amputation results in a reasonable return to ambulation.

When things go wrong with soft tissues

1- Necrosis of a local flap over the fracture site is managed by early return to theatre and revision surgery to achieve healthy soft tissue coverage.
2- Limited tip congestion may respond to leech therapy.
3- Some local fasciocutaneous aps may be more prone to develop complications in patients with comorbidities.
4- Free flap complications are reduced by patient preparation, careful planning and performing the anastomoses outside the zone of injury: ideally proximally.
5- There is a low threshold for immediate re-exploration of a free flap with suspected circulatory compromise.
6- Deep infection requires a return to the operating theatre, fracture site exploration, debridement, dead space management and antibiotic therapy. Fracture fixation may need revision.

When things go wrong with bone

1- Early complications with bone occur as a consequence of the original injury or from surgery.
2- Problems that present are: **(a)** Wound leakage **(b)** Sepsis (c) Loss of alignment.
3- Common causes include inadequate debridement, haematoma formation, in- appropriate or delayed soft tissue cover and unstable fixation. Each cause is sought and remedied promptly.
4- An expectant approach is seldom fruitful and, if adopted, should be for a limited period only.
5- A decision to intervene is taken if there is failure to improve.
6- Early problems can exert an undue influence on the final outcome unless weighed for significance and acted upon appropriately and promptly.
7- Discussion of the case with the nearest specialist center is encouraged and gives the opportunity to correct the problem at the earliest opportunity.

Guidelines for primary amputation

1- A primary amputation is performed as a damage control procedure if there is uncontrollable haemorrhage from the open tibial injury (usually from multiple levels of arterial/venous damage in blast injuries) or for crush injuries exceeding a warm ischemic period of 6 h.
2- Primary amputation is also needed for incomplete traumatic amputations where the distal remnant is significantly injured.
3- A primary amputation is considered an option where injury characteristics include one or several of the following: **(a)** Avascular limbs exceeding a 46 h hour threshold of warm ischemia **(b)** Segmental muscle loss affecting more than two compartments **(c)** Segmental bone loss greater than one-third of the length of the tibia.
4- Absent or reduced plantar sensation at initial presentation is not an indication for amputation.
5- Amputation levels are preferably transtibial or transfemoral (if salvage of the knee is not possible). Through-knee amputations are not recommended for adults.
6- The decision to amputate primarily should be taken by two consultant surgeons with, if possible, patient and family involvement.
7- Discussion with the nearest specialist center is advised when there is uncertainty or disagreement between surgeon recommendations and patient/family wishes.

Outcome measures

1- Patient health status questionnaires such as the Sickness Impact Profile and Medical Outcomes Study Short Form-36 (SF-36) provide a valuable overall assessment of the patient.
2- Union time of diaphyseal fractures can be difficult to assess but is an accepted outcome measure.
3- Rates of significant complications such as deep infection, flap failure and secondary amputation are recorded.
4- Limb function scores such as the Enneking Score, which is expressed as a percentage of the contralateral uninjured limb, are recommended.
5- Periarticular injuries ideally should include measures of the affected joints.

Management of severe open fractures in children

1- The wound for open pediatric fractures is debrided (excised) as recommended for adults. There is no evidence to suggest that tissues with compromised viability are more likely to recover in children compared to adults.
2- Skeletal fixation is determined by the fracture configuration. The use of intramedullary devices may be limited by the presence of growth plates.
3- The available evidence suggests that children under the age of 12 years (pre- pubertal) are likely to have shorter union times.
4- Soft tissue reconstruction for open fractures in children of all ages relies on vascularized flaps, as it does for adults.

Guidelines of Burn

I. Emergency room management

Apply the general trauma guidelines

Primary survey

- Airway: Voice, air exchange, and patency should be noted.
- Breathing: Check breath sounds and chest wall excursion
- Circulation: Check skin color, pulse, BP, neck veins, and any external bleeding.
- Neurological assessment: Check Glasgow coma score.
- Expose the patient.

Initial resuscitation

- Administer oxygen nasally or by mask.
- Endotracheal Intubation is done if patency of airway is at risk or massive edema is to be expected (by ICU physicians)
- Insert at least two large peripheral intravenous lines. Start Ringer's lactate at 1 L/h in adult patients or 30ml/kg in children
- Insert urinary catheter.
- Antibiotics and tetanus prophylaxis
- Pain control with small intravenous doses of an opiate
- Consult ICU physicians and other trauma related specialties if needed

Secondary survey

- Thorough history and physical examination
- Burn assessment
  1. Measure the burn percent using the Lund and Browder Chart
  2. Assess burn depth clinically
  3. Assess circumferencial burns in extremities, chest and neck for emergency escharotomy

II. Criteria for admission and referral

A. Al-Hussien hospital

- **Admission of the following cases**

Adults with Burn size 20-30% TBSA
Children with Burn size 15-30% TBSA or larger percent in presence of written consultation from pediatric intensives with available bed in pediatric ICU when needed at any time
Full thickness burn ≥ 5% TBSA in any age group
Circumferential burns and burns involving face, hands, feet, perineum, genitalia, or major joints
Associated trauma and comorbid states
Electrical burns and Chemical burns

- **Referral in presence of any of the following:**

Inhalation injury (except in presence of available bed in the hospital ICU)
Adults with Burn size more than 30% TBSA
Children with Burn size more than 30% TBSA in absence of available bed in pediatric ICU

B. Bab-Elsha'areyya hospital

- **Admission of the following cases**

Adults with Burn size ≥20% TBSA
Children with Burn size ≥15% TBSA
Full thickness burn ≥ 5% TBSA in any age group
Circumferential burns and burns involving face, hands, feet, perineum, genitalia, or major joints
Associated trauma and comorbid states
Electrical burns and Chemical burns

- **Referral in presence of any of the following:**

Absence of available bed in ICU in patients indicated for ICU admission

III. Initial inpatient burn management

Fluid resuscitation

- **In the initial 24 hours give**
  1. Adults and children with burns greater than 20% TBSA should undergo formal fluid resuscitation.
  2. Give crystalloid 2 - 4 ml/kg body weight/%TBSA during the first 24 hours. Half in 1st 8 hours.
  3. Add maintenance fluids containing glucose in children in addition to their calculated formula.
  4. Fluid resuscitation, should be titrated to maintain a urine output of approximately 0.5–1.0 ml/kg/hr in adults and 1.0 –1.5 ml/kg/hr in children.

- **After the initial 24 hours**
  1. Standard maintenance fluids.
  2. Burn losses = 1 cc/kg/%BSA.
  3. Insensible losses up to one liter per day.
  4. Give albumin and/or fresh frozen plasma and subtract them from calculated needs.
  5. keep urine output of 1500-2000 CC/day in adults and 2-3 ml/kg/hr in children.

Escharotomies

- Done immediately in all full thickness circumferential burns.
- Circumferential deep dermal burns: for follow up till manifestations of vascular compromise.
- Faciotomy if there is still compartment syndrome after proper escharotomy,

Inhalation injuries

Managed in collaboration with ICU physicians

Diagnosis:

- Any patient with a history of burn in a closed space, loss of consciousness, or altered mental status
- patients with facial burns, cough or carbonaceous sputum
- Evidence of upper airway edema, including hoarseness, stridor, or wheezing.

Treatment

- immediate administration of 100% oxygen
- Maintenance of the airway is critical.
- Intubation and extubation decisions are left to ICU physicians
- Order for
    1. Titrated high-flow humidified oxygen to maintain SaO2 > 92%.
    2. Deep breathing exercises and chest physiotherapy.
    3. Nebulizing 5000 IU heparin with 3 cc saline /4 h for 7 days.
    4. Nebulize bronchodilators every 4 h for 7 days
    5. Nebulize 3 cc N-acetylcysteine 20% solution/4 h for 7 days (if available)
    6. Early ambulation.
    7. Sputum cultures

IV. Burn wound management

Initial wound care

- The patient's wounds should be cleansed with soap and water.
- Remove loose and dead tissue.
- Evacuate blisters and leave its roof as biological cover.

Subsequent wound care

Individualized according to

1. Burn depth and extent
2. Patient's general condition

SUPERFICIAL PARTIAL THICKNESS BURN

- **< 40% TBSA:** Coverage with Vaseline gauze till healing or dressing with 1% Silver Sulfadiazine
- **> 40% TBSA options are** (in order of preference)
    1. Biological dressings: amniotic membrane or allograft applied in OR under GA
    2. Coverage with Vaseline gauze till healing or dressing with 1% Silver Sulfadiazine

DEEP AND MIXED PARTIAL THICKNESS BURN

- **< 40% TBSA:** Initial treatment with Vaseline gauze or dressing with 1% Silver Sulfadiazine and areas that don't show healing signs after 10 days or progressing to deeper burns are treated surgically
- **> 40% TBSA; initial treatment options are:** (in order of preference)
    1. Biological dressings: amniotic membrane or allograft applied in OR under GA
    2. Coverage with Vaseline gauze till healing or dressing with 1% Silver Sulfadiazine

Areas that don't show healing signs after 10 days or progressing to deeper burns are treated surgically

FULL THICKNESS BURN

- Initial dressing with 1% Silver Sulfadiazine
- Early excision and coverage with autograft and/or allograft
- Staged excision and auto/allografting: for large percents. Excise 10% in each operative session and dress remaining burn with Silver Sulfadiazine
- Delayed excision: if the situation precluded complete excision of burn wound in the first weak
- Excision and coverage with allograft alone in infected burn and when the level of excision is doubtful
- Topical antimicrobials and autografting of a granulating wound: only in patients with strong and clear contraindication for surgery or if no available blood

Hand burns

- Consult physiotherapy dept.
- Splinting in intrensic plus position
- Active and passive exercises twice daily.
- Early excision in deep dermal or full thickness burns

Face

- **Dressing for 2 weeks by:**
  - Moist exposure with ointment or
  - Amniotic membrane coverage
  - Excision should be delayed due to high healing potential

V. General Treatment of Burned Patients

Nutritional support

- Calculate calories and protein needs and translate into actual food assisted with feeding formulas
- Give multivitamines
- If no adequate intake in 1st 3 days, insert NGT for burn > 25%

Hyperglycemia

- Random blood sugar is checked daily
- If it is found above 150mg/dl, it should be measured every 6 hours
- Insulin therapy should started if blood sugar become persistently above 150mg/dl

Hypoproteinemia

- Always develops but it is less sever with good nutrition
- Treated by albumin and FFP

Anemia

- Aim of blood transfusions is to keep hemoglobin level above 8 gm/dl
- Operating blood loss should be anticipated and replaced

Stress Ulcer Prophylaxis

- The best prophylaxis for stress ulcers is enteral nutrition
- H2 blockers should be given if needed

Deep Venous Thrombosis Prophylaxis

- By ambulation and exercise
- By LMW heparin in bed ridden patients

Pain management and psychosocial support

- If patient says he or she has pain, then he or she has pain.
- Analgesics are most effective when given on a regular basis so paracetamol is given/4 hours and the dose is adjusted to weight
- Tramadol is added regularly if paracetamol is not enough
- Stronger opioids with dressing changes

Electrolytes and acid base balance

In collaboration with ICU physicians

Management of infections

- Common infections include: burn wound infection, UTI, chest infecions and venous line infection
- These sites should always regularly checked clinically and by cultures with prompt treatment and consultation of other concerned specialties

V. skin banking

- To increase the availability of skin allografts in our department, harvesting and banking of the skin excised in body contouring procedures is done as following:
- Screen cases admitted for body contouring procedures for HBV, HCV, HIV
- Harvest skin grafts from excised flaps postoperatively
- Store the skin in glycerol 85% after keeping it in glycerol 50% with antibiotic and 70% successively for 6 hours of each step in room temperature
- Before use, the graft is washed vigorously and kept in saline for 45 minutes p

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقة الخطية المستنيرة على جراحة تجميل الندبات
Scar Revision Surgery

بصفتك جزء من العملية الطبية ومشارك في اتخاذ القرار الطبي تم تصميم هذا الاقرار للتأكد من المامك التام المستنير بالإجراءات الطبية المتبعة وانه قد تمت الاجابة على كل تساؤلاتك واستفساراتك بواسطة الطبيب المعالج.

1. اعطى بموجب هذا الاذن الى الطبيب: ----------ومساعديه لعمل تجميل للندبه الموجوده فى .....
2. لقد شرح لي الطبيب كافة الخطوات. كما أننى اتعهد بالالتزام بتوصيات الطبيب وفى حالة إخلالي بمتابعة اوامر الطبيب فأن الطبيب والفريق الطبي المساعد له غير مسئولين عن النتيجة.
3. العلاج الجراحي للندبات هو إجراء يتم إجراؤه بشكل متكرر من قبل جراحي التجميل .الندبات هي نتيجة لا يمكن تجنبها من الإصابات أو الحروق أو الجراحة .من المستحيل اختفاء الندبة تمامًا بالجراحة التجميلية والتي قد تحسن مظهر وملمس الندبات .هناك العديد من التقنيات المختلفة لجراحه تجميل للندبات .وقد تحتاج إلى علاجات أخرى بما في ذلك العلاج الطبيعي او العلاجات الموضعية بالإضافة إلى الجراحة.
4. تتكون العلاجات البديلة من عدم معالجة الندبة أو حقن أدوية من نوع الكورتيزون أو استخدام مشدات ضغط خاصة توضع فوق الندبة .أو علاج بالليزر ويمكن استخدام تقنيات جراحية أخرى لمراجعة الندبات .ترتبط المخاطر والمضاعفات المحتملة ايضا بالبدائل العلاجية.
5. اتفهم تماما حدوث تورم وتهيج واحمرار او ازرقاق في منطقه الجراحة.
6. من الجائز الشعور بعدم الرضا من الشكل النهائي عقب الجراحة.
7. على الرغم من توقع نتائج جيدة، لا يوجد ضمان صريح أو ضمني، على النتائج التي يمكن الحصول عليها.
8. مشاكل التئام الجروح: بعض الحالات الطبية والمكملات الغذائية والأدوية قد تؤخر وتتداخل معها الالتئام. المدخنون أكثر عرضة لخطر فقدان الجلد ومضاعفات التئام الجروح.
9. الندبات: جميع العمليات تترك ندبات، بعضها أكثر وضوحا من البعض الآخر. على الرغم من التئام الجروح بشكل جيد بعد الجراحة الإجراء المتوقع، قد تحدث ندوب غير طبيعية داخل الجلد والأنسجة العميقة .في حالات نادرة، قد تنتج ندبات مرتفعة keloid، قد تكون الندوب غير جذابة ولونها مختلف عن لون البشرة المحيطة.
10. حدوث عدوى بموضع الجراحة مما قد يتطلب إعطاء مضادات حيوية ومزيدا من العلاج.
11. نزيف موضع الجراحة مما قد يتطلب مزيدا من التداخلات الجراحية.
12. انغماد للغرز الجراحية تحت سطح الجلد مما قد يسبب أعراضا تستدعي تداخلات طبية وجراحية أخرى.
13. اقر بأني اسمح للطبيب بأخذ صور قبل وبعد الجراحة لمتابعة النتائج مع عدم السماح بعرض هذه الصور وأنها تخضع للعلاقة السرية بين الطبيب والمريض.
14. قد يحدث حساسية من أي من مكونات المواد المستخدمة في الجراحة.
15. لقد أتيحت لي فرصة كافية لمناقشة حالتي وعلاجي مع طبيبي ومعاونيه، وتمت الإجابة على كافة استفساراتي بشكل مقبول لي. أنى أعطيت ما يكفي من المعلومات التي يمكنني على ضونها أن أتخذ قراراً مستنيراً بشأن الخضوع للعلاج الموصي به. وأفهم أنه لا ينبغي على أن أوقع اسمي على هذا النموذج حتى يتم الإجابة على كافة أسئلتي بشكل مقبول لي وحتى أفهم كل الكلمات أو المصطلحات الواردة في هذا النموذج.

الموافقة الخطية المستنيرة على جراحة تجميل الندبات
Scar Revision Surgery

النموذج المعتمد من الجمعية المصرية لجراحى التجميل والاصلاح

المقر بما فيه (الاسم ثلاثى): ..... ☐ ذكر ☐ انثى السن : .....

الصفة : ☐ المريض ☐ ولى الامر ☐ قريب ☐ أخرى .....

في حالة عدم توقيع المريض السبب ☐ قاصر ☐ قصور ذهنى ☐ غائب عن الوعى ☐ أخرى .....

التوقيع : ..... التاريخ : ..... الوقت : ..... رقم تحقيق الشخصية: .....

❖ الشاهد/ المترجم على توقيع المريض

الاسم : ..... التوقيع: ..... التاريخ: ..... الوقت: ..... الرقم القومى: .....

إقرار الطبيب

لقد شرحت محتويات هذه الوثيقة للمريض / المرافق وأجبت على أسئلة المريض/ ..... ، وإلى حد علمي، المريض قد تم إعلامه بشكل كاف وقد أعطى موافقته.

❖ نوع التخدير المستخدم اثنـــاء الجراحة ☐ تخدير كلى ☐ تخدير نصفى ☐ تخدير موضعى ☐ اعطاء مهدئ

المقر بما فيه:

الطبيب المعالج (الاسم الثلاثي): ..... التوقيع: ..... القسم التابع له: ..... التاريخ: ..... الوقت: .....

ملاحظات هامـــة:

- لا يسمح بإجراء أي تعديلات علي هذا النموذج بعد الانتهاء من تعبئته وإنما يستبدل بنموذج آخر جديد.
- يحتفظ المريض أو من ينوب عنه بنسخة من هذا الإقراروبعتبر سارى لمدة اسبوع من تاريخ توقيع المريض

رقم تذكرة المريض .....

الموافقة الخطية المستنيرة على اجراء التقشير الكيمائي
Chemical Skin Peels & Treatments

بصفتك جزء من العملية الطبية ومشارك في اتخاذ القرار الطبي تم تصميم هذا الاقرار للتأكد من المامك التام المستنير بالإجراءات الطبية المتبعة وانه قد تمت الاجابة على كل تساؤلاتك واستفساراتك بواسطة الطبيب المعالج.

1. اعطى بموجب هذا الاذن الى الطبيب: ..... ومساعديه لعمل تقشير كيميائي نوع .....
2. لقد شرح لي الطبيب كافة الخطوات. كما أنني اتعهد بالالتزام بتوصيات الطبيب وفى حالة إخلالي بمتابعة اوامر الطبيب فأن الطبيب والفريق الطبي المساعد له غير مسئولين عن النتيجة.
3. يتم إجراء التقشير الكيميائي للجلد والعلاجات الجلدية الأخرى لعلاج مجموعة متنوعة من اضطرابات الجلد .مثل أضرار أشعة الشمس والتجاعيد والتصبغ غير المتكافئ باستخدام هذه التقنيات غير الجراحية، هناك العديد من التقنيات والأنظمة المختلفة للتقشير الكيميائي وعلاج الجلد .في بعض الحالات، يمكن إجراء التقشير الكيميائي في وقت العمليات الجراحية الأخرى .التقشير الكيميائي للجلد وإجراءات علاج الجلد الأخرى ليست بديلاً لجراحة شد الجلد عندما يكون مترهلا.
4. الخيارات الأخرى المتاحة هي عدم معالجة الجلد بعوامل تقشير كيميائية أو أدوية أخرى .يمكن تحسين الصبغات الجلدية والتجاعيد الجلدية عن طريق علاجات أخرى مثل علاج التقشير بالليزر، أو جراحة لشد الجلد المترهل .ترتبط المخاطر والمضاعفات المحتملة بأشكال العلاج البديلة.
5. اتفهم تماما حدوث تورم وتهيج واحمرار بالوجه في فترة ما بعد التقشير والتي قد تمتد لأكثر من أسبوع.
6. آثار الشمس ضارة على الجلد. تعريض الجلد المُعالج الي الشمس يؤدي إلى زيادة الندبات وتغيرات اللون وسوء الشفاء.
7. على الرغم من أن العدوى بعد تقشير الجلد الكيميائي غير عادية، إلا أن العدوى البكتيرية والفطرية والفيروسية يمكن أن تحدث .يمكن أن تحدث عدوى فيروس الهربس البسيط حول الفم بعد التقشير الكيميائي.
8. على الرغم من التئام الجروح بشكل جيد بعد الإجراء، قد تحدث ندوب غير طبيعية داخل الجلد والأنسجة العميقة .في حالات نادرة، قد تنتج ندبات مرتفعة keloid، قد تكون الندوب غير جذابة ولونها مختلف عن لون البشرة المحيطة.
9. يمكن أن تؤدى عوامل التقشير الكيميائي الى تفتيح لون بشرتك بشكل دائم .هناك إمكانية لتغيرات غير منتظمة في اللون داخل الجلد بما في ذلك المناطق الأفتح والأغمق.
10. قد يستمر الاحمرار بعد التقشير الكيميائي لفترات طويلة.
11. قد لا يحسن التقشير الكيميائي الجلد تمامًا أو يمنع الاضطرابات الجلدية والتصبغ أو التجاعيد المستقبلية. لا توجد تقنية يمكنها عكس علامات شيخوخة الجلد.
12. اذا كنت تتناول اكيوتان accutane يجب أن تناقش هذا الأمر مع جراحك. هذا الدواء قد يضعف قدرة الجلد على الشفاء بعد العلاج.
13. مستحضرات التقشير الكيميائي التي تحتوي على الفينول تنتج دقات قلب غير طبيعية قد تتطلب علاجًا طبيًا إذا حدثت أثناء الإجراء.
14. الجلد يمكن أن يظهر أفتح أو أغمق من الجلد المحيط. على الرغم من أنه غير شائع، قد يستمر تغير لون الجلد لفترات طويلة، وفي حالات نادرة، قد يكون دائمًا.
15. اقر بأني اسمح للطبيب بأخذ صور قبل وبعد التدخل المطلوب لمتابعة النتائج مع عدم السماح بعرض هذه الصور وأنها تخضع للعلاقة السرية بين الطبيب والمريض.
16. لقد أتيحت لي فرصة كافية لمناقشة حالتي وعلاجي مع طبيبي ومعاونيه، وتمت الإجابة على كافة استفساراتي بشكل مقبول لي. انى أعطيت ما يكفي من المعلومات التي يمكنني على ضوئها أن أتخذ قراراً مستنيراً بشأن الخضوع للعلاج الموصي به. وأفهم أنه لا ينبغي على أن أوقع اسمي على هذا النموذج حتى يتم الإجابة على كافة أسئلتي بشكل مقبول لي وحتى أفهم كل الكلمات أو المصطلحات الواردة في هذا النموذج.

التوقيع: المريض: ..... المرافق: ..... التاريخ: ..... الساعة: .....

إقرار الطبيب

لقد شرحت محتويات هذه الوثيقة للمريض / المرافق وأجبت على أسئلة المريض/ ..... وإلى حد علمي، المريض قد تم إعلامه بشكل كاف وقد أعطى موافقته.

الطبيب: ..... التاريخ: .....

الموافقة الخطيــة المستنيرة على خطورة العدوي بالكوفيد 19
COVID-19 Risk Informed Consent

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

- أقر أنا/ اسم المريض ..... أفهم أنني أختار علاج اختياري /الإجراء /الجراحة غير العاجلة وقد لا تكون ضرورية من الناحية الطبية .كما أفهم أن الفيروس التاجي الجديد COVID-19 قد أعلن أنه جائحة عالميه من منظمة الصحة العالمية .أفهم أيضًا أن COVID-19 معدي للغاية ويعتقد أنه تنتشر عن طريق الاتصال من شخص لآخر؛ ونتيجة لذلك، توصي الوكالات الصحية بالتباعد الاجتماعي.

- أدرك أن الدكتور ..... وجميع الموظفين في ..... / اسم المنشأة (تراقب هذا الوضع عن كثب وقد وضعت تدابير وقائية تهدف إلى الحد من انتشار .COVID-19 ومع ذلك، نظرا لطبيعة الفيروس، أنا أتفهم أن هناك خطرًا كامنًا للإصابة بـ COVID-19 بحكم الشروع في ذلك العلاج / الإجراء /الجراحة الاختيارية.

- اقر بهذا وافترض خطر الاصابه بالعدوى COVID-19 من خلال هذا العلاج/الإجراء/ الجراحة الاختيارية، وأعطى اذنى الصريح للدكتور ..... وجميع الموظفين في ..... منشأة للمضى قدماً في الإجراء.

- أفهم أنه حتى لو تم اختباري لـ COVID وحصلت على نتيجة اختبار سلبية، فإن الاختبارات في بعض الحالات قد تفشل في اكتشاف الفيروس أو ربما أصبت بـ COVID بعد الاختبار .أنا أفهم ذلك، إذا كان لدي عدوى COVID-19 ، وحتى إذا لم يكن لدي أي أعراض تنفسيه، فنتيجة لاختياري هذا، يمكن أن يؤدي العلاج /الإجراء /الجراحة إلى فرصة أكبر للمضاعفات الوقاية.

- أفهم أن التعرض المحتمل لـ COVID-19 قبل /أثناء /بعد العلاج /الإجراء /الجراحة قد ينتج عن ذلك ما يلي :التشخيص الإيجابي لـCOVID-19 ، والحجر الصحي / العزل الذاتي الممتد، والاختبارات الإضافية، الذي قد يتطلب العلاج الطبي، العناية المركزة، والحاجة المحتملة للتنفس الصناعي قصير المدى أو طويل المدى، المضاعفات المحتملة الأخرى، وخطر الموت .بالإضافة إلى ذلك، بعد العلاج /الإجراء /الجراحة الاختيارية، قد أحتاج إلى رعاية إضافية قد تتطلبها لي أن أذهب إلى غرفة الطوارئ أو المستشفى.

- أفهم أن COVID-19 قد يسبب مخاطر إضافية، قد لا يعرف بعضها أو الكثير منها حاليًا هذه المرة، بالإضافة إلى المخاطر الموضحة هنا، بالإضافة إلى تلك المخاطر للعلاج /الإجراء /الجراحة بحد ذاتها.

- لقد تم إعطائي خيار تأجيل العلاج /الإجراء /الجراحة إلى تاريخ لاحق .ومع ذلك، أفهم جميع المخاطر المحتملة، بما في ذلك على سبيل المثال لا الحصر، المضاعفات المحتملة قصيرة المدى وطويلة الأجل المتعلقة COVID-19، وأود أن أستمر في العلاج /الإجراء /الجراحة التي أريدها.

- لقد أتيحت لي فرصة كافية لمناقشة حالتي وعلاجي مع طبيبي ومعاونيه، وتمت الإجابة على كافة استفساراتي بشكل مقبول لي.

التوقيع: المريض: ..... المرافق: .....

التاريخ: ..... الساعة: .....

لقد عرضت على نسخه من الوثيقة. اسم المريض .....

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

الموافقة الخطية المستنيرة على التفويض بالتصوير الفوتوغرافي

أوافق على التقاط صور أو مقاطع فيديو لي أثناء إجراء (عمليات) الجراحة التجميلية التالية:

الإجراء: ..... التاريخ: .....

الإجراء: ..... التاريخ: .....

التي سيقوم بها الدكتور. ..... (طبيبي).

- أوافق كذلك على استخدام، وتحرير مثل هذه الصور الفوتوغرافية أو أشرطة الفيديو أو التاريخ المرضي من قبل طبيبي للجمعية المصرية لجراحة التجميل والاصلاح ESPRS والمكلفين بها.

- أوافق على نشر هذه الصور الفوتوغرافية أو أشرطة الفيديو أو تاريخ الحالة من قبل طبيبي و / أوESPRS / أو أي طرف يتصرف بموجب ترخيصه وتفويضه في أي وسائط مطبوعة أو مرنية أو إلكترونية، ولا تقتصر على المجلات والكتب الطبية والعروض العلمية والدورات التعليمية ومواقع الإنترنت، أيضا لغرض إعلام المهن الطبية أو الجمهور بأساليب الجراحة التجميلية والنتائج، سواء كانت أو لم تكن هذه الإعدادات تعليمية أو علمية أو تجارية. ولكن لا يذكر اسمي او اسم أي فرد من عائلتي، في أي منشور. ومع ذلك، أتفهم أنه قد يتم معرفتي من صورتي او شكلي أو تاريخ الحالة المرضي.

- أدرك أنه يحق لي إلغاء هذا التفويض كتابيًا في أي وقت، ولكن إذا فعلت ذلك، فلن يكون له أي تأثير على أي إجراءات تم اتخاذها قبل الإلغاء .إذا لم ألغي هذا التفويض، فان الموافقة على ذلك ستكون من التاريخ المكتوب أدناه .أفهم أنني قد أرفض التوقيع على هذا التفويض ولن يكون لهذا الرفض أي تأثير على العلاج الطبي الذي أتلقاه من طبيبي.

- أقر بأنني أعطيت لي الفرصة لطرح كافة الأسئلة المتعلقة بذلك وأيضا بما ان يكون ذلك متوافق مع القوانين والتشريعات الطبية المعمول بها بجمهورية مصر العربية.

- أقر وأصرح بالتنازل عن جميع الحقوق التي قد تكون لدي في الصور أو أشرطة الفيديو أو التاريخ المرضي ومن أي ادعاء قد يكون متعلق به مثل الاستخدام في النشر، وبما في ذلك أي مطالبة بالدفع فيما يتعلق بتوزيعها أو نشرها في اي وسيط .أمنح هذه الموافقة كمساهمة طواعية لصالح التعليم العام وأقر بأنني قرأت التفويض والإصدار أعلاه وفهمت شروطه بالكامل.

التوقيع

المريض : ..... المرافق: ..... التاريخ: ..... الساعة: ..... الرقم القومى: .....

لقد قرأت التفويض والإصدار أعلاه .أنا الوالد أو الوصي أو المشرف على المريض او صغير السن -تحت السن القانوني .أنا مفوض لتوقيع هذه الموافقة نيابة عن المريض.

الاسم : ..... التوقيع: ..... التاريخ: ..... الوقت: ..... الرقم القومى: .....

موافقــة مستنيرة علي اجراء الجراحة بصفة عامـــة

النموذج المعتمد من الجمعية المصرية لجراحي التجميل والاصلاح

بصفتك جزء من العملية الطبية ومشارك في اتخاذ القرار الطبي تم تصميم هذا الإقرار للتأكد من المامك التام المستنير بالإجراءات الطبية المتبعة وأنه قد تمت الإجابة على كل تساؤلاتك واستفساراتك بواسطة الطبيب المعالج.

❖أعطى بموجب هذا الإذن الى الطبيب ..... ومساعديه لعمل التدخل في صورة ..... بمستشفى .....

❖لقد شرح لي الطبيب كـافة الخطـوات. كما أنني اتعهد بالالتزام بتوصيات الطبيب. وفى حالة اخلالي بمتابعة أوامر الطبيب فإن الطبيب والفريق الطبي المساعد له غير مسئولين عن نتيجة الجراحة.

❖لقد أبلغني طبيبي بأنني سأتلقى التخدير أو دواء مهدئاً، أو كليهما. وأفهم أن هناك مخاطر وآثارا جانبية مقترنة بالتخدير والمهدئات وأن هذه المخاطر والآثار الجانبية سيتم بحثها معي من قبل طبيب التخدير قبل أن يتم الإجراء.

❖أعلم تمام العلم ان الأمور الطبية قد يحدث بها أي متغيرات اثناء العملية وأن الاجراءات الطبية قد تختلف من شخص لأخر لذا أمنح الأذن لطبيبي بالقيام بما يراه مناسبا أثناء التدخل لضمان عدم تعرضي لأذى.

❖أقر بأني أسمح للطبيب بأخذ صور قبل وبعد التدخل لمتابعة النتائج مع /عدم السماح بعرض هذه الصور وأنها تخضع للعلاقة السرية بين الطبيب والمريض.

❖لقد أتيحت لي فرصة كافية لمناقشة حالتي وعلاجي مع طبيبي ومعاونيـه، وتمت الإجابـة على كافة استفساراتي بشكل مقبول لي. وأنى أعطيت ما يكفي من المعلومات التي يمكنني على ضوئها أن اتخذ قراراً مستنيراً بشأن الخضوع للعلاج الموصي به. وأفهم أنه لا ينبغي على أن أوقع اسمي على هذا النموذج حتى يتم الإجابة على كافة أسئلتي بشكل مقبول لي وحتى أفهم كل الكلمات أو المصطلحات الواردة في هذا النموذج.

❖تتضمن تكلفة الإجراء عدة رسوم مقابل الخدمات المقدمة .يشمل المجموع الرسوم التي يتقاضاها الجراح ومساعديه، وتكلفة الإمدادات الجراحية، والتخدير، والاختبارات المعملية، ورسوم المستشفى الخارجية المحتملة، اعتمادًا على مكان إجراء الجراحة .لا تشمل الرسوم المفروضة على هذا الإجـراء أي تكاليف مستقبلية محتملة للإجراءات الإضافية التي تقوم بها أو تطور المضاعفات الناتجة عن الجراحة. الجراحة الثانوية أو رسوم يوم الجراحة بالمستشفى المعنية أو جراحة المراجعة ستكون أيضا مسؤوليتك.

❖أعلم بانه قد يحدث نادرا مضاعفات للتخدير او الجراحة وقد تشمل :

❖لا توجد مضاعفات في الغالبية العظمى .ومع ذلك، يمكن أن يحدث أحيانًا عدد من الآثار الجانبية والمخاطر والمضاعفات.

1. حدوث عدوى بموضع الجراحة أو بالغشاء البروتوني يتطلب إعطاء مضادات حيوية ومزيدا من العلاج.
2. نزيف موضع الجراحة أو جرح بالأعضاء الداخلية المحيطة بموضع الجراحة مما قد يتطلب مزيدا من التداخلات الجراحية.
3. حدوث تخثرات دموية أو انسدادات غازية وعدوى بالصدر.
4. ألم وخذل أو انتفاخ موضع الجراحة أو تجمع السوائل بموضع الجراحة.
5. ندبة جراحية موضع إجراء الجراحة.
6. حدوث فتاق جراحي موضع إجراء الجراحة.
7. أزمة قلبية أو سكتة دماغية.
8. الوفاة نتيجة المضاعفات الجراحية الواردة.

التوقيع: يكتب الاسم بخط كبير وواضح

المريض:..... المرافق: .....

التاريخ: ..... الساعة: .....

إقرار الطبيب

لقد شرحت محتويات هذه الوثيقة للمريض / المرافق وأجبت على أسئلة المريض، وإلى حد علمي، المريض قد تم إعلامه بشكل كاف وقد أعطى موافقته.

الطبيب: .....