principles of suture and flap design

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Tikrit dentistry college
Tips for Surgical skill

➢ Knowledge of the basic principles of surgery

➢ Knowledge of anatomy

➢ training
Incision vs flap
Basic principles of incision in oral surgery

➢ Use new sterilized blade ( number 15 )
➢ Scalpel grasped in a pen grasp for maximum control and tactile sensetivity
➢ The incision should be made at right angle to the undelying bone
➢ The scalpel should moved in single constant firm movement
**Basic principle of flap design**

- Avoid anatomical structures
- The base wider than the apex
- Adequate width for maximum visualization
- The flap should be wider than anticipated bony defect
- Delicate handling of flap without tension
- Vertical releasing incision should start at buccal vestibule and end at the interdental
Sites where vertical releasing incision contraindicated

- Transverse incision in palate
- Lingual incision of the mandible
- Canine eminence
- Between lower premolars
Principles of Flap Design
D. Injury to Local Structures

- Maxilla: greater palatine a. & nasopalatine n./a.
Principles of Flap Design

D. Injury to Local Structures

- Mandible: lingual n. & mental n.
Types of Flaps.

• 1 Trapezoidal Flap.
• 2 Triangular Flap.
• 3 Envelope Flap.
• 4 Semilunar Flap.
• 5 Other Types of Flaps.
• 6 Pedicle Flaps.
Types of Mucoperiosteal Flaps

1. Envelope/Sulcular flap
   - 2 teeth anterior
   - 1 tooth posterior

Edentulous:
- at the crest of the ridge → removal of a *mandibular torus*
3. Envelope Flap.

- **Advantage**: Avoidance of vertical incision and easy reapproximation to original position

- **Disadvantages**: Difficult reflection (mainly palatally), great tension with a risk of the ends tearing, limited visualization in apicoectomies, limited access, possibility of injury of palatal vessels and nerves, defect of attached gingiva
2. Three-corner flap

1 tooth anterior
1 tooth posterior

- Greater access in an apical direction, especially in the posterior aspect of the mouth
2. Triangular Flap.

- **Advantage**: Ensures an adequate blood supply, satisfactory visualization, very good stability.

- **Disadvantages**: Limited access to long roots, tension is created when the flap is held with a retractor, and it causes a defect in the attached gingiva.
Three sided flap (trapezoidal flap)

Types of Mucoperiosteal Flaps

3. Four-corner flap
   1 tooth anterior
   1 tooth posterior

✓ rarely indicated
Types of Flaps

1. Trapezoidal flap.
   - **Advantage**: Provides excellent access, allows surgery to be performed on more than two teeth, produces no tension in the tissues, allows easy reapproximation of the flap to its original position.
   - **Disadvantages**: Produces a defect in the attached gingiva.
Stages of Operation

- Retraction
- Incision
- Reflection
- Bone removal
  - access
  - point of elevation
  - removal of obstruction
- Tooth section

- Delivery
- Clean-up
- Sew-up
- Check-up
- Follow-up
- Write-up
Semilunar flap

Types of Mucoperiosteal Flaps

4. Semilunar incision

✓ to approach the root apex
✓ avoids trauma to the papillae and gingival margin
✓ useful for periapical surgery of a limited extent.
✓ should not cross major prominences, ex: canine eminence
Flap for palatal tori removal

Types of Mucoperiosteal Flaps

5. Y-incision

✓ removal of a maxillary palatal torus
Flap for oro-antral fistula closure

Types of Mucoperiosteal Flaps

- Pedicle flap
  - mobilizes from one area and then rotates to fill a soft tissue defect in another area.
  - closure of oroantral communications
Intraoral flaps (buccal)
suturing
• Monofilament, multifilament

• Absorbable, non absorbable

• Natural, synthetic
SUTURE SAMPLES

Multifilament

Non-absorbable
Silk
Polyester

Absorbable
Polyglactin 910
Cat Gut

Monofilament

Non-absorbable
Polypropylene
Nylon

Absorbable
Poliglecaprone 25
Absorbable sutures

• Plain cutgut
• Chromic cutgut
• Polyglactin (vicryl)
• Polydioxanone (PDS)
Non-absorbable sutures

- Silk
- Nylone
- Polypylene (prolene)
Needles

• Needle of 18 - 26 mm in length are the suitable for oral surgery

• According to suture side of the needle
  • Eyed, eyeless

• According to the tip of the needle
  $\frac{1}{4}$ circle, $\frac{1}{2}$ circle, $\frac{3}{8}$ circle, $\frac{5}{8}$ circle
Figure 1: Example of Eyeless (Swaged) Needle (A) and Eyed Needle (B).
### Characteristics of Common Absorbable and Non-Absorbable Sutures

<table>
<thead>
<tr>
<th>SUTURE</th>
<th>Surgical Gut</th>
<th>Surgical Gut</th>
<th>Polyglycolic Acid (PGA)</th>
<th>Rapid Polyglycolic Acid (RPGA)</th>
<th>Silk</th>
<th>Nylon</th>
<th>Polypropylene</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPES</td>
<td>Plain</td>
<td>Chronic</td>
<td>Braided</td>
<td>Braided</td>
<td>Braided</td>
<td>Monofilament</td>
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</tr>
<tr>
<td>COMMON COLOR OF MATERIAL</td>
<td>Yellowish Tan</td>
<td>Blue</td>
<td>Violet</td>
<td>Undyed (Beige)</td>
<td>Black</td>
<td>Black</td>
<td>Blue</td>
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<tr>
<td>RAW MATERIAL</td>
<td>Collagen from beef and sheep</td>
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<td>Copolymer of lactide and glycolide</td>
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<td>Organic protein called fibrin</td>
<td>Long-chain aliphatic polymers</td>
<td>Long-chain polyvinyl polymers</td>
</tr>
<tr>
<td>TENSILE STRENGTH</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
<td>High</td>
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<tr>
<td>TENSILE STRENGTH RETENTION (IN VIVO)</td>
<td>3-5 days</td>
<td>7-10 days</td>
<td>28-35 days</td>
<td>10-14 days</td>
<td>Progressive degradation of fiber results in gradual loss of tensile strength</td>
<td>Progressive hydrolysis results in gradual loss of tensile strength</td>
<td>No significant changes known to occur in vivo</td>
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<tr>
<td>TISSUE INFLAMMATORY REACTION</td>
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SUTURE SAMPLES

Multifilament
- Non-absorbable: Silk, Polyester
- Absorbable: Polyglactin 910, Cat Gut

Monofilament
- Non-absorbable: Polypropylene, Nylon
- Absorbable: Poliglecaprone 25
• According to the cross section of needles
• Needle with round or oval cross section
• Needles with triangular cross section (cutting or reverse cutting)
Needle holder, tissue forceps
Needle holder vs mosquito
Basic principles of suturing

• Non touch technique
• Fewer number of suture as possible
• From mobile to fixed tissue
• 3-5 mm from margin and needle should enter at right angle to the mucosa
• Avoid over tightening, overlapping of the wound

• Undermine the incision to facilitate insertion of the needle and decrease tension
Suture techniques

• Simple interrupted suture

• Continuous suture (locking or non-locking)

• Mattress suture

• Figure of eight suturing
Needle holder rolled

Skin edge retracted

More tissue in depth than at surface

Needle rolled in arc


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<td>SURGICAL GUT</td>
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<td>STEEL</td>
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<td>multifilament</td>
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Video

Basic Knotting and Suturing Using a Needle Holder - YouTube.mp4
Thank you for listening