ENDODONTIC SURGERY
What is Endodontic Surgery?

Endodontic surgery is a surgical procedure performed to remove or correct the causative agents of radicular and periradicular disease and to restore these tissues to functional health.
Endodontic Surgery

It is often the **last hope** for retention of a tooth and therefore requires the greatest skill.
INDICATION FOR ENDO. SURGERY

- Inability to Eliminate Pathology by Conventional RCT.
  
  e.g.: calcified canal, perforation.

- Inability to Clean and Fill the Entire Root Canal by Conventional Method.

  e.g.: severe dilaceration, post & core.

- Iatrogenic Problems.

  e.g.: broken instrument, perforation.
CONTRAINDICATIONS FOR ENDO. SURGERY

1. Pathology Resolved by Conventional RCT.

2. Health Contraindications
   e.g: severely debilitated patients or taking anticoagulants

3. Anatomic Considerations
   e.g: proximity to great palatine foramen.

4. Periodontal Considerations.
PRESURGICAL PREPARATION

1. Referral Data
2. Record Review
3. Medical History Review
4. Preoperative Radiographs
5. Diagnosis
6. Case Presentation to The Patient
7. Post Surgical Complication
8. Preoperative Patient Preparation
9. Surgical Preparation
FLAP DESIGN
Rules For Flap Design

- The base is wider than the free margin.
- Incision must not be placed over any bony defect.
- Incisions that traverse a bony eminence should be avoided.
- Sharp points at the corners of the flap should be avoided.
FLAP DESIGN

Types of Flaps Used in Endo. surgery

- Gingival
- Semilunar
- Triangular
- Rectangular
- Submarginal {Ochsenbein – Luebke}
GINGIVAL (envelope)

1. Intrasulcular horizontal incision **without** vertical release

2. **Not used for apical surgery**

3. Used for root resects, root amps, hemisections, repair of cervical perfs. or resorptive defects
Gingival (envelope):

**ADVANTAGES**

1. Good for perio surgery
2. Can convert to rectangular flap if needed

**DISADVANTAGES**

1. Limited endo use
2. Not for apical surgery
3. No releasing incisions
SEMILUNAR FLAP

1. Full-thickness flap in alveolar mucosa at level of tooth apex
2. Indication for long tooth only (maxillary canine)
3. Seldom used due to poor access & scarring
4. Hemostasis may be problem
# Semilunar

## ADVANTAGES

1. Fast & easy to reflect; no exposure of crestal bone
2. Unaltered soft tissue attachment level
3. No involvement of marginal & interdental gingiva

## DISADVANTAGES

1. Poor access (least), excessive **scarring** & flap shrinkage
2. Blood supply interruption to adjacent tissues
3. Limited use in mandible
4. Unable to extend; may cross bony cavity
TRIANGULAR (Intrasulcular)

1. Most commonly used Endo SX flap
2. One vertical releasing incision; can extend to rectangular flap
3. Full-thickness flap
4. Keep 2 teeth away from pathosis
Triangular (Intrasulcular):

**ADVANTAGES**
1. Excellent wound healing potential
2. Minimal disruption of vascular supply
3. Excellent visibility & access to defects
4. Good flap reapproximation
5. Easy to suture

**DISADVANTAGES**
1. More difficult to incise & reflect
2. May be limited access due to single releasing incision
3. Possible slight gingival recession
RECTANGULAR or TRAPEZOIDAL (intrasulcular)

1. Extension of triangular flap
2. Two vertical releasing incisions
3. Horizontal intrasulcular incision
4. Use if increased reflection is needed
Rectangular or Trapezoidal

**ADVANTAGES**

1. Enhanced surgical access
2. Excellent visibility
3. Excellent wound healing potential
4. Minimal disruption of vascular supply
5. Good to view dehiscenses & fenestrations

**DISADVANTAGES**

1. More difficult to incise & reflect
2. Possible gingival recession
3. More difficult wound closure than triangular flap
SUBMARGINAL (Ochsenbein-Luebke)

1. Scalloped horizontal incision in attached gingiva & two vertical releasing incisions

2. Must be adequate attached gingiva (3-5mm)

3. Best for epithelial wound closure
SUBMARGINAL (Ochsenbein-Luebke)

ADVANTAGES
1. Does not involve marginal or interdental gingiva nor expose crestal bone
2. Minimizes crestal bone loss & gingival recession (esthetics)
3. Easy flap reapproximation

DISADVANTAGES
1. Unable to extend flap if needed
2. Disruption of blood supply to marginal tissues; must rely on collateral *
3. Limited mandibular use
4. Possible flap shrinkage & scarring
5. Limited visibility for root & crestal bone
SUTURING

- To approximate the tissue
- Provide strength to the wound
- Eliminate tissue spaces within the wound

Types:

1. **Absorbable gut** = *catgut* “plain gut“
   manufactured from collagen obtained from the small intestine of cheep or cattle

2. **Silk** - made from the protein-rich spun by silkworm larvae.
TYPES OF ENDODONTIC SURGERY

1. Incision for drainage - soft tissue
2. Trephination - I & D through the bone
3. Periaradicular surgery:
   - apical curettage
   - apicoectomy
   - apicoectomy with retrograde filling
4. Repair of perforation
5. Hemi-section and root amputation
6. Intentional replantation
INCISION
FOR DRAINAGE

Designed to

1. Release accumulated byproducts of tissue breakdown
2. Collect samples for bacteriologic analysis
3. Provide a more favorable gradient and pathway for drainage

ER TX ONLY  RELIEF OF ACUTE SYMPTOMS
TREPHINATION

A surgical technique used to **alleviate acute pain** caused by an accumulation of purulent material when drainage through the root canal is impossible.
Trephination is usually performed as an emergency procedure in the absence of soft tissue swelling.
PERIRADICULAR SURGERY
HEMI-SECTION
ROOT AMPUTATION
INTENTIONAL REPLANTATION
INTENTIONAL REPLANTATION

50 / 50 Success at best

Indication:

1. lateral perforation that can not be treated surgically.
2. Anatomy make surgery risky e.g: mental foramen, maxillary sinus
INTENTIONAL REPLANTATION

REMEMBER:

1. Do orthograde fill if possible
2. Do not touch the root
3. Work fast “less than 30 min.”
4. Stabilize if necessary
5. Reduce occlusion before extraction
6. Extraction should be non-traumatic.
POSTSURGICAL INSTRUCTION
POSTSURGICAL COMPLICATIONS

1. Pain
2. Swelling
3. Infection
4. Bleeding
5. Hematoma
6. Tissue trauma
7. Incomplete root resection
8. Malalignment of retrograde filling
9. Foreign debris in the surgical site
10. Parasthesia
FOLLOW UP
“A minimum of 2 years was considered to be sufficient to evaluate the success or failure of the treatment.”

Rud et al 1972
“The type of endodontic surgical treatment seemed not to influence the prognosis of endodontic surgery.

The success rate is higher with the use of retrofill in periapical surgery.”

Molven & Hals 1991
“Prognosis is decreased to about 30-40% in cases where endodontic surgical retreatment has been performed.”

Block et al. 1979
http://faculty.ksu.edu.sa/alnazhan/default.aspx

الاستاذ الدكتور / سعد بن عبد العزيز النزهان

PROF. SAAD AL-NAZHAN

Professor of Endodontics
Department of Restorative Dental Sciences
College of Dentistry, King Saud University
P.O. Box 50169, Riyadh 11545
Saudi Arabia

Office Phone: (+966-1) 467-7324
Secretary Phone: (+966-1) 467-7328
Fax: (+966-1) 467-7329
Email: snazhan@ksu.edu.sa