Periapical Surgery

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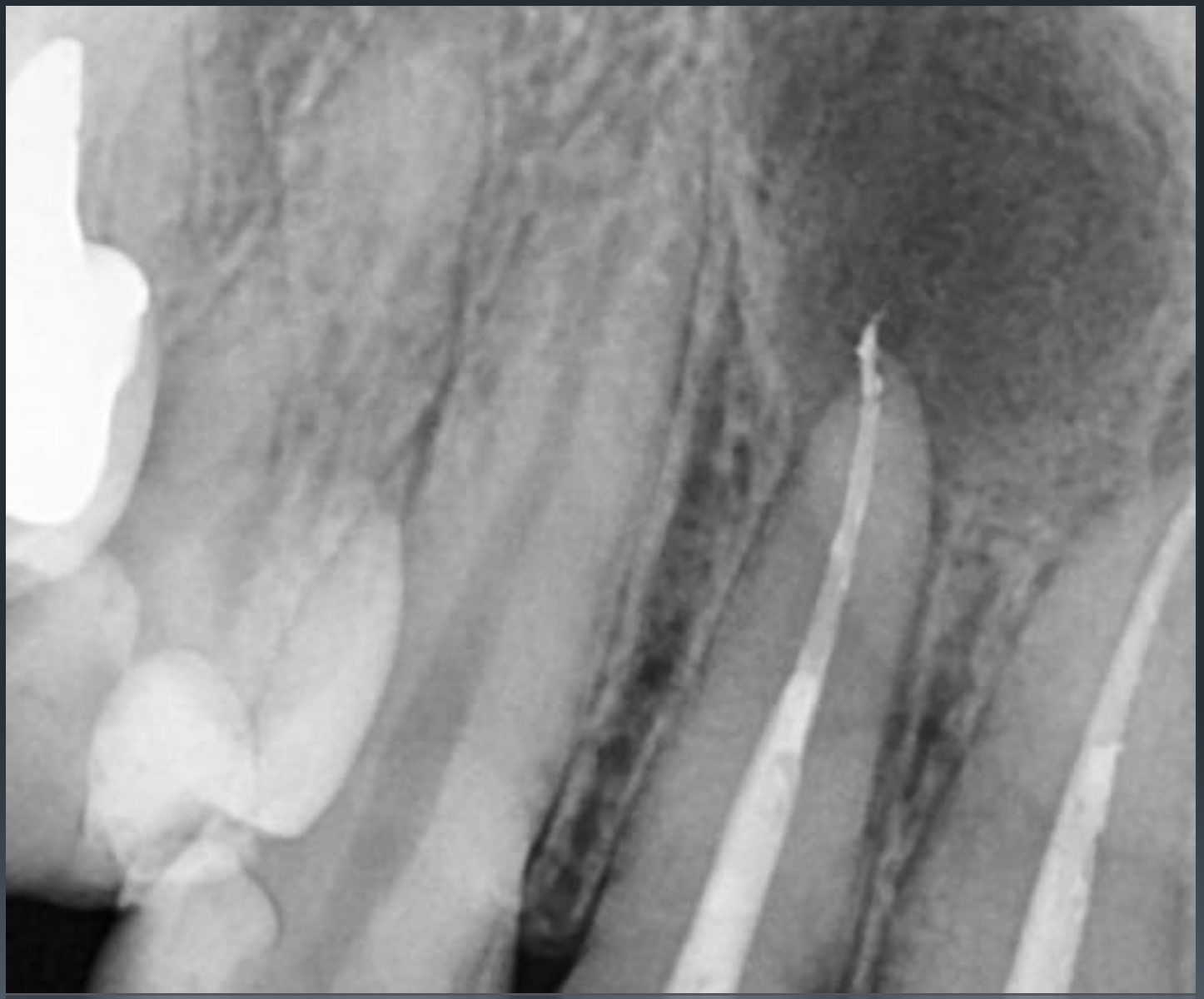
- Apicoectomy is the surgical resection of the root tip of a tooth and its removal together with the pathological periapical tissues. Accessory root canals and additional apical foramina are also removed in this way, which
- may occur in the periapical area and which may be considered responsible for failure of an endodontic therapy.



Indications

- 1. Teeth with active periapical inflammation, despite the presence of a satisfactory endodontic therapy.
- 2. Teeth with periapical inflammation and unsatisfactory endodontic therapy, which cannot be repeated because of:

✓– Completely calcified root canal.

✓– Severely curved root canals.

✓– Presence of posts or cores in root canal.

✓– Breakage of small instrument in root canal or the presence of irretrievable filling material.

- 3. Teeth with periapical inflammation, where completion of endodontic therapy is impossible due to:

✓– Foreign bodies driven into periapical tissues.

✓– Perforation of inferior wall of pulp chamber.

✓– Perforation of root.

✓– Fracture at apical third of tooth.

✓– Dental anomalies (dens in dente).

Contraindications

1. All conditions that could be considered contraindications for oral surgery concerning the age of the patient and general health problems, such as severe cardiovascular diseases, leukemia, tuberculosis, etc.
2. Teeth with severe resorption of periodontal tissues (deep periodontal pockets, great bone destruction).
3. Teeth with short root length.
4. Teeth whose apices have a close relationship with anatomic structures (such as maxillary sinus, mandibular canal, mental foramen, incisive and greater palatine foramen) and if causing injury to these during the surgical procedure is considered probable

The procedure for apicoectomy includes the following steps

1. Designing of flap.
2. Localization of apex, exposure of the periapical area and removal of pathological tissue.
3. Resection of apex of tooth.
4. Retrograde filling, if deemed necessary.
5. Wound cleansing and suturing.

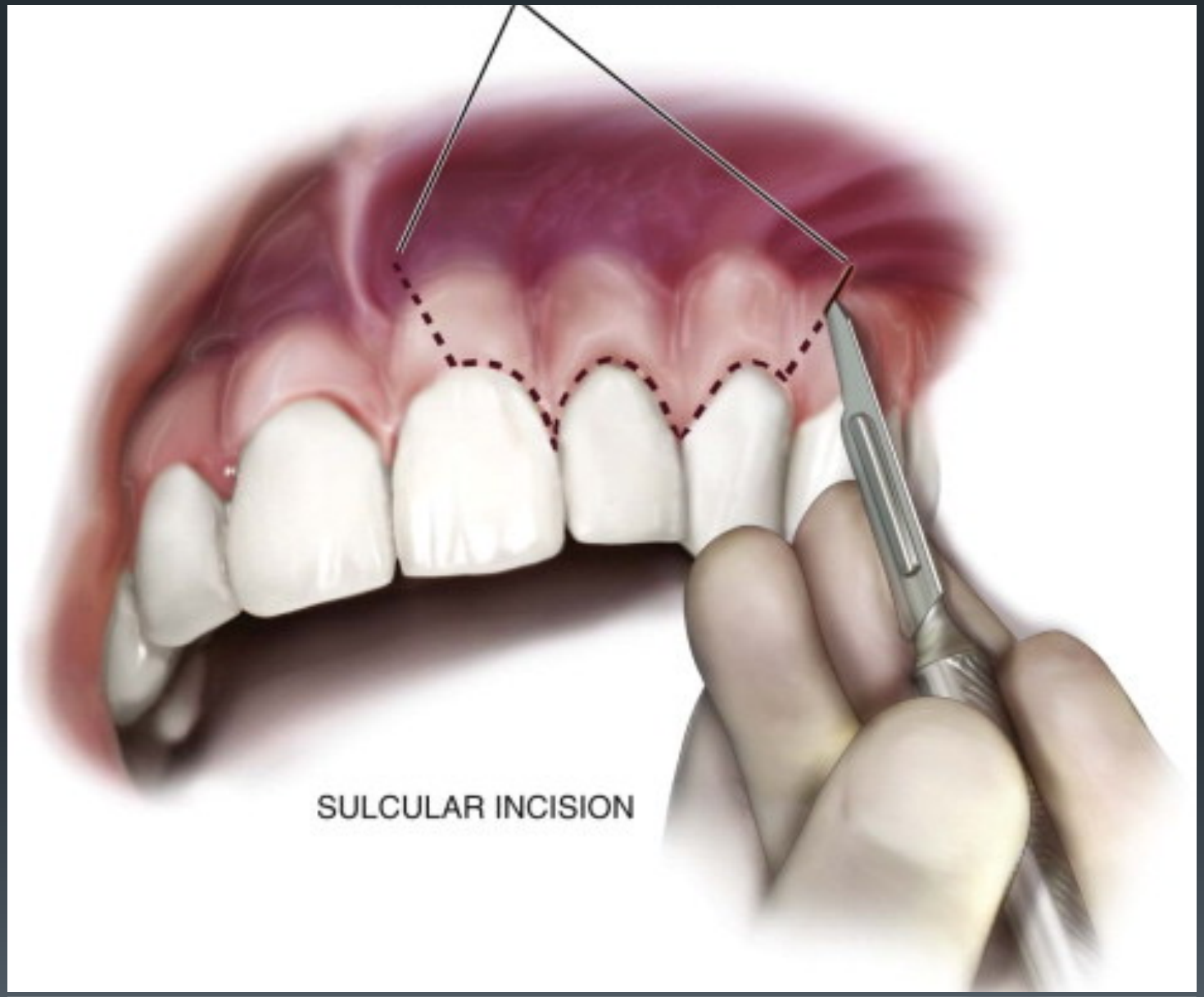
Designing of Flap

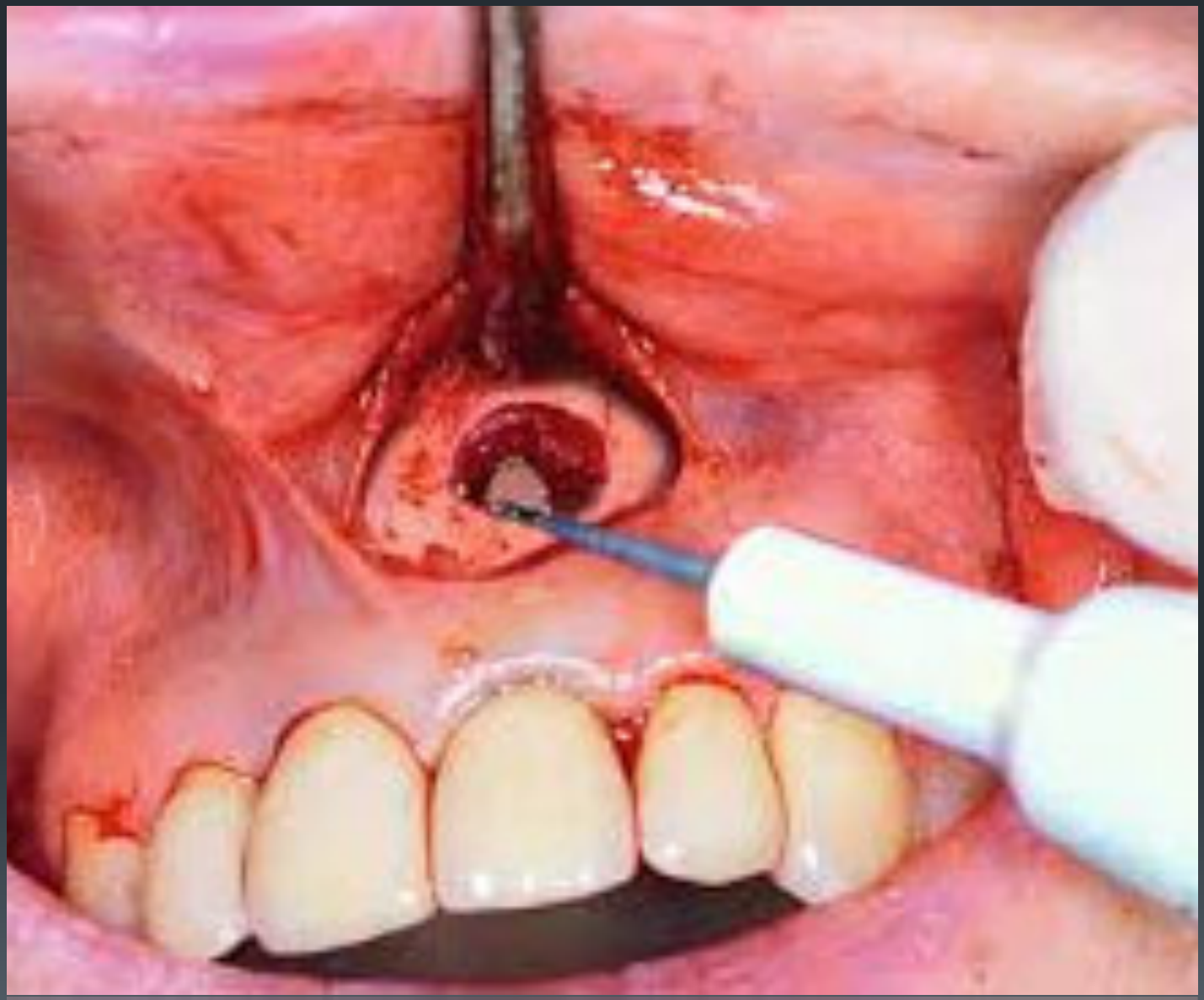
Flap design depends on various factors, which mainly include:

1. position of the tooth.
2. presence of a periodontal pocket.
3. presence of a prosthetic restoration.
4. the extent of the periapical lesion.

There are three types of flaps principally used for apicoectomy:

1. the semilunar
2. Triangular
3. trapezoidal.


SULCULAR INCISION



Localization and Exposure of Apex

1. The next step after creating a flap is **localization and exposure of the apex.** When the periapical lesion has perforated the buccal bone, localization and exposure of the root tip is easy, after removing the pathological tissues with acurette.
2. If the buccal bone covering the lesion has not been completely destroyed, but is very thin, then its surface is detected with an explorer or dental curette, whereupon, due to decreased bone density, the underlying bone is easily removed and the apex localized.
3. When the buccal bone remains completely intact, then the root tip may be located with a radiograph. More specifically, after taking a radiograph, the length of the root is determine dwith a sterilized endodontic file or metal endodontic ruler.

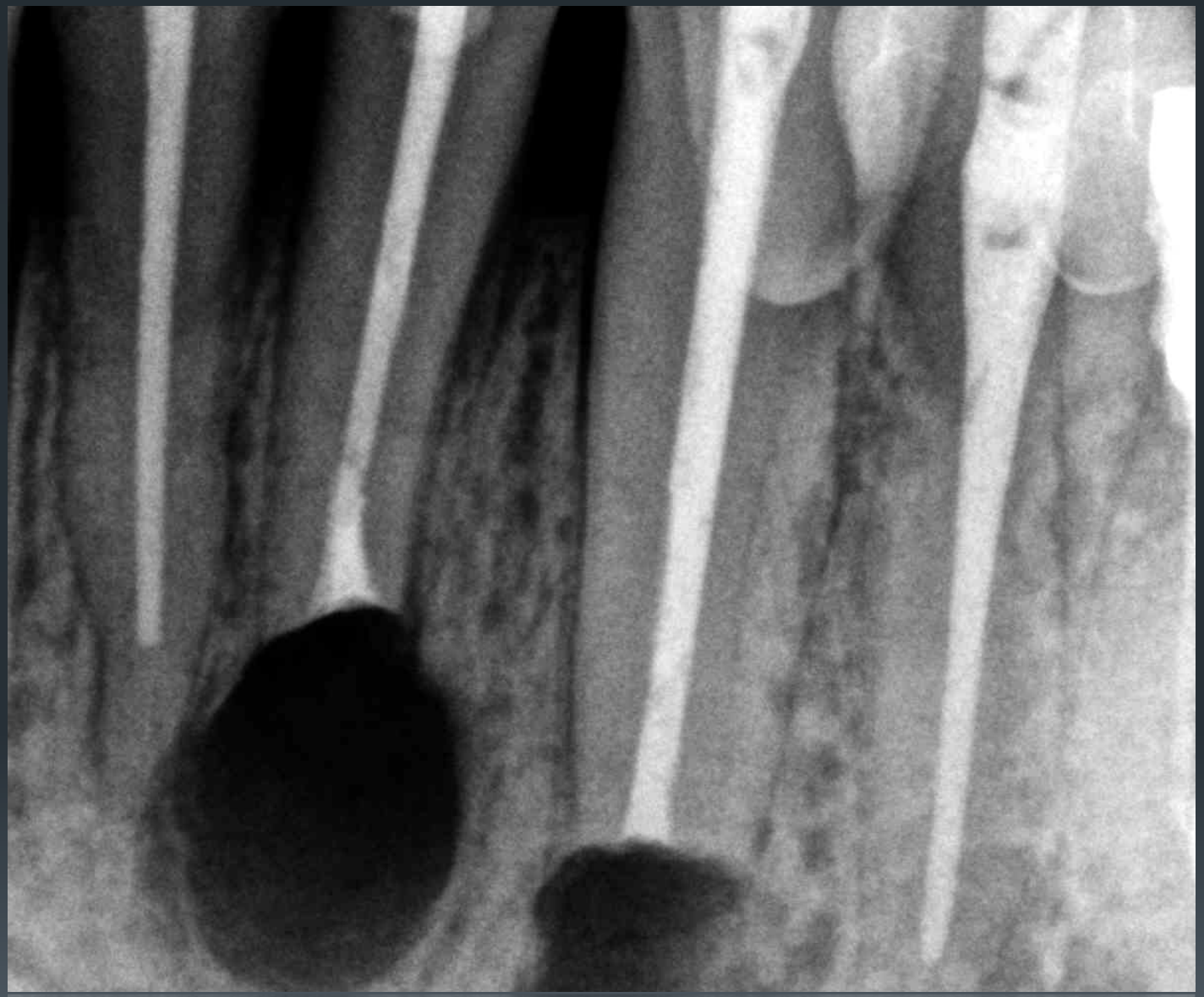
- The length measured is then transferred to the surgical field, determining the exact position of the root tip.Afterwards,with a round bur and a steady stream of saline solution, the bone covering the root tip is removed peripherally, creating an osseous window until the apex of the tooth is exposed .

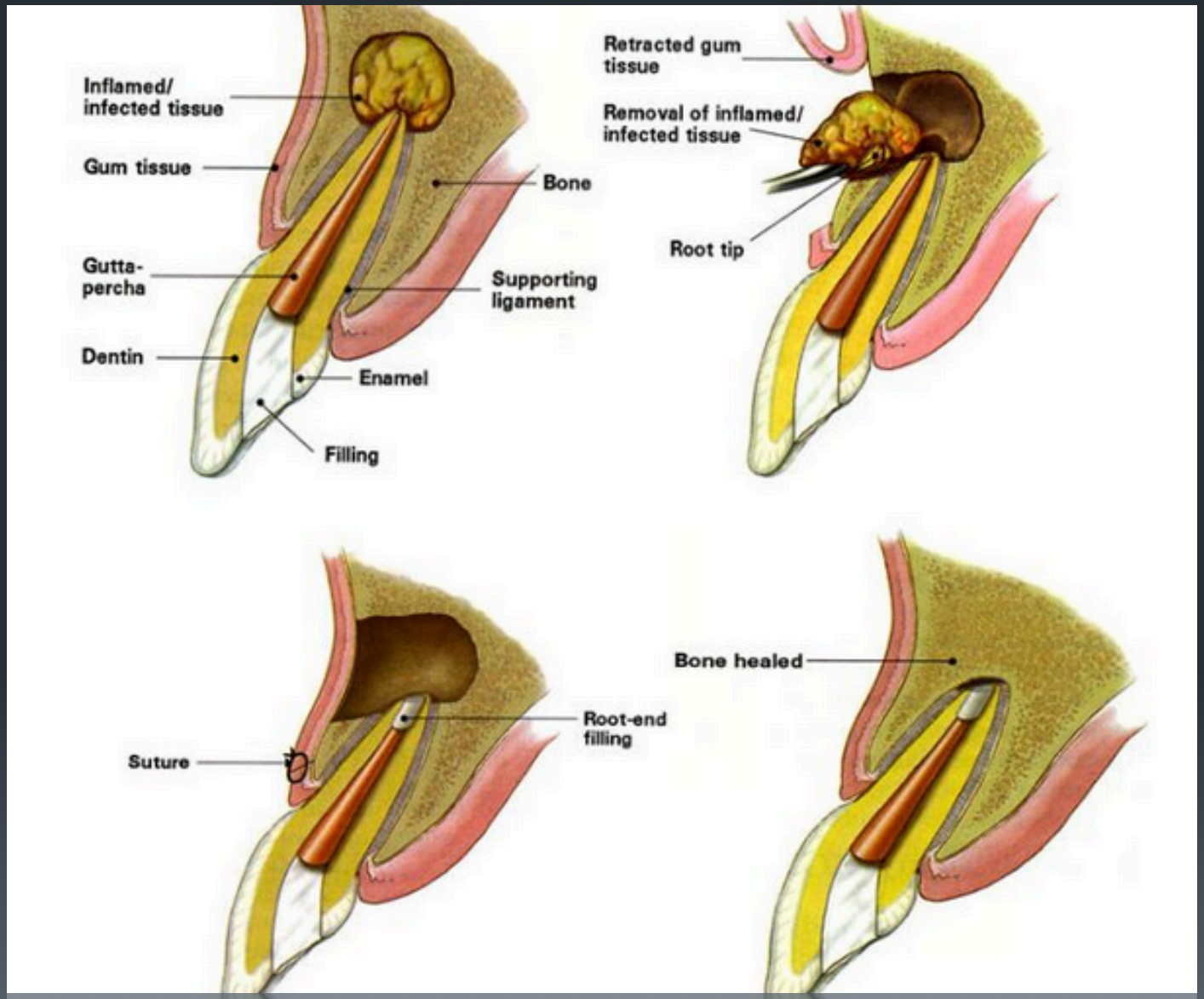
Resection of Apex of Tooth

I. The apex is resected (2–3mm of the total root length) with a narrow fissure bur and beveled at a 45° angle to the long axis of the tooth.

II. After this procedure, the cavity is inspected and all pathological tissue is meticulously removed by curettage, especially in the area behind the apex of the tooth.

III. If the entire root canal is not completely filled with filling material or if the seal is inadequate, then retrograde filling is deemed necessary.




Inflamed/
infected tissue
Gum tissue
Bone
Gutta-
percha
Supporting
ligament
Dentin
Enamel
Filling
Retracted gum
tissue
Removal of inflamed/
infected tissue
Root tip
Suture
Root-end
filling
Bone healed

Retrograde Filling

- After beveling of the apex and curettage of periapical tissues, gauze impregnated with adrenaline to minimize bleeding is placed in the bony defect.
- A micro head handpiece with a narrow round micro bur is then used to prepare a cavity approximately 2 mm long, with a diameter slightly larger than that of the root canal.
- After drying the bone cavity with gauze or a cotton pellet, sterile gauze is packed inside the bone deficit and around the apex of the tooth, in such a way that only the prepared cavity of the root end is exposed.
- The amalgam is placed inside the cavity with the miniaturized amalgam applicator and is condensed with the narrow amalgam condenser. The excess amalgam is carefully removed and the filling is smoothed with the usual instruments .

Wound Cleansing and Suturing of Flap

I. After placement of the amalgam, the gauze is carefully removed from the bony defect and, after copious irrigation with saline solution, a radiographic examination is performed to determine if there is amalgam splattering in the surrounding tissues.

II. The flap is repositioned and interrupted sutures are placed

Complications

The most common perioperative and postoperative complications that may occur during and after the surgical procedure, respectively, are:

1. Damage to the anatomic structures in case of penetration of the nasal cavity, maxillary sinus and mandibular canal with the bur.
2. Bleeding from the greater palatine artery during apicoectomy of palatal root.
3. Splattering of amalgam at the operation site, due to inadequate apical isolation and improper manipulations for removal of excess filling material
4. Staining of mucosa due to amalgam that remained at the surgical field (amalgam tattoo)
5. Healing disturbances, if the semilunar incision is made over the bony deficit or if the flap, after reapproximation, is not positioned on healthy bone.
6. Dislodged filling material due to superficial placement, as a result of insufficient preparation of apical cavity.
7. Incomplete root resection, due to insufficient access or visualization and misjudged length of root.As a result, the apical portion of the root remains in position and the retrograde filling is placed improperly.

Thank you……