

Exodontia

Dr. Ahmed Jan

Associate Professor, Consultant Oral & Maxillofacial Surgeon

Chairman, Oral and Maxillofacial Surgery Department

Faculty of Dentistry, KAU

Surgical operation involving bony and soft tissues of the oral cavity.

Access is restricted by lips and cheeks and complicated by movement of tongue and mandible.

Pharynx.

Largest number and variety of micro organisms.

Indication of extraction

1. Teeth involved with deep caries or severe abrasion which cannot be restored.
2. Severe periodontal disease with excessive destruction of supporting alveolar bone.
3. Apical pathological conditions such as abscess, granulomas or cysts when root canal or apicectomy is contra indicated.
4. Teeth interfering with stability and fitness of dental restoration such as dentures and bridges.
5. Teeth that are traumatizing soft tissue.

6. Malposed and crowded teeth that don't respond to orthodontic treatment.
7. Facilitate correction of malocclusion.
8. Impacted and unerupted teeth.
9. Supernumerary teeth.
10. Retained primary teeth.
11. Teeth with fractured root.
12. Roots and fragments.
13. Teeth involved in the fracture line.

Pre-Extraction Preparations

- Medical history and physical examination
Including vital signs
- Radiographic evaluation
What is an appropriate radiograph?
- Surgical plan
- Pain and anxiety control
- Patient and surgeon's preparations





Chair and Surgeon's Position

- Comfortable for both the patient and surgeon
- Stand during extraction.

Patient Position

The patient must be seated comfortably in the dental chair in order to gain his co-operation.

The back rest is fixed according to the patient's height.

The patient's head, neck and trunk should be in one vertical line.

The back and the head rest of the chair is adjusted so that when the patient open his mouth:

Maxillary occlusal plane is between 45 and 90 degree to the Floor and at the level of the operator's shoulder or 10 cm below that level.

Mandibular occlusal plane parallel or form 10 degree angle to the floor and at the level of the operator's elbow.

Position of the dentist

The operator should stand straight as possible.

Distributing his weight on both feet during his prolonged stand.

The operator stands in *front and to the right side* of the dental chair when extracting all the upper teeth and the *lower teeth on the left side*.

When extracting the lower teeth on the right side, the operator stands to the back right side of the dental chair.

It is better that the operator tilt the chair a little backward.

- 7 oclock position



- 12 o'clock position





Preparation before extraction

Oral cavity should be in best aseptic condition.

Remove all calculus deposits.

Rinse the mouth with antiseptic solution.

Discuss Risks and complications

Obtain Informed Consent

Soft tissue around the tooth is dried with sterile gauze.

Topical Anesthetic

Local Anesthetic

Time OUT !

Wrong Tooth Extraction

The extraction of a tooth other than the one intended by the referring dentist.

One of the major reasons for filing malpractice claims against oral and maxillofacial surgeons.

The most common causes include cognitive failure and miscommunication.

- Partially erupted teeth mimicking third molars,
- Multiple condemned teeth
- Teeth with gross decay.

- The Joint Commission Board of Commissioners approved the Universal Protocol for Preventing Wrong Site, Wrong Procedure and Wrong Person Surgery in July 2003, and it became effective July 1, 2004

Protocol

- Preoperative verification process.
- Marking the operative site.
- “Time out” immediately before starting the procedure.

- 2009, the world health organization (WHO) published guidelines for safe surgery including a surgical safety checklist.
- Many institutions adapted this checklist, and modified it to be applicable for oral surgeries, including extractions.

Surgical Safety Checklist



World Health
Organization

Patient Safety

A World Alliance for Safer Health Care

Before induction of anaesthesia

(with at least nurse and anaesthetist)

Has the patient confirmed his/her identity, site, procedure, and consent?

- Yes

Is the site marked?

- Yes
 Not applicable

Is the anaesthesia machine and medication check complete?

- Yes

Is the pulse oximeter on the patient and functioning?

- Yes

Does the patient have a:

Known allergy?

- No
 Yes

Difficult airway or aspiration risk?

- No
 Yes, and equipment/assistance available

Risk of >500ml blood loss (7ml/kg in children)?

- No
 Yes, and two IVs/central access and fluids planned

Before skin incision

(with nurse, anaesthetist and surgeon)

Confirm all team members have introduced themselves by name and role.

Confirm the patient's name, procedure, and where the incision will be made.

Has antibiotic prophylaxis been given within the last 60 minutes?

- Yes
 Not applicable

Anticipated Critical Events

To Surgeon:

- What are the critical or non-routine steps?
 How long will the case take?
 What is the anticipated blood loss?

To Anaesthetist:

- Are there any patient-specific concerns?

To Nursing Team:

- Has sterility (including indicator results) been confirmed?
 Are there equipment issues or any concerns?

Is essential imaging displayed?

- Yes
 Not applicable

Before patient leaves operating room

(with nurse, anaesthetist and surgeon)

Nurse Verbally Confirms:

- The name of the procedure
 Completion of instrument, sponge and needle counts
 Specimen labelling (read specimen labels aloud, including patient name)
 Whether there are any equipment problems to be addressed

To Surgeon, Anaesthetist and Nurse:

- What are the key concerns for recovery and management of this patient?

Management of Wrong Tooth Extraction

- Inform the patient immediately when the error has been identified.
- Determine the options for tooth replacement, discuss those options with the referring dentist, and then advise the patient in a solution-oriented manner.

Uncomplicated Exodontia.

Extraction by the use of forceps and elevator or both.

The blades of these instruments are forced down the periodontal membrane, between the bony socket and the tooth root.

Complicated Exodontia.

Flap Reflection, bone removal, sectioning of multirooted teeth

| Blade | Shank | Handle |



Periosteal elevator



Used to sever gingival fibers connection to teeth.

Apply force to base of gingival sulcus to crest of bone to sever gingival fibers

Dial's periosteal elevator :

This has one rounded edge and one pointed end.

The pointed edge is used to detach the papilla while the rounded edge to reflect the mucoperiosteal flap and small flaps.

Extraction Forceps

- Extraction forceps are designed to deliver teeth from the socket.
- ✓ Each forceps has 2 handle, 2 beaks and one joint.

Requirement of the forceps

The metal of the forceps should resist bending or breakage (i.e. strong), and resist rusting during sterilization by the autoclave.



The handles

The handle have a cross hatching to allow a firm grip .

- ✓ The handle must possess a suitable size to rest comfortably in the operator's hand.
- ✓ Must be long enough to afford use of strong steady extraction movements.
- ✓ Must have a suitable shape and design to suit the area of the extracted tooth without injury to the soft tissue.

A firm grip is established prior to giving any force movement.

The blades

- ✓ have serrations on the inner side of the beaks to allow better grip on the tooth.
- ✓ Must be sharp to be introduced under the free gum margin towards the root surface.
- ✓ Ideally the forceps blades should fit the root surface.
- ✓ The forceps beaks are applied along the long axis of the tooth, below Cemento-enamel junction of the tooth.

✓

Joint

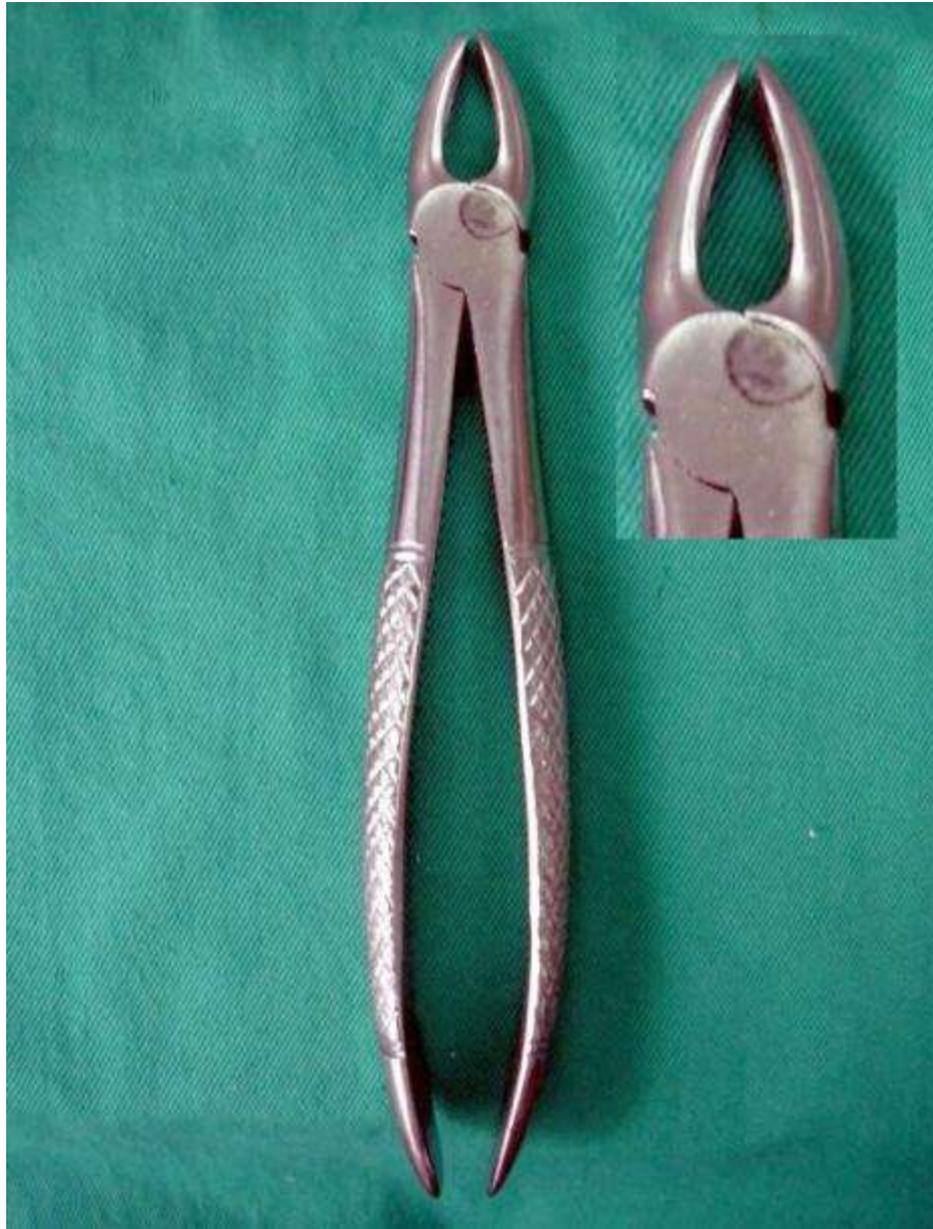
Heavy and strong.

Must have free movement in order to move the forceps easily, but should not have any rolling movement.

Maxillary Anterior Forceps

- They have identical beaks that are closed, straight, flat and broad.
- ✓ They are used to extract the maxillary incisors and canines.

Anterior forceps



Maxillary Premolar Forceps

- - ✓ They have identical beaks that are concave on the side of facing the operator.
 - ✓ The beaks are broad and open.
 - ✓ They are used for extraction of premolars.
 - ✓ The curvature of the blade is to access the premolars placed posterior in the arch





Maxillary Molars (Right and Left)

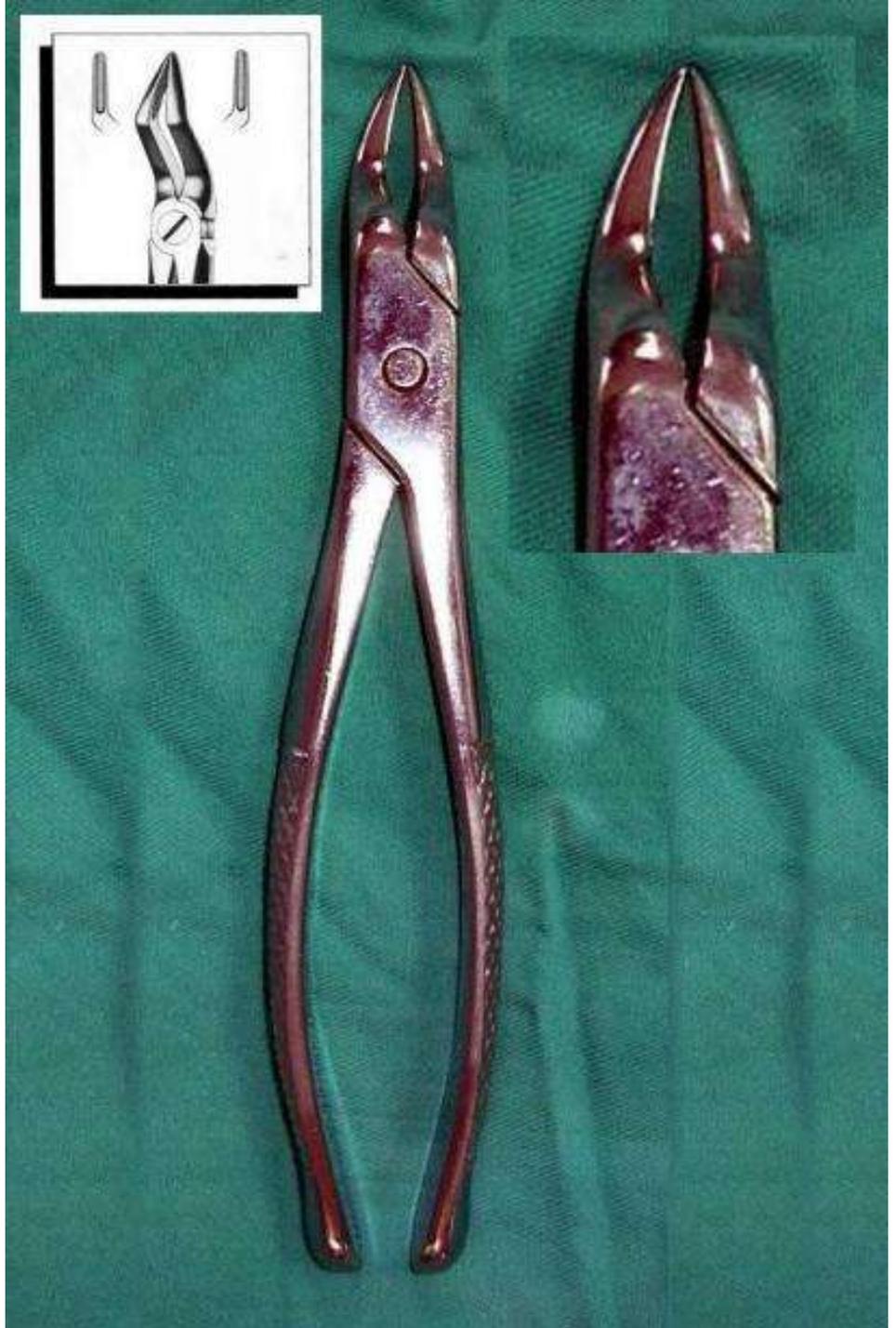
- The beaks of these forceps are not identical. One beak is rounded and other one is Pointed.
- ✓ The pointed beak engages the groove between the buccal roots and the rounded one engages the palatal surface below cemento-enamel junction.
- ✓ The beaks also have curvature to the side facing operator.
- ✓ When viewed, if the pointed beaks to the left of the operator it is right sided forceps and vice versa.



Bayonet Forceps

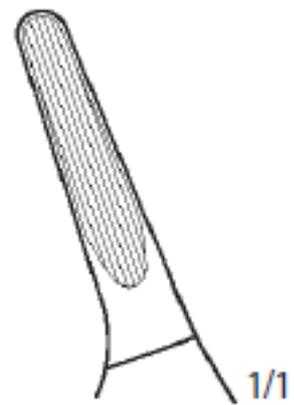
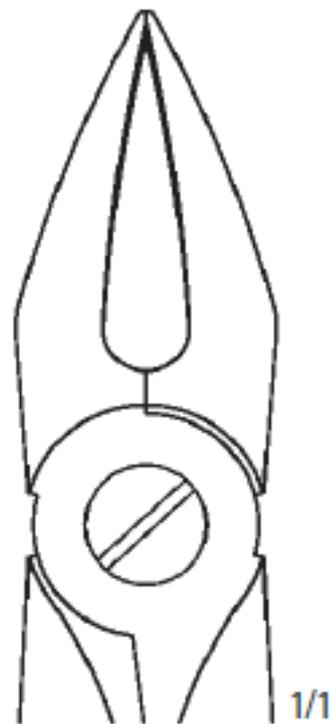
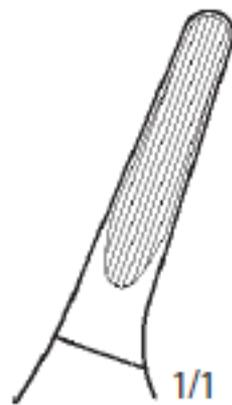
- ✓ They have identical, pointed, angulated and closed beaks. The length of the beaks vary from long to short.
- ✓
 - According to the thickness of the beak they can be classified into thick beaks and thin beak bayonet forceps.
 - The thick beak forceps is used to remove maxillary posterior root stumps that are not separate, while the thin beak forceps are used to remove single roots.

- Bayonet Root Forceps





Bayonet Crown Forceps







Mandibular Anterior Forceps

- The mandibular anterior forceps have identical broad, short, closed beaks.
- The joints is a rivet joint unlike most forceps have box joint.
- ✓ They are used for extraction of mandibular anterior teeth.



Mandibular Premolar Forceps

- ✓ The mandibular premolar forceps have identical broad open beaks that are longer than the beaks of the anterior forceps.
- ✓ They are used for extraction of mandibular premolar teeth.



Mandibular

Molar

Forceps

- They have identical, broad, open beaks that are longer than the beaks of anterior forceps.
- ✓ They are used for extracting mandibular molar teeth.





Mandibular root forceps

- These forceps have identical, slender beaks that are closed. The beaks are longer than that of the premolar forceps to enable the forceps to take a deep grip on the root stumps of all the mandibular teeth.





Handwritten text, possibly a signature or initials, located to the right of the forceps.

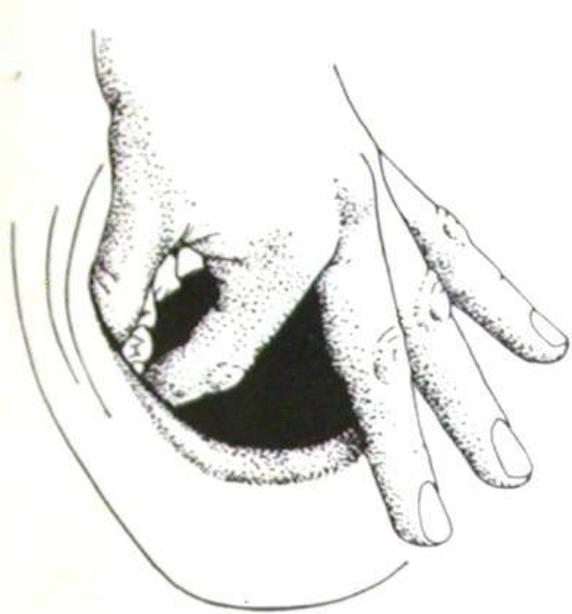


Mandibular Cowhorn Forceps

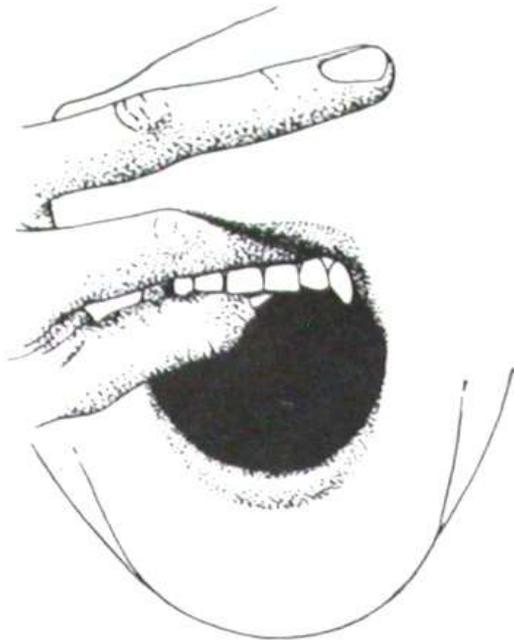
- It has identical, open, beaks that resemble the horn of the cow. The beaks are round and taper to the point.
- ✓ The forceps grips the tooth at the furcation between the mesial and distal roots.
- ✓ When pressure is applied and the beaks are closed, the tooth is luxated or literally squeezed out of the socket, using buccal and lingual plates as the fulcrum.
- ✓ They are used to remove grossly carious mandibular molars with extensive destruction of the crown.

Retraction and Support





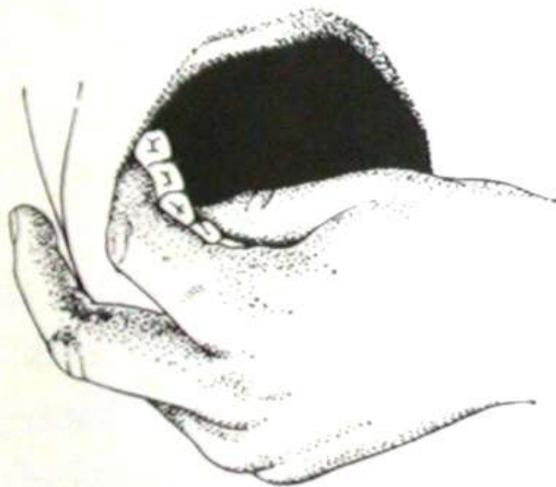
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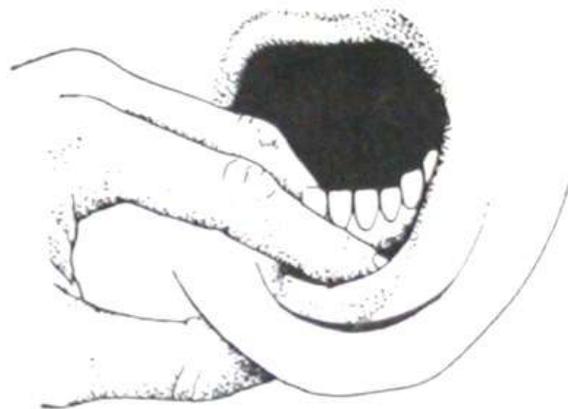
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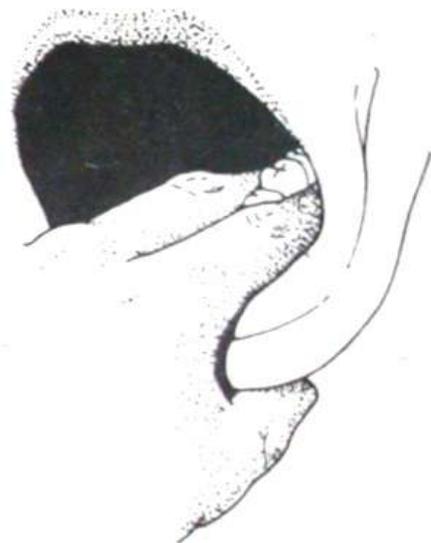
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D



E



F













Function of the left hand

1. Reflect the soft tissues of the cheeks, lips and the tongue to provide adequate visualization.
2. Protect the other teeth from the forceps (in case of its sudden release).
3. Stabilize the patient's head during the procedure.
4. support and stabilize the mandible.
5. Support the alveolar process and provides tactile information to the operator concerning expansion of the alveolar process.

The Mechanical Principles of the Extraction





1. Expansion of the bony socket. (bone must be elastic)( in young age,  old age).
2. The use of a lever and fulcrum to force a tooth or root out of the socket along the path of least resistance.

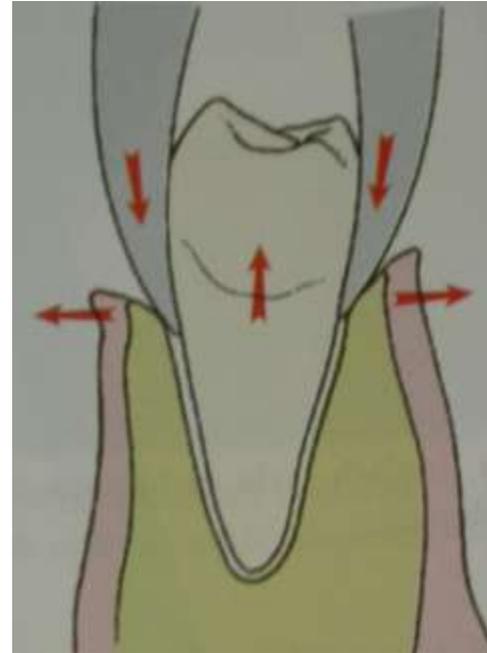
Mechanical principle of extraction

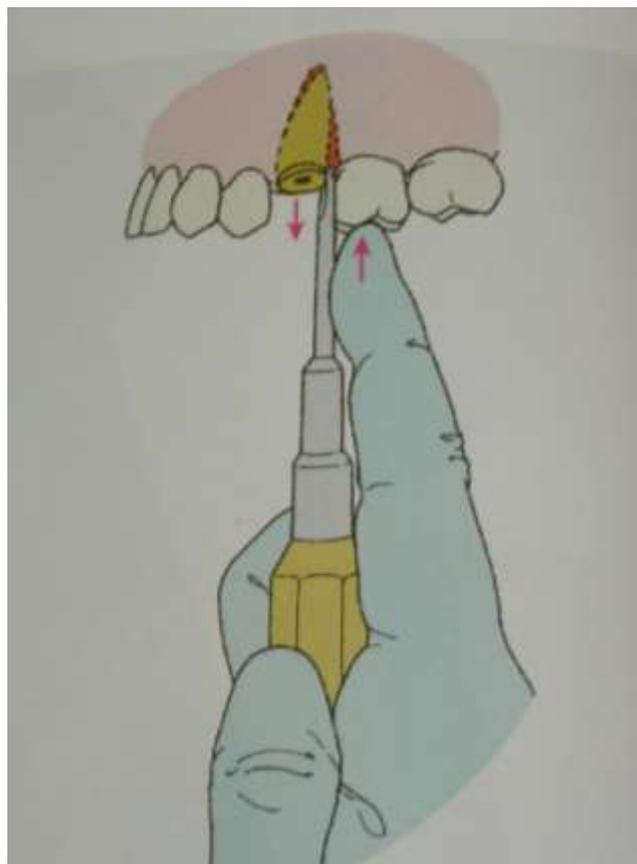
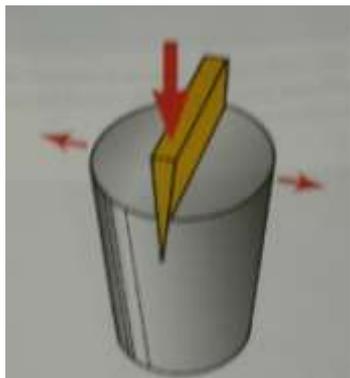
Socket Expansion

Grasp

Lever and fulcrum

Deliver through the path of least resistance





Major movements applied by the
forceps

1. Apical pressure which causes:

- a) Expansion of the socket (Crestal Bone) caused by insertion of the beaks down into the periodontal ligament .

- b) The center of rotation is displaced apically. The chance of apical root fracture.

2. *Buccal pressure* result in:

a) Expansion of the buccal plate (crest of the ridge).

b) Lingual apical pressure.

3. *Lingual and Palatal Pressure:*

aimed to expand the linguocrestal bone .

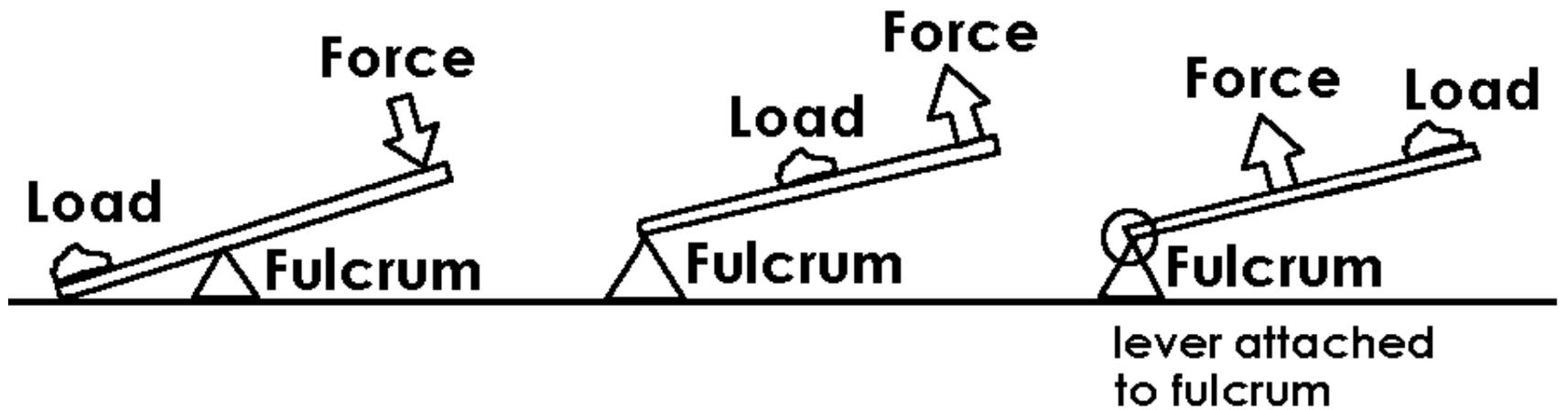
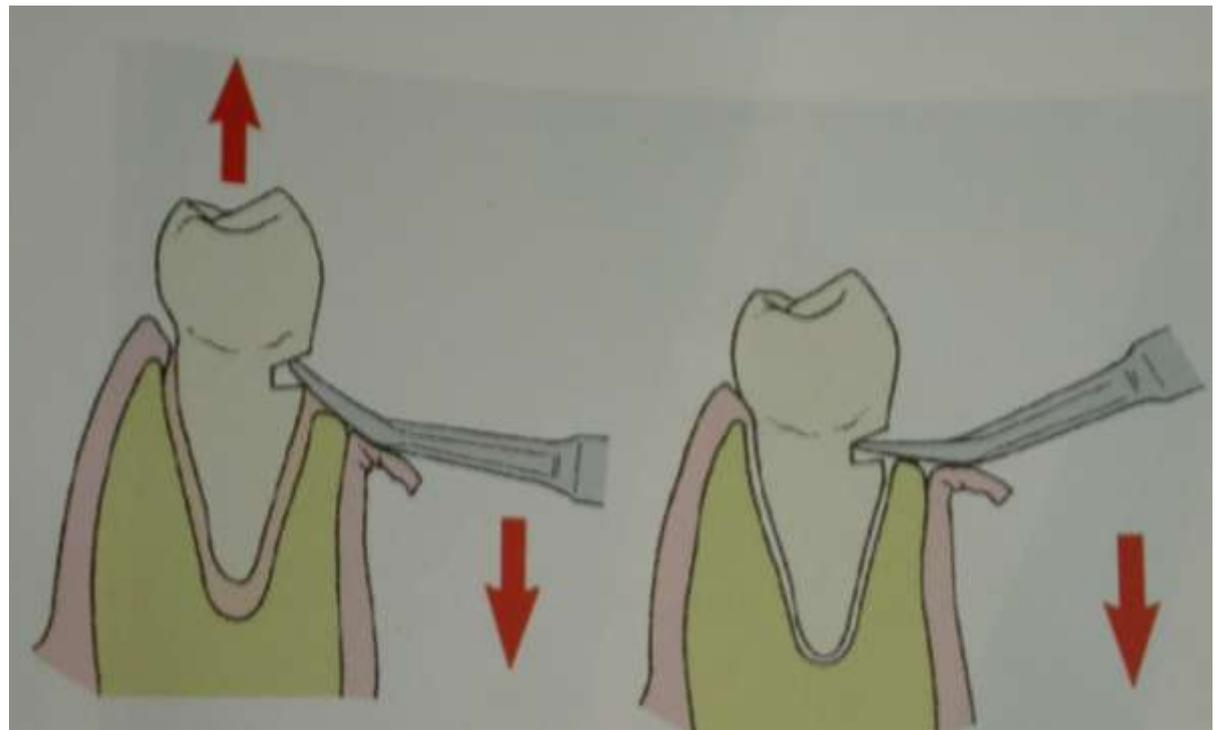
4. *Rotational Pressure*

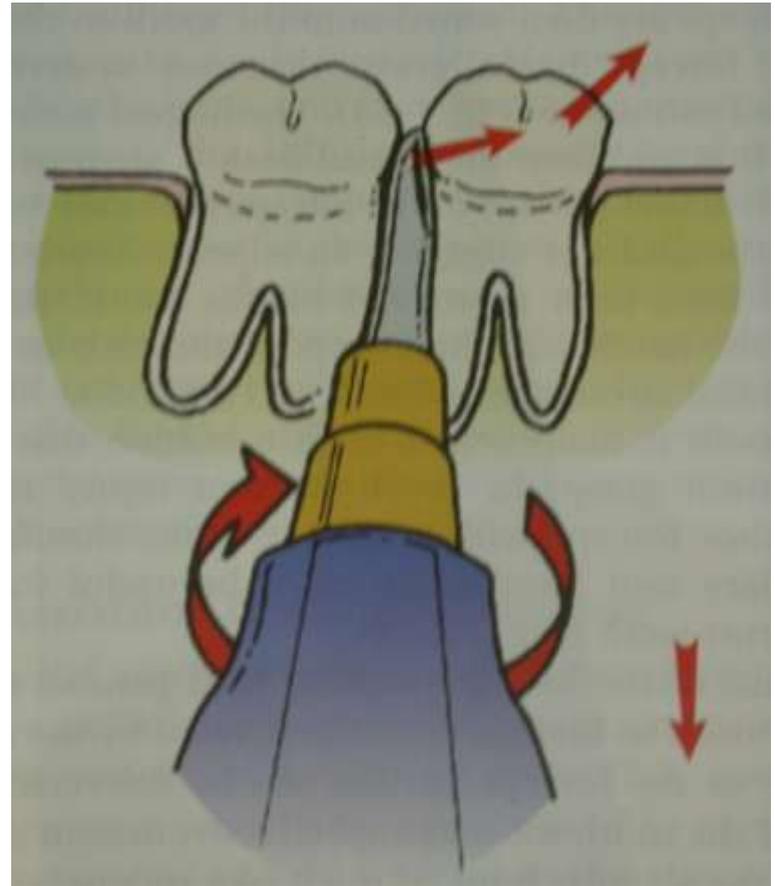
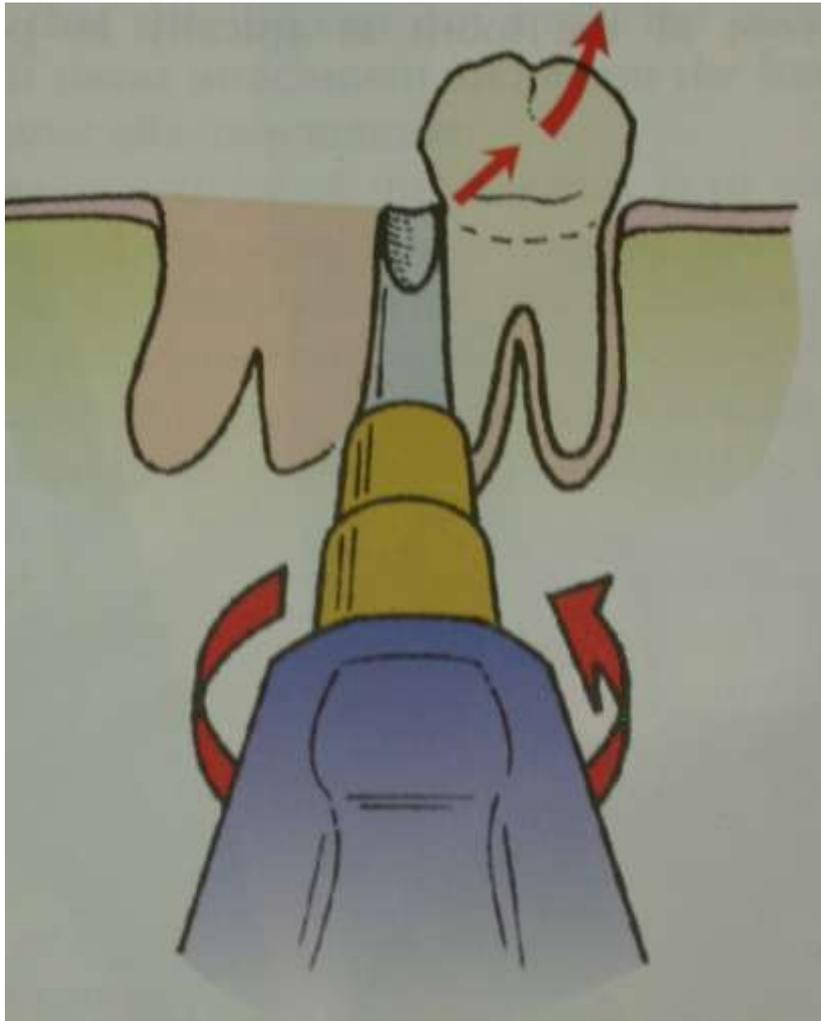
Around the long axis of the tooth.

5. *Tractional Force*

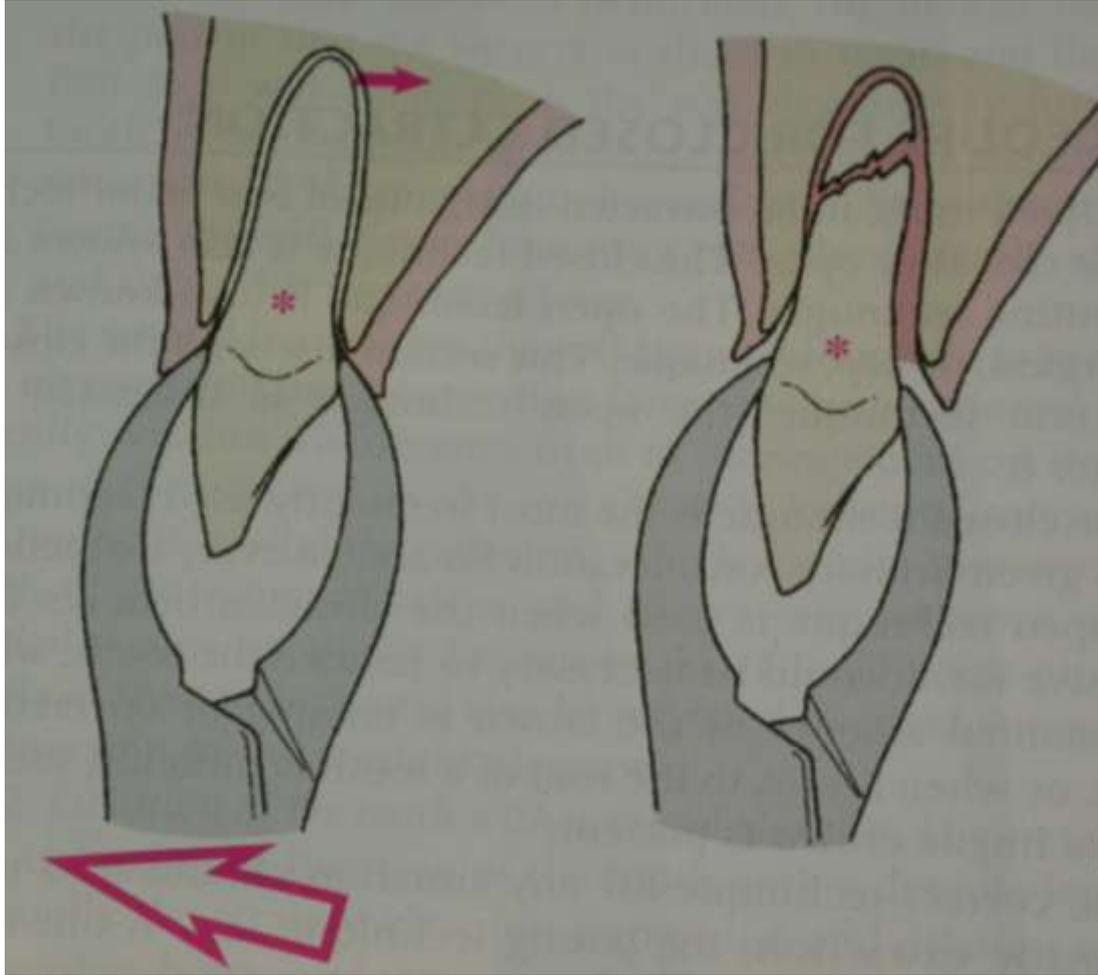
Used for delivering the tooth from the socket.

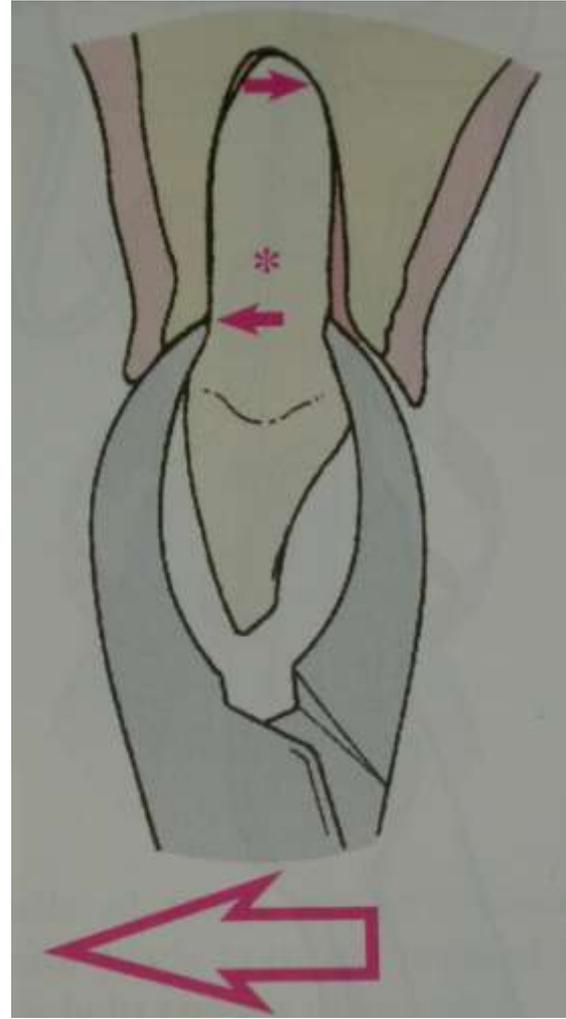
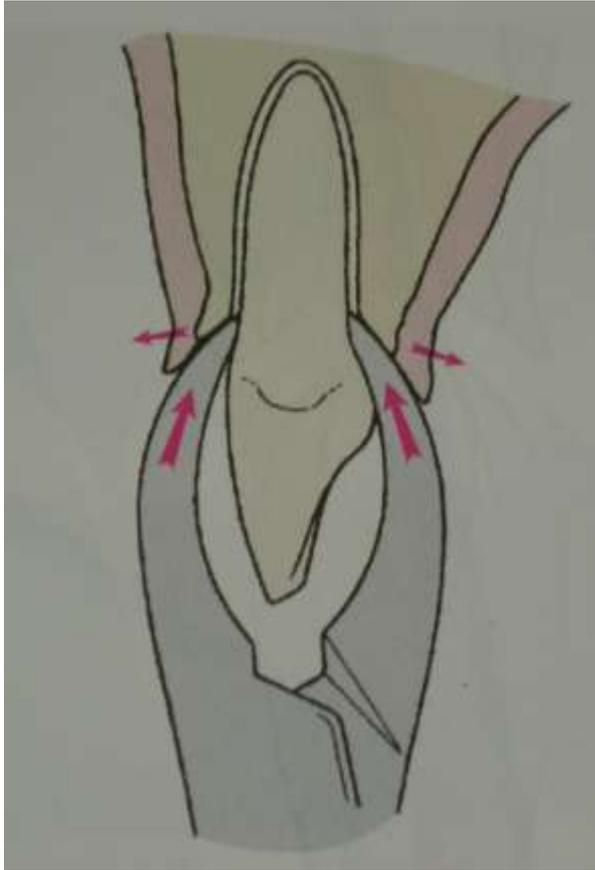
Limited to the final portion of the extraction process.

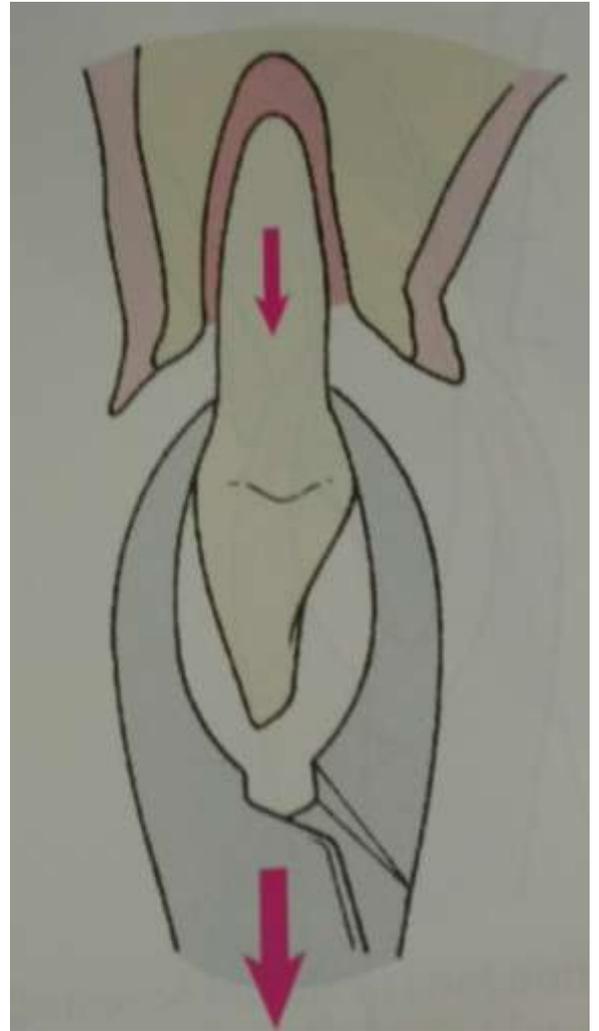
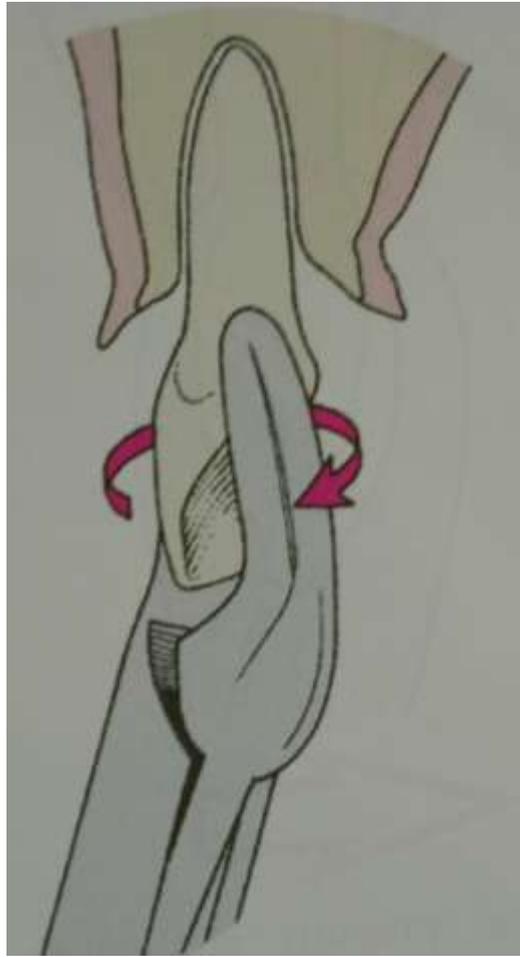
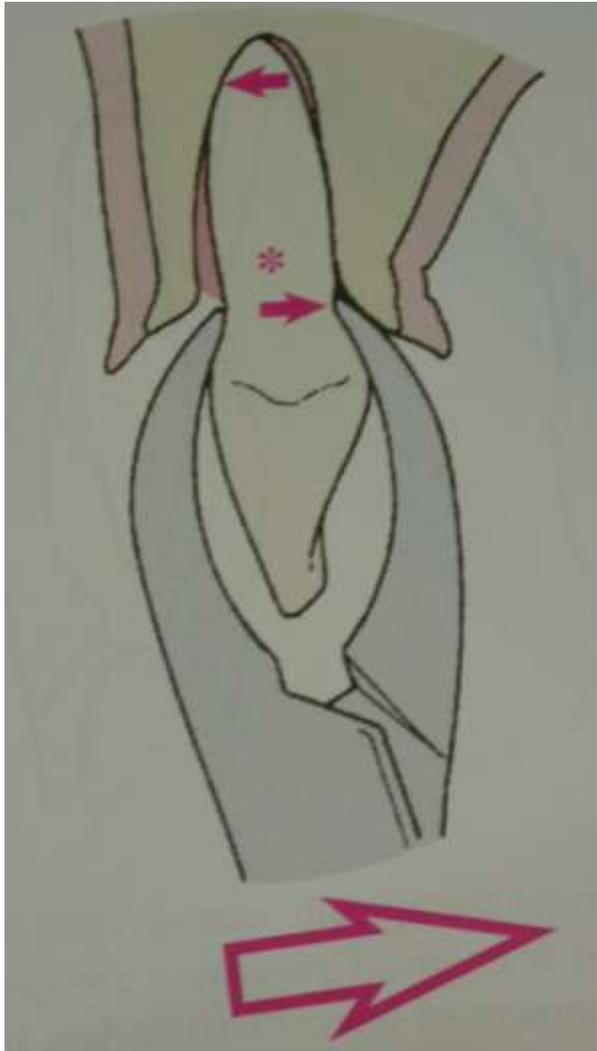




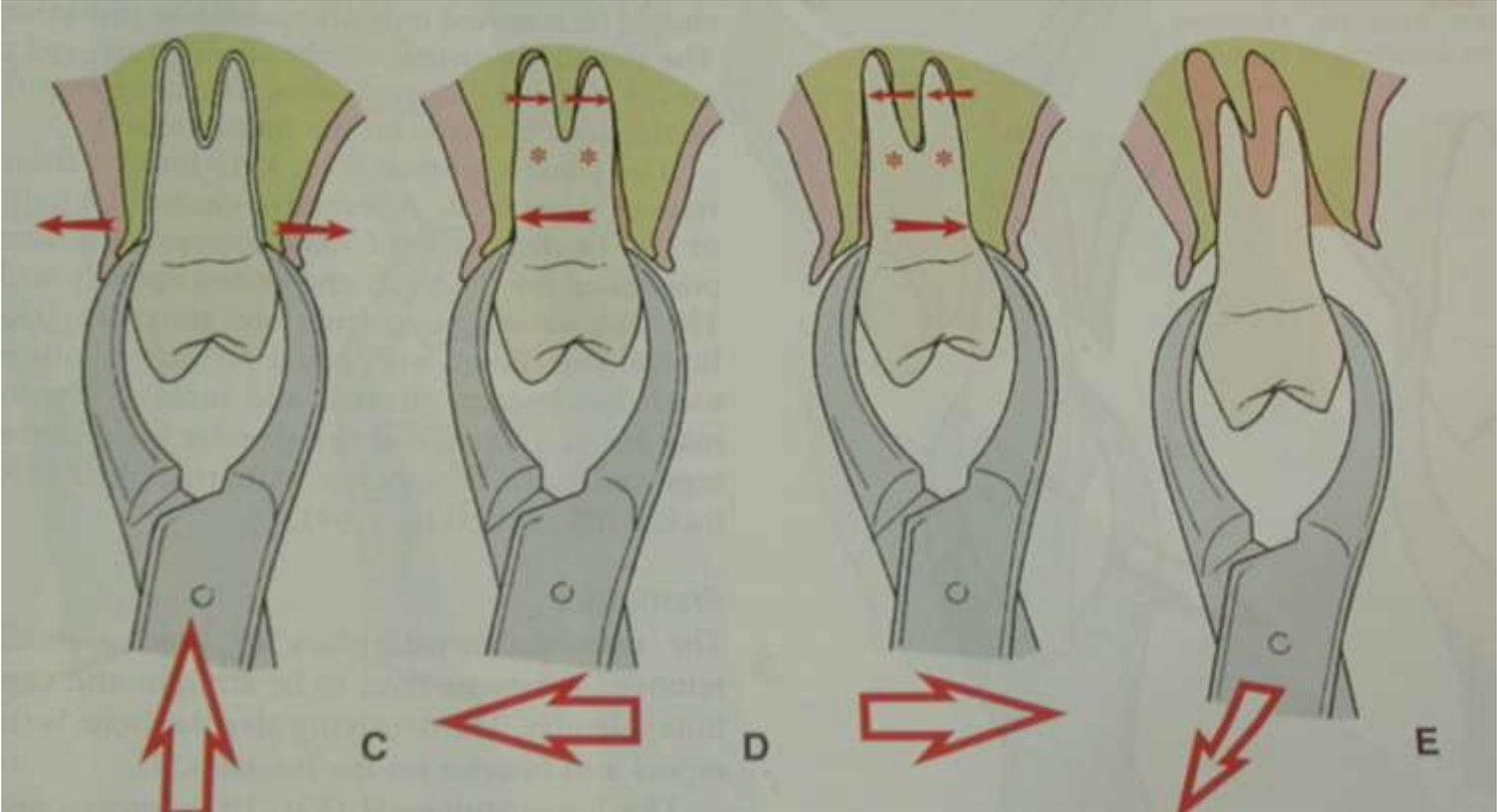


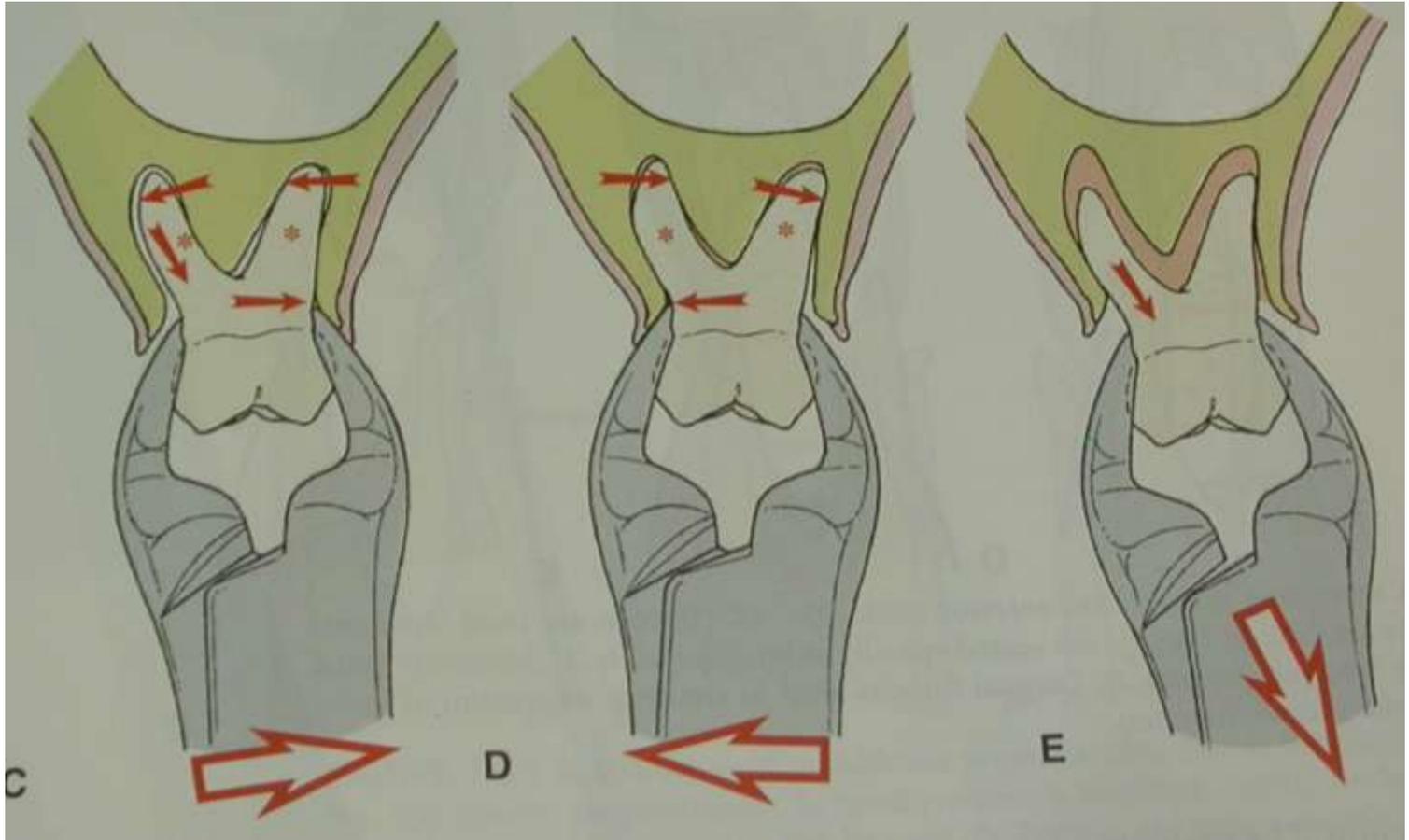


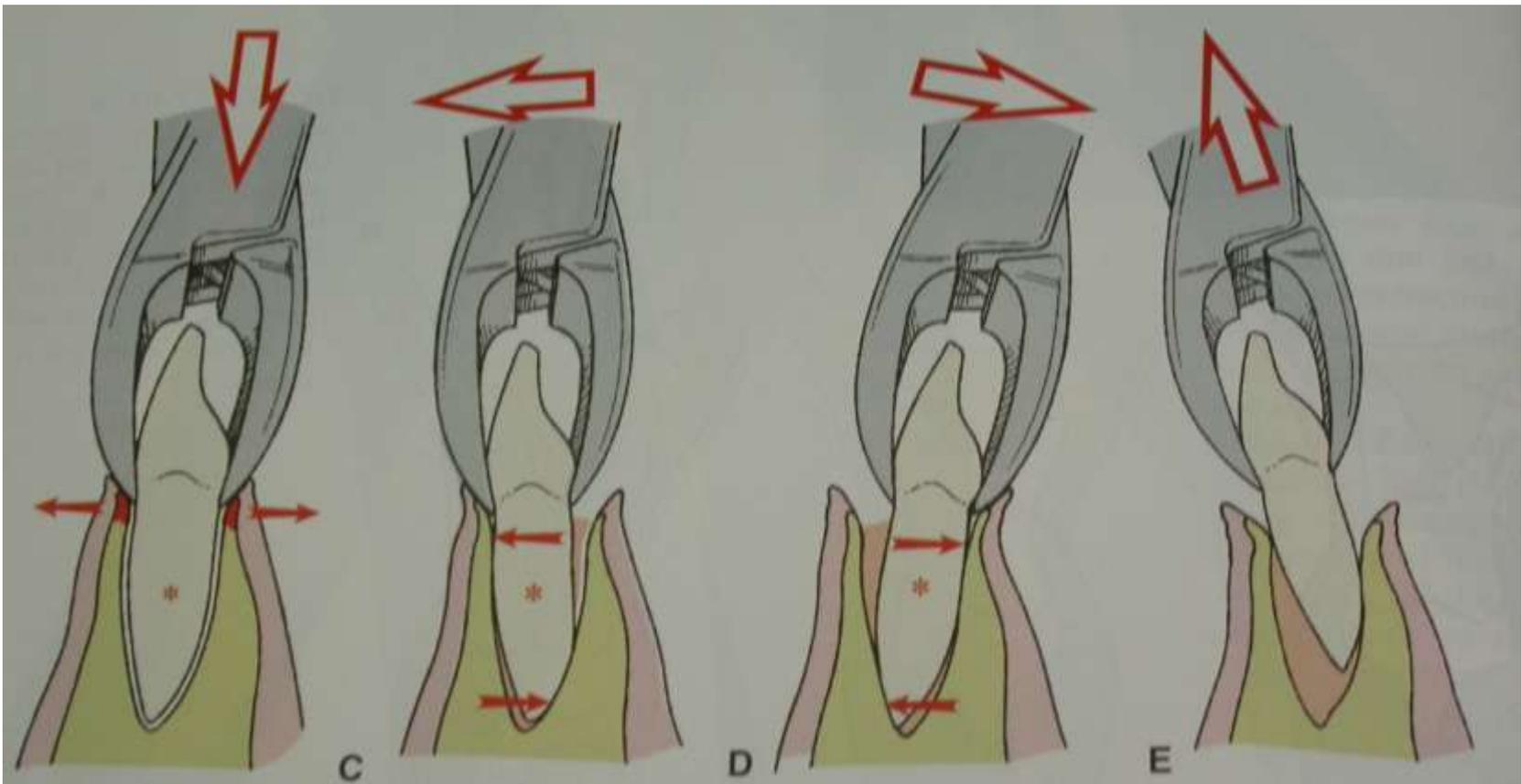


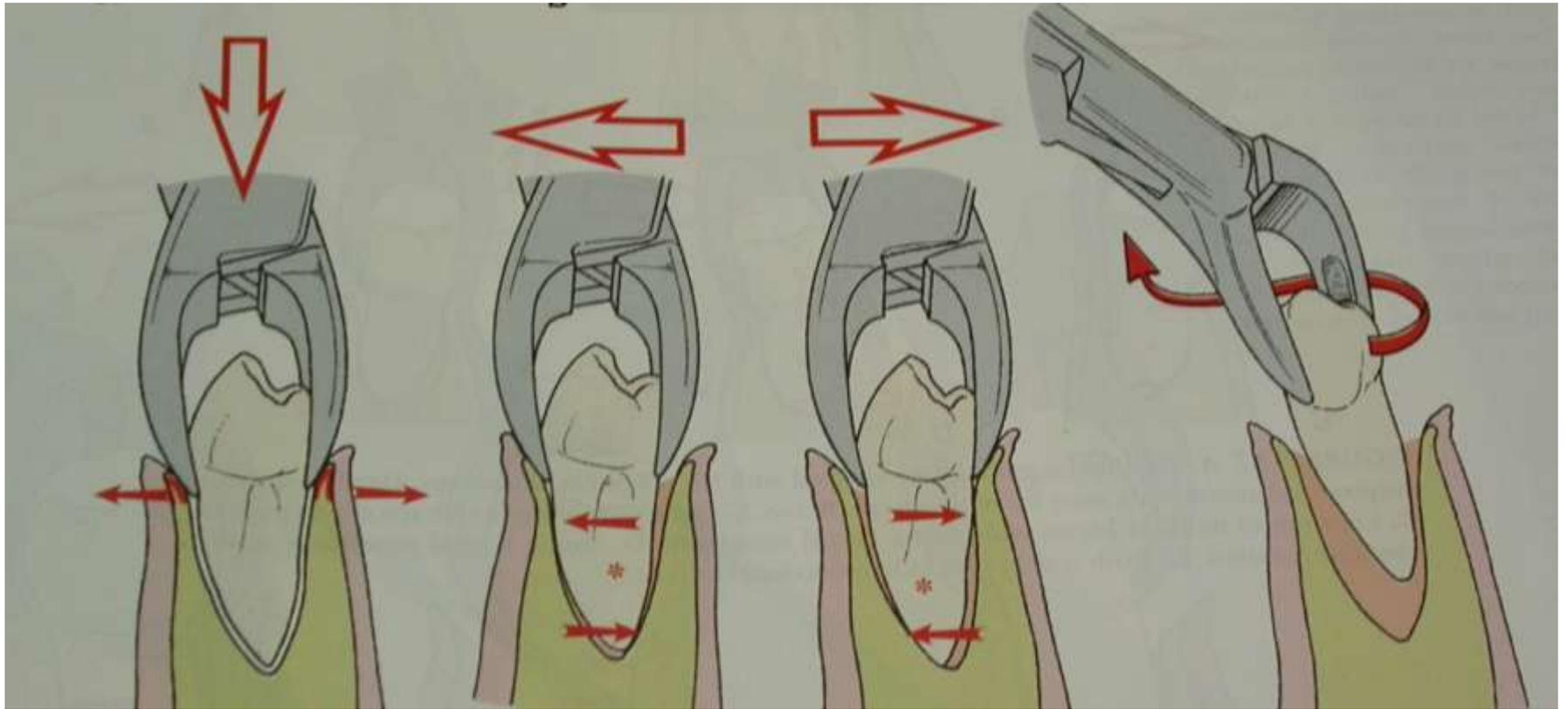












Procedure for Closed Extraction

- A mouth prop is used to stabilize the mandible for mandibular procedures





- 1. Loosening of soft tissue attachment from the cervical portion of the tooth.***
- 2. Luxation of the tooth with dental elevator.***
- 3. Adaptation of the forceps to the tooth.***
- 4. Luxation of the tooth with forceps .***
- 5. Removal of the tooth from the socket.***

Loosening of soft tissue attachment from the cervical portion of the tooth.

Allows the surgeon to ensure that a profound anesthesia has been achieved.

Allows the beaks of the forceps to be placed more apically.

Luxation of the tooth with dental elevator.

In case the patient has no posterior tooth to the tooth being extracted.

Adaptation of the forceps to the tooth.

The blades must be placed in the center of the tooth.

The blades must be placed parallel to the long axis of the tooth.

The lingual beak is placed first.

Make sure that the blades are placed apically below the CMJ and not engaging the soft tissue.

Luxation of the tooth with forceps.

Major portion of the force is directed apically .

Slow steady force.

No jerky movements.

Directed toward expansion of the bone and disruption of PDL.

Removal of the tooth from the socket.

Once alveolar bone has expanded and the tooth has been luxated, a slight traction force, usually directed buccally , can be used.

Traction COMES AFTER LUXATION

Reasons for root breakage:

1. Use of wrong forceps.
2. The teeth are brittle because they are non-vital.
3. Improper application of forceps.
4. Incorrect force application (use of twist or pulling force when not indicated).
5. Aberrant anatomical reasons such as curved roots, hypercementosis, supernumerary roots, isolated tooth.
6. The presence of some bony lesions such as dense bone island.

Maxillary central incisor:

It has a single conical root.

The labial alveolar bone is thinner than the palatal alveolar bone.

The root have some relation to the floor of the nasal cavity.

Maxillary lateral incisor:

Single flattened root .

The labial alveolar plate of bone is thicker than that present in the central incisor, but it is still thinner than the palatal alveolar plate.

Maxillary canine:

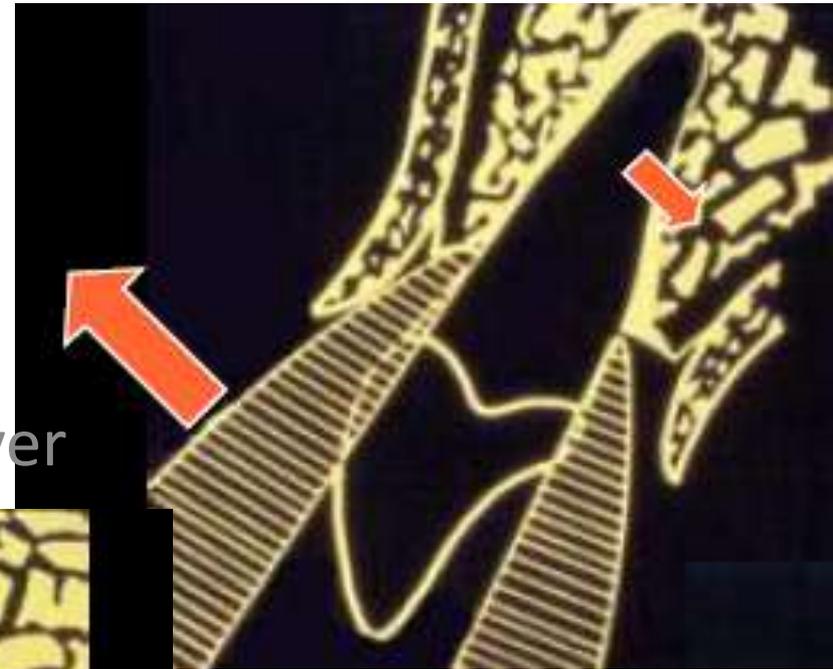
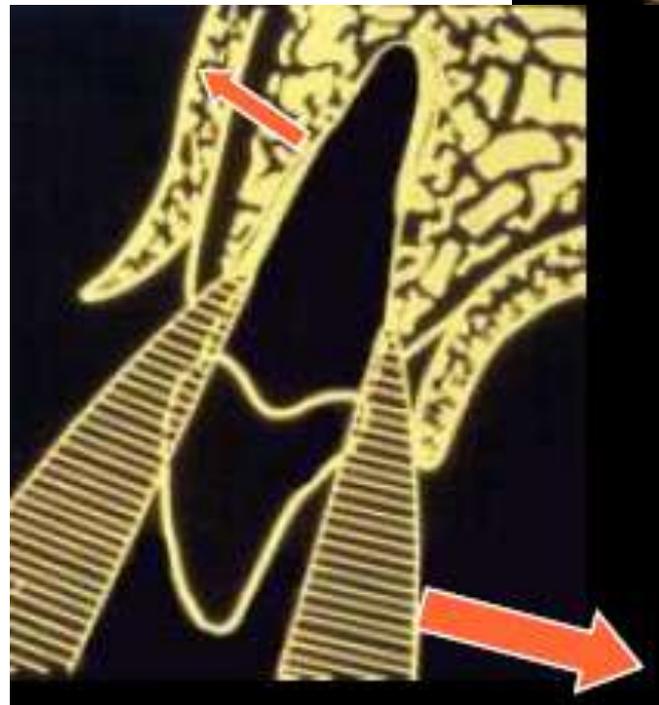
The root is single, the longest and the strongest of all teeth.

The labial plate is thinner than the palatal plate.

Anterior tooth technique (*most cases*)

Roots of teeth mostly cylindrical

- Luxate first to facial
- Then luxate to lingual
- As tooth loosens, rotate and deliver



Maxillary central incisor:

Mainly rotation toward the mesial first then toward the distal.

Maxillary lateral incisor:

Rotational movement is limited because of the distal root curvature with a small amount of tractional force.

Maxillary canine:

Try to avoid labial alveolar bone fracture.

Maxillary first premolar:

85% has two roots, buccal and palatal. 15% are single rooted.

The buccal cortical plate is thinner than the palatal bone.

This tooth may have relation to the maxillary sinus.

The most common tooth liable for fracture.

Palatal movement must be minimal.

Palatal root is the most liable for fracture.

Traction force in occlusal direction and slight buccal.

Maxillary second premolar:

Single rooted (in 85% of the cases), rarely it is bifurcated.

It has more intimate relation to the sinus than the first premolar.

Heavy palatal alveolar palate.

Maxillary first and second molar:

Each has three roots, mesiobuccal, distobuccal and palatal root.

The roots are straight, but may be divergent causing some resistance in extraction.

Buccal bone is thin and the palatal plate is thick and heavy.

Buccal movement first.

Buccal force more than palatal.

They have close relationship to the sinus and sometimes the sinus mucosa is the only structure between the apices of the teeth and the sinus floor, or the roots may extend into the sinus.

Maxillary third molar:

The shape and roots of this tooth greatly vary.

It may have three roots, fused roots, accessory roots.

Distal to that tooth lies the maxillary tuberosity which may break if excessive force is used during extraction.

Mandibular central and lateral incisor:

The roots of both teeth are single and straight.

Distal curvature may be present.

The bone is thin on the labial and the lingual side.

Movements are in labial and lingual direction with equal pressure.

Mandibular canine:

The root is single, short and weaker than the maxillary one.

The bone is thicker on the lingual side.

More labial force than lingual force.

Mandibular first premolar:

Single rooted and the outer cortex is thinner than the inner cortical plate.

Mandibular second premolar:

The root is single, straight and cylindrical.

Mental foramen lies close to the apices of the two premolar.

Mandibular first and second molars:

They have two roots, a mesial and a distal one. Mesial root tend to curve distally in its apical third.

The socket of the second molar is thinner lingually than buccally. Use lingual movement first and more lingual force than buccal force.

Mandibular third molar:

Vary in root numbers. The roots may be single or multiple.

The shape of the alveolar process is similar to that of the second molar.

The inferior alveolar canal is in close relationship to that tooth.

Use straight elevator first (preferred) for luxation, then use more lingual force than buccal.

This tooth is usually impacted in the jaw.

Extraction of primary teeth

- Great deal of care (roots are thin and liable for fracture).
- Apply the forceps apically.
- Slow steady buccal and palatal movements.



After extraction

1. Check for root fracture.
2. Irrigate socket with saline.
3. Evaluate the need for curettage.
4. Evaluate the need for bone filing
5. Evaluate need for suture.
6. Use finger pressure to compress expanded alveolar bone.
7. Place slightly moistened gauze over socket and apply pressure.

Instructions to patient

1. Instructions for pain meds
2. Apply pressure to gauze for one hour.
3. Change pressure gauze once an hour.
4. No spitting, No rinsing for 24 hours
5. Avoid hot weather, hot drinks for 24 hours
6. Mouth rinse after 24 hours
7. No drinking through straw
8. No Smoking
9. Prescription
10. Include phone number in case of concerns

Healing

- ***After 24 hours***
- Bleeding should stop.
- Discomfort started to subside.
- Gum near the socket is tender.
- Some swelling peak to the next 24 hours and then subside.

Week 1 and 2

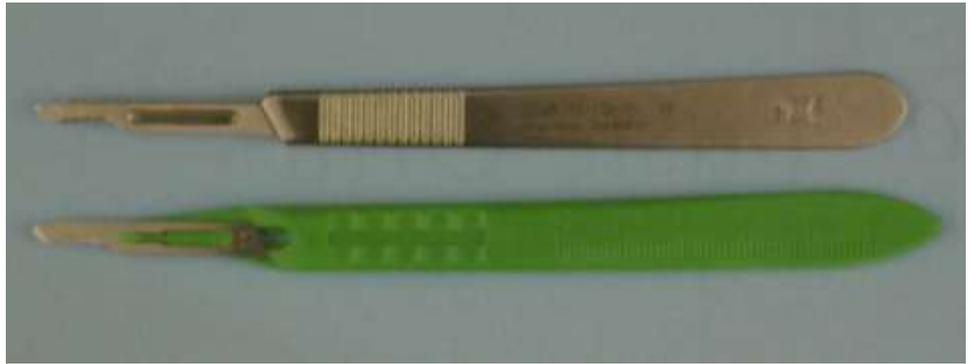
- Gum reached a significant amount of healing (7-10 days).
- The healing process is vascular in nature, trauma within this period may cause bleeding.

Weeks 3 and 4

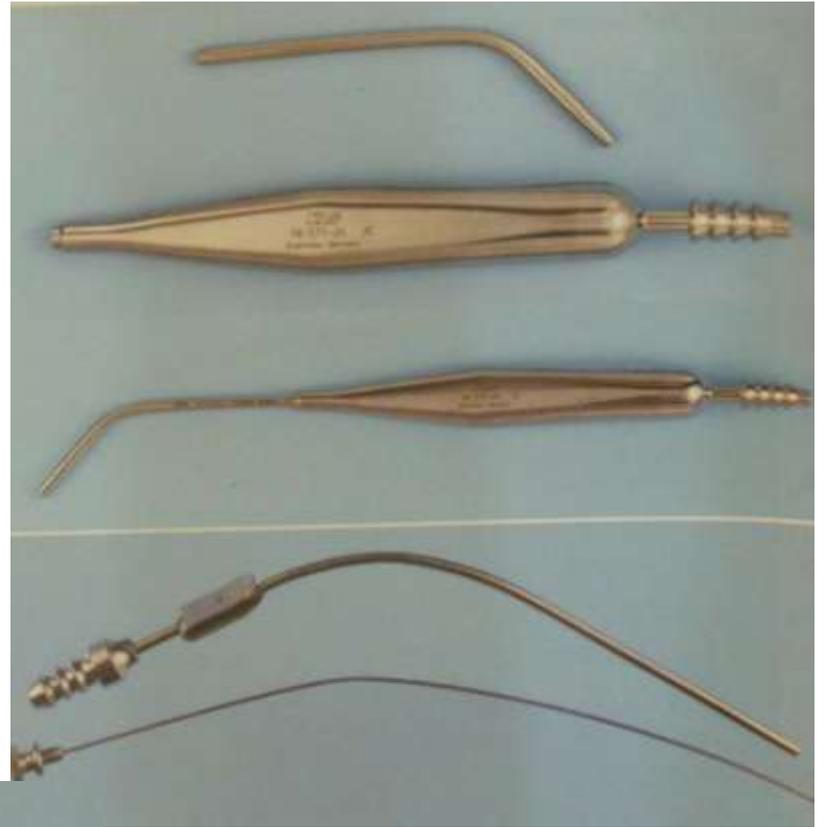
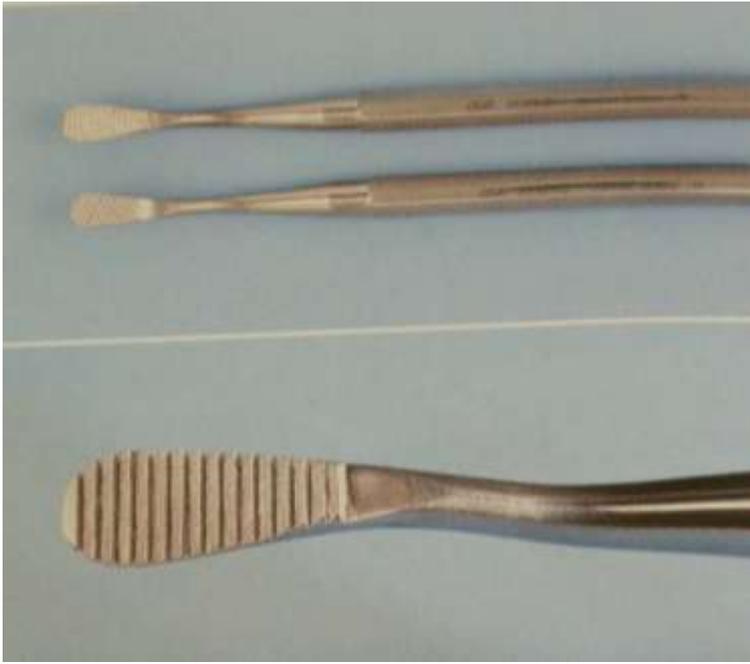
- Most of the soft tissue healing took place.
- New gum tissue.

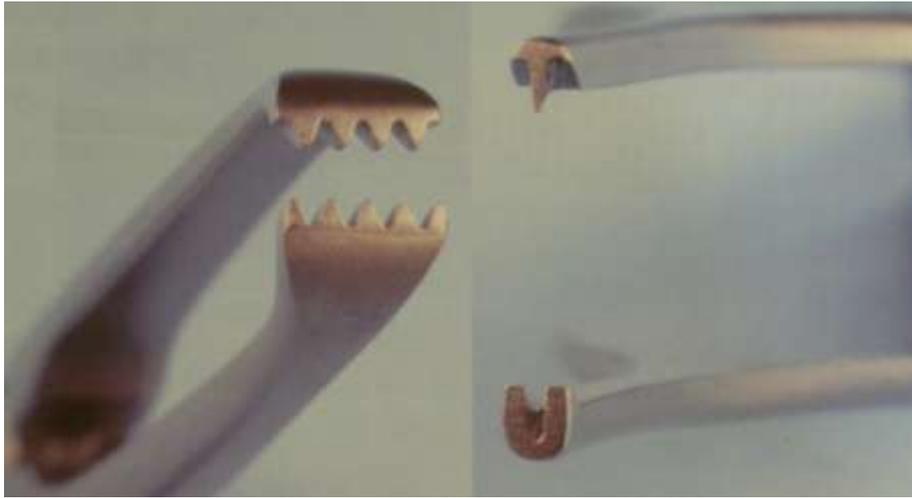
Bone tissue healing

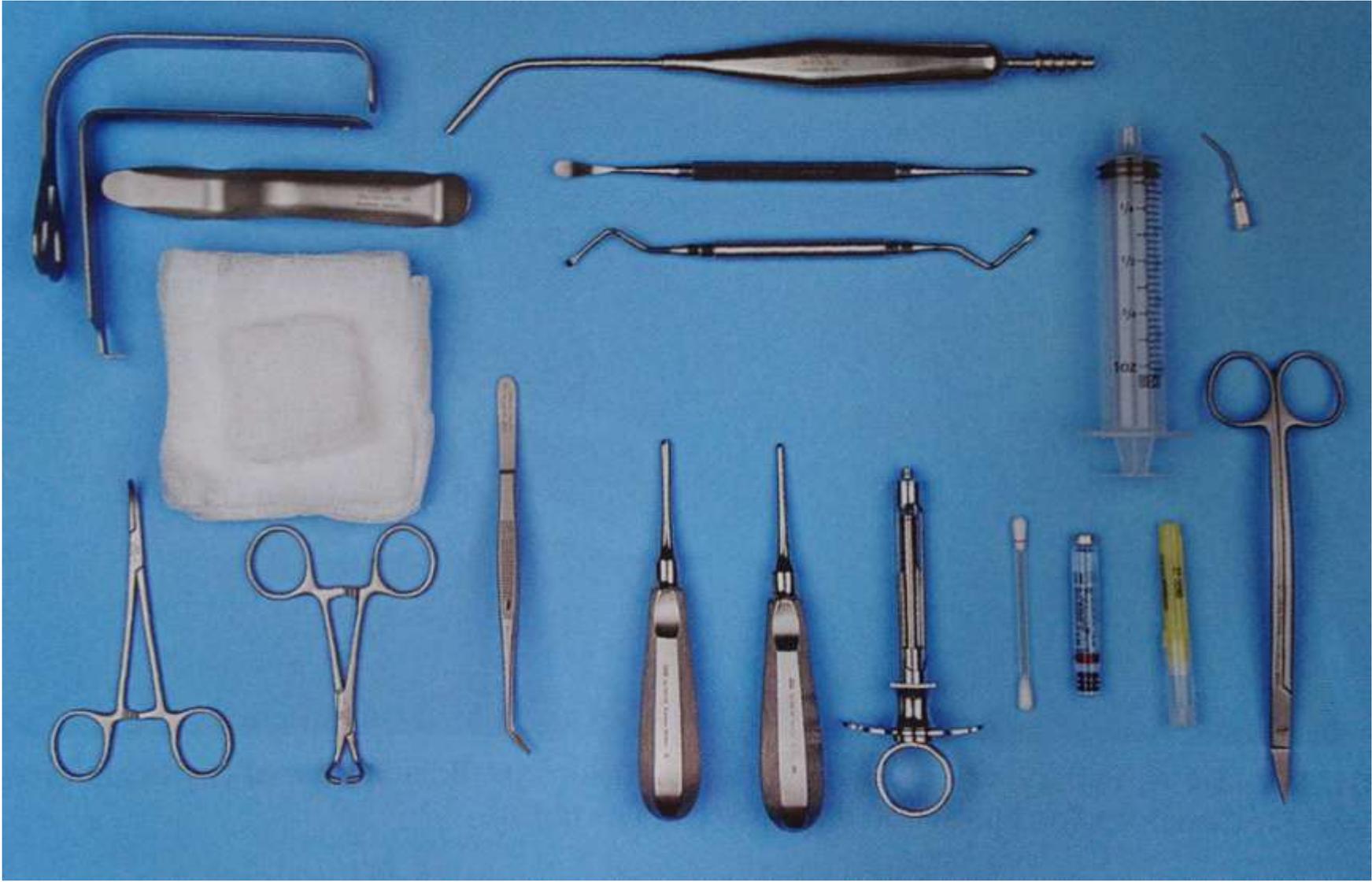
- 6- 8 months for new bone to fill the socket.













Left hand operator (right hand position)





