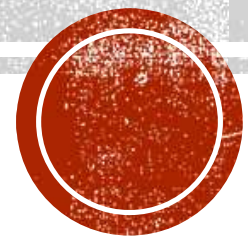
EXODONTIA



EXODONTIA

Definition:

The painless removal of the whole tooth, or root, with minimal trauma to the investing tissues, so that the wound heals uneventfully & no post-operative prosthetic problem is created.

(Geoffray L Howe)

INDICATIONS

1. Deeply carious tooth with pulpal pathology
2. Teeth with apical pathology
3. Periodontitis
4. Malpositioned and overerupted teeth
5. Impacted
6. Retained decidious teeth
7. Tooth in the line of fracture
8. Teeth with fractured root
9. Orthodontic purpose
10. Prosthetic purpose
11. Before radiation therapy (teeth in line of fire)
12. Prophylactic extraction
13. Root fragments

CONTRAINDICATIONS

- Absolute

Systemic conditions

1. Uncontrolled diabetes
2. Leukemia
3. Renal failure
4. Cardic failure

- Relative

1. Diabetes
2. Hypertension
3. Cardiac disease
4. Patient on steroid therapy
5. Pregnancy
6. Blood dyscrasias

7. Patient on anticoagulant therapy
8. Toxic goitre
9. Jaundice/Hepatitis
10. Renal disorders
11. Medically compromised patients
12. Extraction of teeth in recently irradiated patient

PRINCIPLES OF TOOTH REMOVAL

I. Assessment of teeth for extraction
II. Preoperative radiographs
III. Surgical plan
IV. Anaesthesia

I. Assessment of teeth for extraction

A tooth can be atraumatically and successfully extracted out of the socket depending upon the technique used, morphology of the tooth, its position in the dental arch and condition of the surrounding bone.
Before the removal of the tooth, preoperative radiographs are taken for assessment of the tooth to be removed.

The preoperative assessment should cover the following points:

1. Morphology of the crown (Normal, Macroform/microform, Abnormal/deformed)
2. Morphology of the roots (dilacerated, fused, impacted, ankylosed, hypercementosed or divergent roots)
3. The density of the bone surrounding the tooth
4. The relationship of the tooth to adjacent teeth and other important anatomical structures as inferior alveolar canal
5. Presence of any pathology of the tooth or the bone surrounding it
6. Condition indicating dental or dentoalveolar deformities such as osteitis deformans, hypercementosis, cleidocranial dysostosis—hooked root, therapeutic irradiation, osteopetrosis, etc.

II. Preoperative radiographs

Indications

1. Previous difficulty with extractions and attempted extractions
2. Close approximation with important anatomical structures
3. Abnormal root pattern—third molars, misplaced canine
4. Tooth having periodontal problem and some sclerosis— hypercementosis
5. Trauma to tooth—fracture of tooth, roots and alveolar bone
6. Isolated and unopposed maxillary molars
7. Partially erupted, unerupted tooth and retained roots
8. Delayed erupting or having abnormal crown

III. Surgical plan

- Based on complete evaluation of the patient the surgeon must decide whether the treatment should be undertaken **in the hospital or in the dental office.**
- **Supportive measures** such as preoperative sedations, antibiotics, dietary supplements and other drugs must be considered based on the surgical plan and patient's general physical condition.

IV. Anaesthesia

1. Local anaesthesia

Most of the minor surgical procedures can be performed under local anaesthesia successfully; however, in certain situations, general anaesthesia may.

but there are certain restrictions of local anaesthesia such as:

- Some conscious patients cannot tolerate lengthy surgical procedures carried out under local anaesthesia.
- Children under the age of 8 years cannot differentiate between the sensation of pain and pressure and hence they presume pressure as pain and become uncooperative. Even an older individual who is nervous can have the same problem.
- If there is an area of acute infection, it is not advisable to inject the local anaesthetic solution in that area for risk of spreading infection and failure of anaesthetic effect due to acidic environment.

2. General anaesthesia

Maybe necessary, e.g. when the patient is allergic to local anaesthetic, uncooperative patient

For shorter procedures lasting less than 10 min, intravenous injection followed by inhalation anaesthesia is suitable but if the procedure is beyond this time, an endotracheal intubation should be used.

TECHNIQUES OF EXTRACTION OF TEETH

I. Intra-alveolar (closed) extraction

Removal of an erupted tooth by expansion of bony alveolar socket alone, using principles of lever, wedge and wheel.

Tooth extracted in a simple manner using forceps

II. Transalveolar (open) extraction

Therapeutic removal of impacted, unerupted teeth that includes access through a surgical flap for visualisation and appropriate bone removal to create a pth for delivery and facilitate extraction.

A mucoperiosteal flap is elevated and the tooth is extracted surgically.

INTRA-ALVEOLAR EXTRACTION

1. **Position of the patient**

The best possible position is one that is comfortable for both the patient and the surgeon.

This position should allow the surgeon to keep his/her arm close to his/her body, which lends stability and support and also allows to keep his/her wrist straight enough to deliver maximum controlled force to the patient's tooth through the forceps.

The force should be delivered with the arm and shoulder but not with the hand.

1. **Position of the patient's head neck and trunk**

The chair is adjusted in such a way that the head, neck and trunk are in one line, this will nullify any strain caused by stretching it backward or pushing it forward.

1. **Angulation of the chair**

The chair should be angulated in such a way that the occlusal surface of the mandibular teeth are parallel or at 10 degree to the floor, when the operator is working on the mandibular teeth and standing in front of the patient.

When working on the maxilla, the chair should be angulated so that the occlusal plane of the maxillary teeth is between an angle of 45 and 60 degree to the floor

4. **Height of the chair**

   Procedures on the mandible - The occlusal plane of the mandibular teeth should be at or slightly below the level of surgeon's elbow.

   Procedures on the maxilla - The occlusal plane of the maxillary teeth should be above the level of the surgeon's elbow towards his/her shoulders.

5. **Position of the operator during extraction** The surgeon should position him-/herself in such a way that he/she can apply the forces necessary for extraction without any stress to his/her own back or shoulders. The dentist should stand as erect as possible with his/her weight equally distributed on each foot

6. **For the extraction of maxillary teeth** The surgeon should stand on the right side and in front of the patient with the bent elbow for posterior and straight for anterior teeth and should apply the forceps onto the tooth while the other hand holds the alveolus with the finger and thumb on either side of the involved tooth.

7. **For the extraction of mandibular teeth** The surgeon should stand on the right side of the patient for both the quadrants. For the extraction of the left lower side, the operator should stand in front of the patient; and for the right lower side, the operator should stand behind the patient. Apart from supporting the alveolus on each side by the thumb and forefinger, the left hand should also support the mandible

PRINCIPLES OF TOOTH REMOVAL

1. **Access and visual field**
   Good access and clear visual field
2. **Use of uncontrolled force**
   The forces applied should be always kept under control.
   Elevators help in widening the pdl space thus loosening the teeth before its removal.
   Forceps help in the removal of the teeth by applying rotatory forces and buccal and lingual movement
3. **Unimpeded path of removal** - Whenever there is any resistance to the removal, sectioning of the teeth (odontectomy) should be considered. Malposed, impacted and deeply carious teeth do not have a clear path of removal and therefore must be sectioned before removal.
4. **Expansion of bony socket** - specially considered for forceps extraction.

   When force is applied, bony socket expands resulting in slow separation of pdl from bone.

1. **Mechanical principles in tooth extraction**
   i. Lever principle
   ii. Wedge principle
   iii. Wheel and axle

LEVER PRINCIPLE

- **Basic components**

1. Fulcrum - fulcrum is between the effort and the load
2. Effort –
3. Load

The effort arm on one side of the fulcrum should be longer than the load arm on the side of the fulcrum.

Force is transmitted at the long arm

Mechanical advantage gained at short load arm

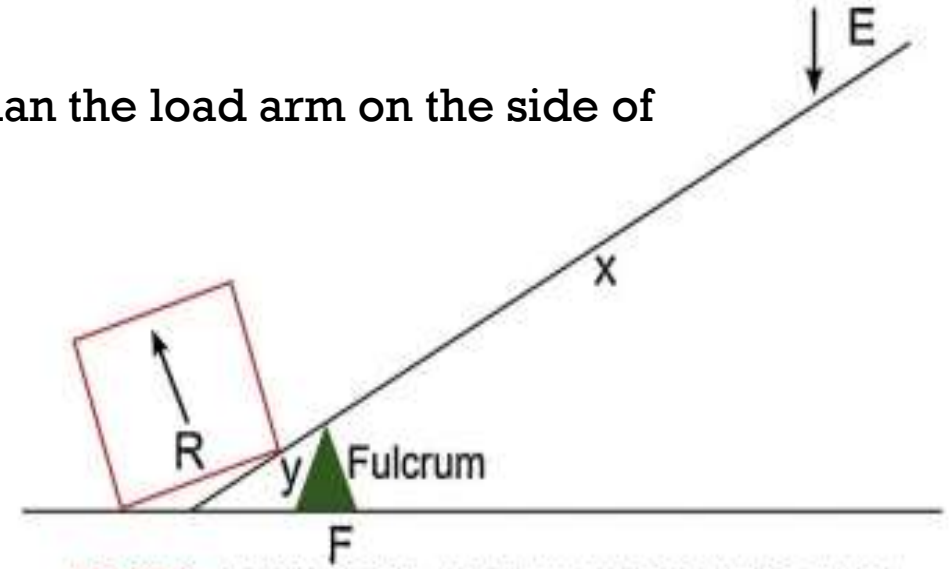


FIG. 17.10 Lever principle. *x*-long arm; *y*-short arm; E = Effort (handle, hand), R = Resistance (tooth), F = Fulcrum (alveolar crestal bone).

- **Application**

Forceps – used in combination with wheel and axle

Hinge of forceps acts as a fulcrum

Two arms represent each component of the lever

Grip should be farther from the fulcrum and the blade should be shorter

Elevators –

Handle represent the effort

The working end which engages the tooth represent the load

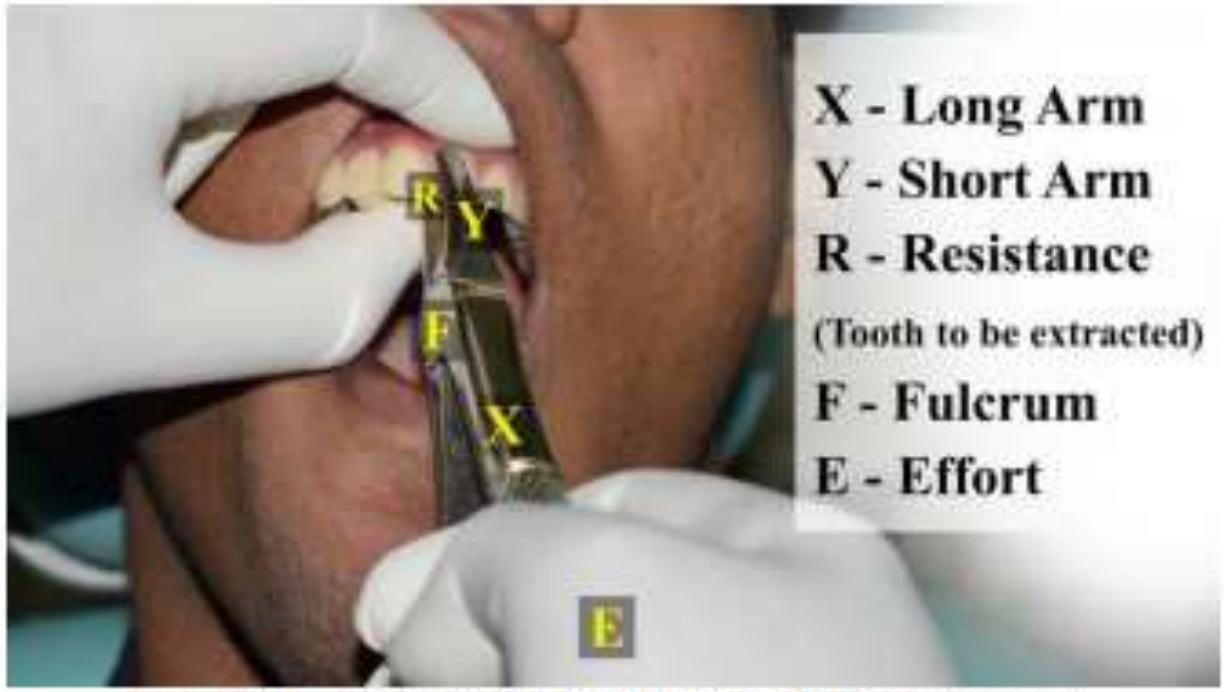


FIG. 17.11 Lever principle in forceps. Hinge = fulcrum, beaks = short arm, handles = long arm, teeth = resistance, hand = effort.

FIG. 17.12 Lever principle in elevators. Tooth and working tip = load, handle = effort, external oblique ridge (buccal bone) = fulcrum.

WEDGE PRINCIPLE

- **Basic components**

Two movable inclined planes with base on one end and blade on other end which overcomes a large resistance at right angles to applied force.

The effort is applied to the base of the plane

The resistance has its effect on the slant side

- **Application**

Used to split, expand or displace portion of the substance that recieves it

Elevators –

When luxating a tooth from its socket, a straight elevator is applied between the tooth and the bone to separate the attachment of the pdl from the bone

Extraction forceps –

For carrying out extraction, the tip of the forceps inserted in b/w mucoperiosteum and the surface of the tooth.

When beaks are inserted further, mucoperiosteum gets displaced, the bony sockets are expanded which results in slow separation of pdl from bone

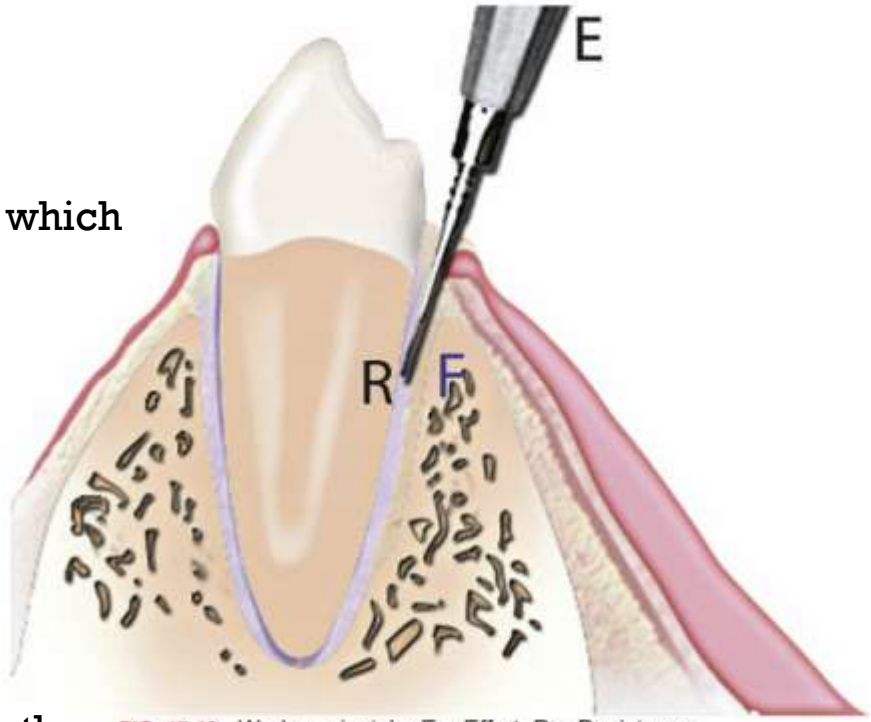


FIG. 17.13 Wedge principle. E = Effort, R = Resistance, F = Fulcrum, Mechanical advantage of wedge is 2.5.

FIG. 17.14 Wedge principle in elevators—insertion of straight elevator between the tooth and the alveolar bone expanding the PDL space.

FIG. 17.15 Wedge principle in forceps—beaks of forceps inserted between the mucoperiosteum and tooth, further into PDL space causing slow alveolar bone expansion.

WHEEL AND AXLE PRINCIPLE

Machine being a modified form of lever

Effort applied to circumference of wheel which turns the axle so as to raise the weight

Greater the diameter of wheel, more is the mechanical advantage.

- **Application**

Elevators – crossbar elevators – removing the mandibular roots

Working point engaged deep into the space between tooth root and bone and handle (compared to the wheel) is rotated.

Root is removed from its socket by moving about a circumference of the circle (compared to the axle) which the roots would have made if they continued on around.

Extraction forceps –

To remove a tooth, the beaks of the forceps applied firmly on either side of the tooth and

Force is applied in the form of an arc.

Force applied on the handle of the forceps it results in a bodily rotation of the tooth in socket

Always hold forceps handle (compared to the wheel) as farther away as possible to increase the effort arm (compared to the axle)

Pdl attachment gets ruptured due to bodily rotation of the tooth

Can be used separately or in conjunction with wedge or lever principle

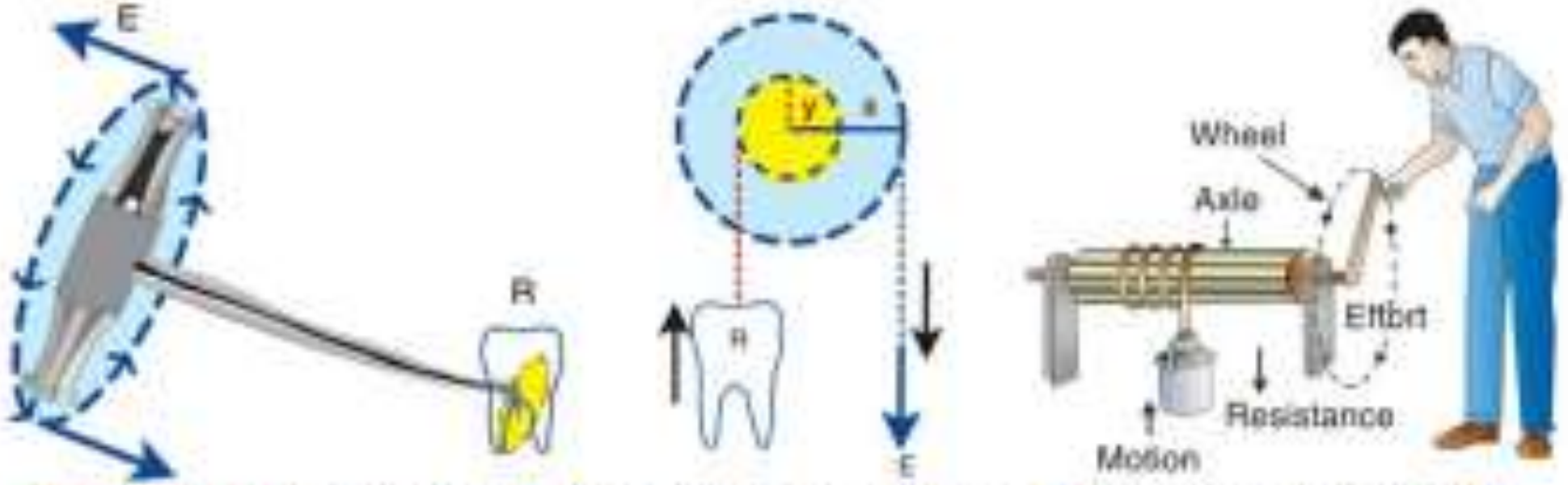


FIG. 17.16 Wheel and axle. *x*-radius of wheel; *y*-radius of the axle, E = effort, R = resistance, mechanical advantage of crossbar is 4.6.

FIG. 17.18 Application of wheel and axle principle for forceps.

FIG. 17.19 Wheel and axle principle. Note the position of the hand away from the axle for the mechanical advantage.

A R M A M E N T A R I U M

1. **Elevators**
2. **Forceps**

Elevators

Primarily used as lever

Very safe and efficient to use

Parts of elevator-

1. Handle—this part is used for holding the instrument
2. Shank—this part connects the handle with the blade
3. Blade—this part of the instrument engages the crown or the root to be removed

Indications

- To reflect mucoperiosteum
- Elevators can be used to widen the periodontal ligament space before applying the forceps for extraction (wedge/lever principle)
- To luxate and remove the tooth from its socket which cannot be engaged with forceps
- To remove a fractured or carious tooth or roots which might fracture when engaged with beaks
- To remove interradicular bone
- To remove a fractured root when the fracture line is below the cervical margin of alveolar bone

Classification

According to the form:

- Straight
- Angular
- Crossbar

Commonly used elevators are:

- Periosteal elevators
- Crossbar elevators
- Apexo elevators

1. Periosteal elevators

used particularly for the reflection of the mucoperiosteum from the underlying bone before extracting the teeth

FIG. 17.23 Periosteal elevator.

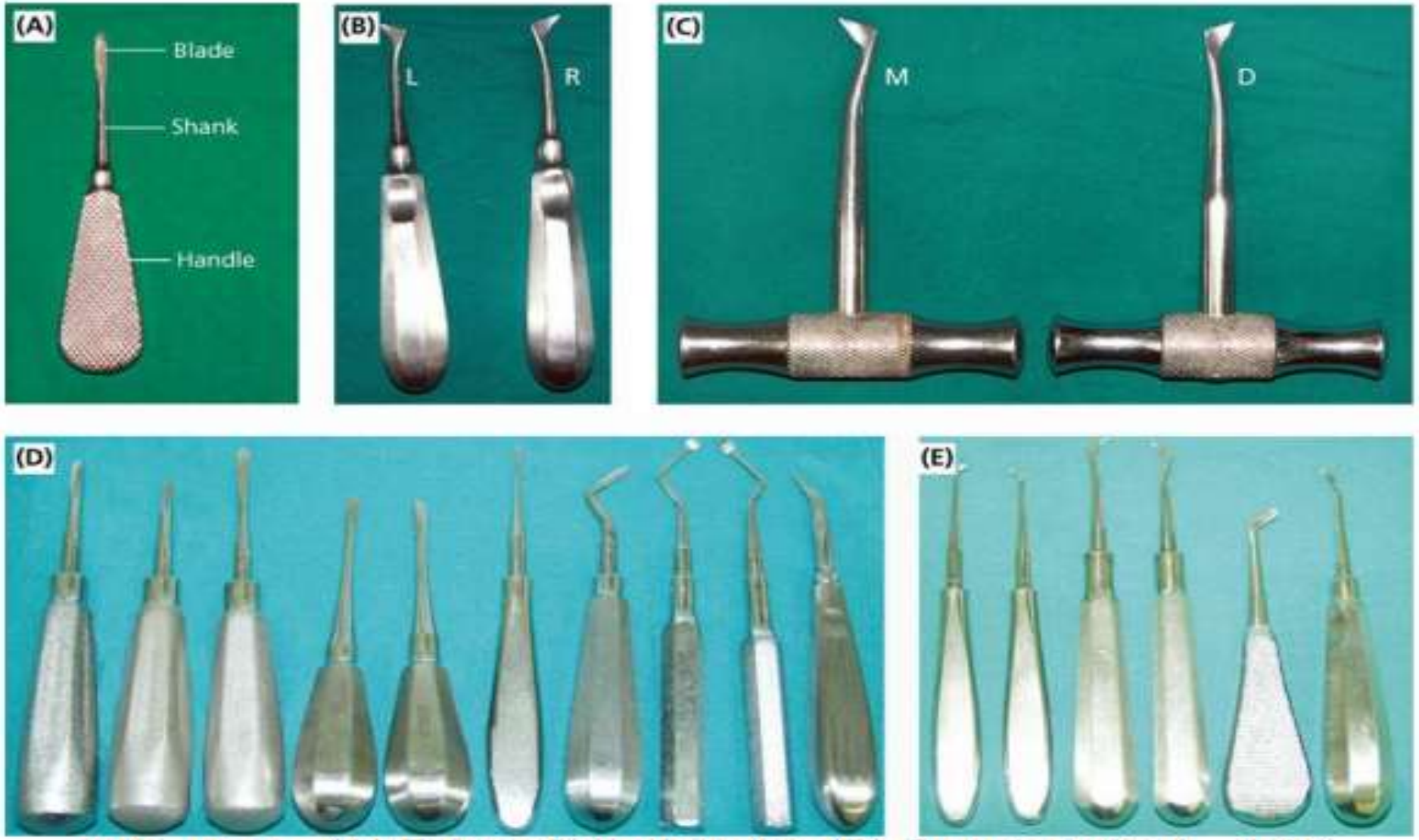


FIG. 17.21 (A) Parts of an elevator. (B) Cryer's paired—right (R)and left (L). (C) Cross bar paired—mesial (M)and distal (D). (D–E) Various types of elevators.

- Commonly used elevators

1. Straight elevators – used for luxation of teeth
2. Apexo elevators
3. Cryer's elevator
4. Winter's elevator
5. Winter Cryer's elevator

2. Apexo elevators

used for removal of fractured root, impacted maxillary third molars and impacted cuspids.

They are available in various numbers.

- **No. 301 straight apexo elevator**

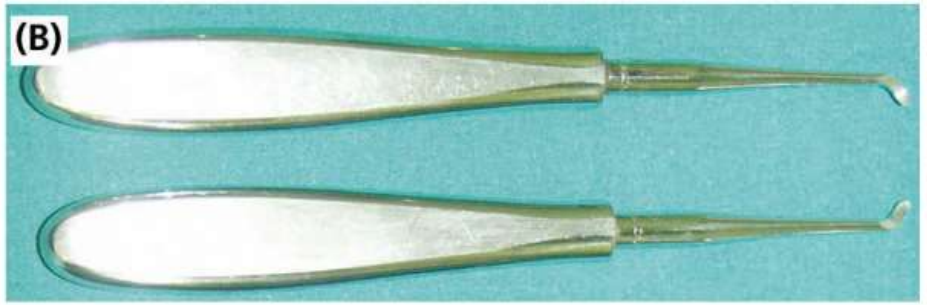
used for the removal of fractured roots (at the gingival line) of maxillary central and lateral incisors, bicuspids and cuspids.

applied on the mesial and distal sides of the root by using wedge principle to expand the socket.

finally, when the socket has expanded sufficiently, rotary motion is applied to remove the root from the socket.

- **No. 73 and 74 elevators**

  used for removing the impacted maxillary third molars.



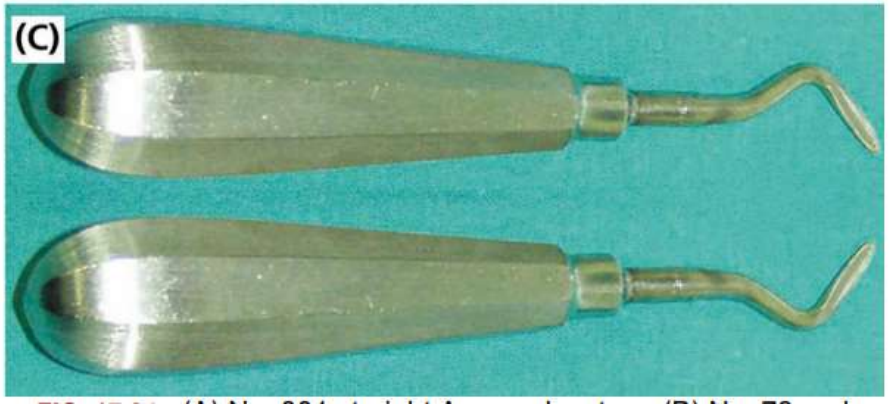
- **No. 4 (302) and 5 (303) apexo elevators**

  used when the mandibular root has fractured below the gingival line.

  the blade is at 90-degree angle to the handle.

  used in a similar manner as that of the straight Apexo elevators.

  can be applied on the mesial aspect of the left lower fractured roots, as well as on the distal aspect of the fractured root in theright lower side.



- **No. 5 apexo elevators**

  used on the distal side of the fractured roots in the left lower side, as well as on the mesial side of the fractured roots in the right lower side.

  After applying these forceps on the respective sides of the fractured root, apical and rotary pressure is applied to gain a depth of 2–3 mm in between the fractured ` tooth root and the bone to expand the socket.

  If this depth is not obtained, a purchase point can be drilled before inserting the elevator. Alternatively, this pressure is applied on the mesial and distal side of the root until it luxates out of the socket.

3. Crossbar elevators

Used particularly for removal of mandibular molar roots and impacted mandibular third molars.

It is also known as **Winter's crossbar elevator.**

They work on the principle of wheel and axle and can extract with extreme forces.

They are available in various numbers

No. 11L and 11R.

No. 11L used for removing right lower third molar wherein the thick buccal plate acts as fulcrum. The elevator is inserted from the buccal aspect of the right lower third molar to engage between the bifurcation of the molar and the elevator is rotated to lift the tooth out of the socket.

No. 11R is used for removing the left lower third molar.These elevators can also be used to remove the vertically impacted third molars and roots of horizontally impacted third molars.

No. 14L and 14R.

No. 14L elevator (also No.11L) is used to remove the mesial roots of the right lower molars and distal roots of lower left molars by engaging the elevator in the adjacent socket wherein the intervening septum is thin.

No. 14 R elevator (also No.14R) is used in a similar manner to remove the distal roots of right lower molars and mesial roots of left lower third molars.

No. 1L and 1R.

No. 1L anused to extract vertically impacted third molars and also for luxating the maxillary and mandibular teeth before removing them. The elevator is wedged in between the teeth and anteroposterior force is applied to loosen them, which are then removed with forceps.

Precautions to be followed in using elevators

• We should never use the adjacent tooth as a fulcrum as this will damage or even luxate the adjacent tooth.

• We should always use finger guard to protect the patient tissue as slipping of the instrument tip into the soft tissue might cause tissue damage.

• The forces applied through the instrument should be under control; failing to do so would cause fracture of the maxilla, mandible or the alveolar process. So a control of the instrument with index finger on the shank is mandatory (Fig. 17.27).

• The instrument tip should deliver the force in the correct direction to avoid the accidental forcing of the tooth into maxillary antrum

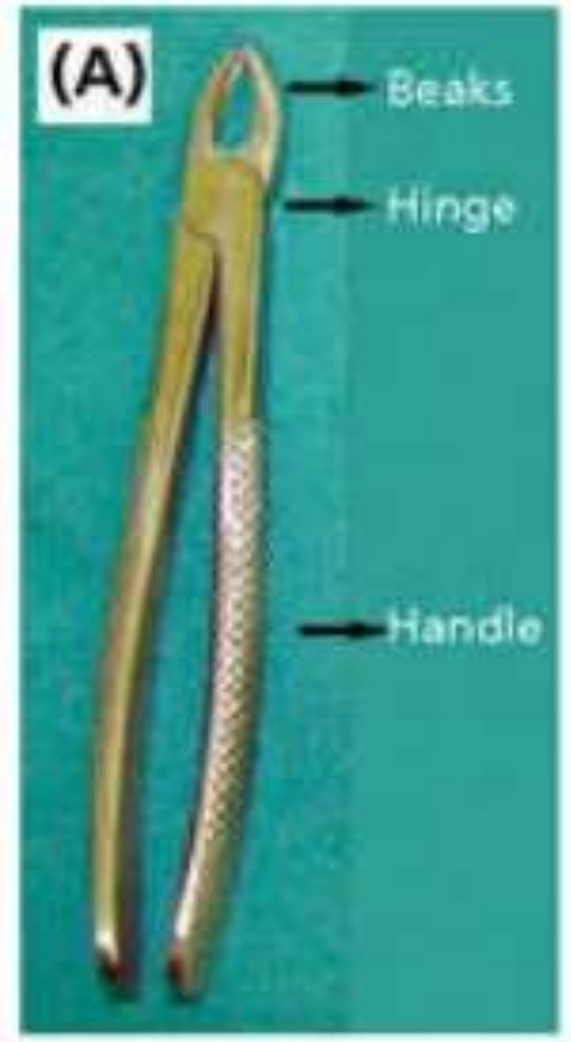
Forceps

Main instruments used in the extraction of teeth.

Help in dilatation of the alveolar socket, luxation of the tooth and its removal

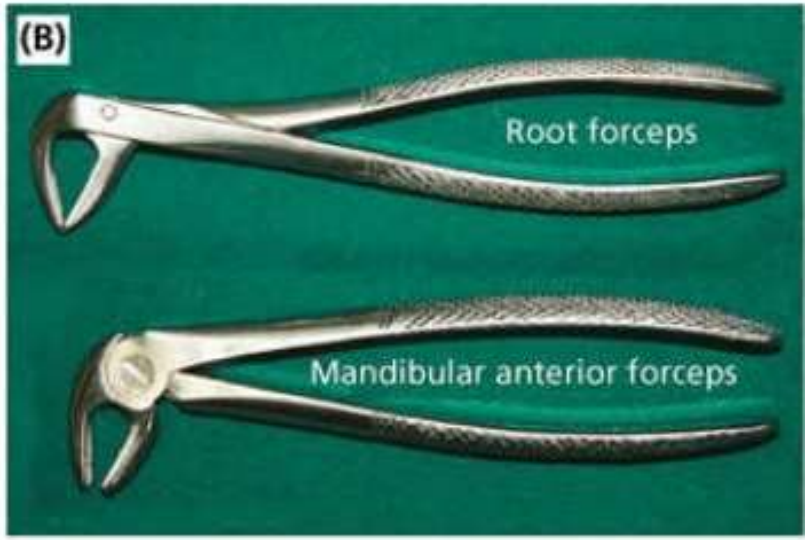
- **parts**

1. Pair of handles
2. Pair of beaks
3. A hinge



upper jaw forceps have beaks, which are parallel to the long axis of the handle

lower jaw forceps have beaks at right angle to the long axis of the handles



(B) Forceps for extraction of **mandibular anterior teeth and roots.** Note approximation of beaks in root forceps whereas beaks do not meet in the other.

(C) Forceps for extraction **of mandibular molars.** Two types based on axis of working end in relation to handle.

(D) Application of forceps for extracting mandibular molar.

(E) Buccal and lingual beaks of **mandibular molar forceps** designed to engage the furcation between the mesial and distal roots.

(F) Forceps for extraction of **maxillary molars**, right and left.

(G) Forceps for extraction of **maxillary anterior teeth**.

(H) **Right maxillary molar forceps**—buccal beak is pointed to engage the furcation between MB and DB roots; palatal beak is rounded to engage the single palatal root.

(I) Special armamentarium for extraction of maxillary teeth.

(J) **Maxillary bayonet forceps** with angled beaks facilitating extraction of last molar. Implication of the name is from bayonet gun.
(K) **Maxillary cow horn forceps**, **mandibular cow horn forceps**, implication of the name cow horn

Principles of use

The forceps is applied with an apical pressure by inserting the beaks on the buccal/labial and lingual/palatal aspect of the tooth, in between the bone and the surface of the tooth so that the beaks rest on the root/roots of the tooth.

The beaks of the forceps should be parallel to the long axis of the tooth.

This results in a minimum apical movement of the tooth and expansion of the socket.

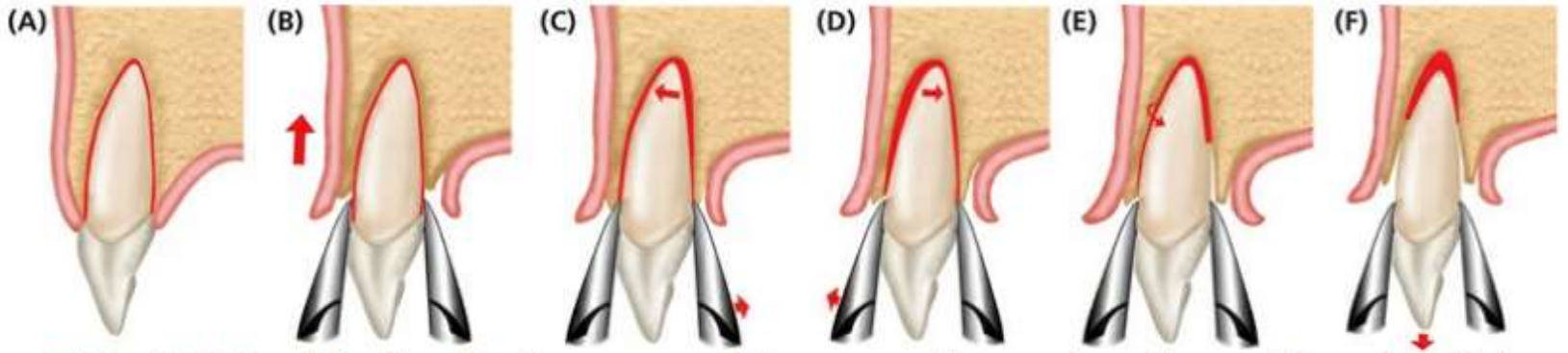


FIG. 17.29 Method of usage of forceps for extraction of teeth. (A) Before extraction. (B) Apical pressure applied with forceps. (C) Application of lingual pressure. (D) Application of buccal pressure. (E) Rotational force applied. (F) Tractional force applied and tooth removed by the buccal aspect.

Force application

When buccal force is applied, it results in the expansion of the buccal plate.

This movement causes the pressure to be concentrated on the crest of the alveolar ridge on the buccal aspect and also causes lingual apical pressure.

Then lingual force is applied with a similar concept as aforementioned but in a lingual direction. The buccal and lingual forces are applied in combination for the removal of most of the teeth.

As in the maxilla, the palatal bone is thicker when compared to the buccal bone, the teeth are removed via strong buccal force and less vigorous palatal force (if stronger palatal force is applied the palatal root tip may fracture which is hard to retrieve).

In the mandible also, the buccal bone is thinner than the lingual bone particularly in the anterior teeth.

Therefore, the anteriors and the premolars are removed via strong buccal force and less vigorous lingual forforce. In the molar region, the buccal plate of bone is thicker; hence, strong lingual force should be applied and the tooth is removed through the buccal force. Then rotational pressure is applied on the tooth, which causes expansion of the socket and rotation of the tooth around its fulcrum, which usually lies near the apical tip of the tooth root. If the roots of the tooth are very long or if they are curved or multiplied, then root fracture is more likely when using rotational force.

Rules

1. The correct forceps for the particular tooth to be extracted must be selected.

2. Grasp the forceps at the far end of the handles so that they are almost covered by the palm of the hand. Do not grasp the forceps near the beaks.

3. The long axis of the forceps beaks must be parallel to the long axis of the tooth.

4. Forceps beaks must be grasped firmly on sound root structure and not on the enamel of the tooth crown.

5. Make certain that the beaks of the forceps do not impinge on adjacent teeth during the luxation.

• Forces applied for different teeth

Basic forces exerted in extraction of maxillary teeth in normal position in the arch

First pressure applied for the extraction of all maxillary teeth is apical force.
The beaks of the forceps should engage the neck of the tooth, resting on cementum.
Then apply pressure as follows:

Tooth	Steps in the procedure	Forceps and elevators used
Central incisors	Labial pressure, then lingual pressure, then labial pressure with mesial rotation.	Maxillary universal forceps
Lateral incisors	Labial pressure, then lingual pressure, then labial pressure with mesial rotation.	Maxillary universal forceps
Cuspids	Labial pressure, then lingual pressure, then labial pressure with mesial rotation.	Maxillary universal forceps
First bicuspids	Buccal pressure, lingual pressure and removal in the buccal direction.	Maxillary universal forceps or no. 150 forceps
Second bicuspids	Buccal pressure, lingual pressure and removal in the lingual or buccal direction.	Maxillary universal forceps or no. 150 forceps
First and Second Molars	Buccal pressure, slight palatal pressure and distal rotation.	Maxillary right or left molar forceps for the respective side
Third molar		Maxillary right or left third molar forceps Cryer's paired—right (R) and left (L)

Basic forces exerted in extraction of mandibular teeth in normal position in the arch

Tooth	Steps in the procedure	Forceps and elevators used
Central, lateral incisors and cuspids	Labial pressure, lingual pressure; slight mesial to distal force and removal in the labial direction.	Vertical hinge mandibular forceps (mandibular anterior forceps)
First and second bicuspids	Buccal pressure, with slight mesio-distal rotation.	Vertical hinge mandibular forceps (mandibular anterior forceps)
First and second molars	Buccal pressure, lingual pressure and removal in the buccal direction.	Mandibular molar forceps (vertical or horizontal hinge forceps) Mandibular cow horn forceps
Third molar	Buccal pressure and removal in the buccal or lingual direction.	Mandibular right or left third molar forceps (Straight elevator) Straight Bein elevator (Coupland's elevator)

ORDER OF EXTRACTION

- **Extraction of teeth in upper arch prior to the lower arch** – as upper arch gets anaesthetised earlier than the lower arch. It prevents any inadvertent fall of enamel or amalgam debris into the extraction socket in the lower arch. This rule can be applied in all cases except for the removal of impacted teeth.

- **Extraction of the most posterior tooth** is done first; this causes haemorrhage to collect in the posterior region so that the vision to the surgical field is not affected in the anterior region.

- If complete extraction has to be done in a patient with full complete set of teeth or in whom it is difficult to extract, first molar and canine are extracted after their adjacent teeth are removed. This results in a better purchase on the tooth and also has the advantage of earlier plate expansion resulting from adjacent extractions. These two teeth are encased in the so-called bony pillar of the face.

Following the above rules, the order of extraction in an arch of a jaw is:

- Third molar
- Second molar
- Second premolar
- First molar
- First premolar
- Lateral incisor
- Canine
- Central incisor

EXTRACTION OF DECIDUOUS TEETH

- Differs slightly from the normal extraction method used for the permanent teeth. Unlike the permanent teeth, dental radiographs are essential before the extraction of any tooth.

Indications

- Gross dental caries involving the pulp
- Retained deciduous teeth
- Primary tooth with periapical pathology
- Primary tooth with root fracture
- Serial extraction

SERIAL EXTRACTION

- Serial extraction is a form of interceptive orthodontic treatment, which aims to relieve crowding at an early stage so that the permanent teeth can erupt into good alignment, thus reducing or avoiding the need for later orthodontic therapy.
- •Chronologically, crowding may become manifested at 7 years of age on eruption of the incisors, at 10–12 years on eruption of the canines, premolars or during the adolescence in the form of late labial segment imbrications.
- **Indications**

  • The patient should be between 8 and 9 years of age with crowding of incisors.

  • The fundamental arch relationship should be normal (Angle class I) showing harmony between skeletal and muscular system.

  • Arch length deficiency as compared to tooth material is the most important indication for serial extraction.

  This is indicated by:

  ▪ Absence of physiological spacing

  ▪ Unilateral or bilateral premature loss of deciduous canines with midline shift

  ▪ Malpositioned or impacted lateral incisor that erupt palatally out of the arch

  ▪ Markedly irregular or crowded upper or lower anteriors

  ▪ Localised gingival recession in the lower anterior region is a diagnostic feature of arch length deficiency

  ▪ Ectopic eruption of teeth

- Mesial migration of buccal segment
- Abnormal eruption pattern and sequence
- Lower anterior flaring
- Ankylosis of one or more teeth

• There should be normal or reduced overbite and all the teeth should be seen on radiograph and in good position to erupt.
• There should be a large arch perimeter deficiency of 10 mm or more.

- **Contraindications** :

• Class II and III malocclusion with skeletal abnormalities
• Spaced dentition
• Anodontia/oligodontia
• Open bite and deep bite
• Class I malocclusion with minimal spaced efficiency
• Unerupted malformed teeth, e.g. dilaceration
• Extensive caries or heavily filled first permanent molars
• Mild disproportion between arch length and tooth material that can be treated by proximal striping

- **Methods**

Different procedures have been described by different authors such as;

1. Dewel's method (1978); 8½ years [CD4]
2. Tweed's method (1966); 8 years [DC4]
3. Nance's method (1940); DC4

Dewel's method–CD4 Proposed a 3 serial extraction procedure

• Removal of deciduous canines to create space for the alignment of the incisors (between 8 and 9 years)

• A year after, the removal of deciduous first molars to aid quick eruption of the first premolars

• This is followed by the extraction of first premolars to permit the permanent canines to erupt in their place

• In some cases, a modified Dewel's technique is followed wherein the first premolars are enucleated at the time of extraction of the first deciduous molars

• This is necessary in the mandibular arch where the canines often erupt before the first premolars.

Tweed's method–DC4

• This method involves the extraction of the first deciduous molars around 8-years of age.

• This is followed by the extraction of first premolars and the deciduous canines simultaneously.

Nance method–DC4 Nance method is similar to DC4 Tweed's method.

- **Extraction technique**

Young children have very elastic bone, which expands rapidly when pressure is applied.

The permanent successor of deciduous teeth usually lies below them and may be closely related to the roots of the deciduous teeth; therefore extreme care must be taken while extracting the deciduous teeth.

During extraction, if the root is broken it can be left as such because, though not always, it will get naturally resorbed.

Secondly, inadvertent removal of the root may jeopardise the permanent tooth bud lying below it.

The forceps used for extraction are comparatively smaller than those used for extraction of the permanent teeth.

- For extracting mandibular and maxillary anteriors, labial pressure with mesial rotation is applied and removed to the labial side.
- For removing the maxillary and mandibular molars, buccal pressure is applied followed by lingual pressure and is removed to the lingual side.

The forces required to remove the tooth are very less and the forceps need not be inserted too deep along the root. The elevators can be used for the removal of deciduous roots.

In case of molars they should be applied distally for the removal of distal root and mesially for the removal of mesial roots.

If by accident the unerupted or partially erupted permanent tooth is removed during extraction, it should be carefully replaced into the crypt or socket and the wound closed.

The patients should be instructed not to disturb that area. The use of curettes should be avoided to remove the granulation tissue after the extraction of the primary tooth.

Extraction of submerged deciduous teeth

When a deciduous molar undergoes ankylosis of the roots during replacement resorption, the alveolar bone envelopes this deciduous teeth which seems to have partially or fully submerged.

These teeth are usually identified during regular radiography.

Occasionally they might be a source of infection leading to sinus formation.

The roots of the submerged tooth are often very slim and have a very thin periodontal membrane covering or are in direct contact with the bone.

It is extremely important to ensure that all the roots are removed during extraction.

Removal of submerged deciduous teeth is similar to removal of impacted teeth.

POSTOPERATIVE INSTRUCTIONS

In a clinical practice, it is judicious to instruct the patient orally and in a written form concerning exactly what to do in the next few days.

These instructions normally include:

• **Bleeding**: The patient must bite firmly on gauze placed over the wound for 30–45 min. In case bleeding continues, another gauze is placed over the wound for a further hour.

• **Edema**: After the procedure, the extra oral placement of cold compresses (ice pack wrapped in a towel) over the surgical area is recommended every 15–20 min at a time, and repeated every half hour, for at least 4–6 h.

• **Oral hygiene**: The patient should be advised to brush and floss, but should be advised to avoid the area of surgery. Rinsing the mouth is not allowed for the first 24 h. After this, the mouth may be rinsed with salt water, 3–5 times a day for 3–4 days.

• **Antibiotics and analgesics**: Antibiotics are mandatory for patients who undergo any invasive procedure. Many study show evidence that antibiotics administered preoperatively or postoperatively reduce the risk of infection, pain and dry socket after tooth extraction. Analgesics advised (e.g. NSAIDS and opioids but not salicylates, aspirin) should be consumed, as long as the pain persists.

• **Diet:** The patient's diet on the day of the surgical procedure must consist of cold, liquid foods (pudding, yogurt, milk, cold soup, orange juice, etc.).

• **Removal of sutures**: Intraoral sutures are usually removed in a week.

Transalveolar extraction (Open method)

Transalveolar extraction refers to surgical removal of a tooth or root that involves bone removal.

Indications

- Any tooth or root which cannot be removed using elevators or forceps
- Unerupted teeth, impacted teeth
- Tooth with extensively curved or dilacerated roots
- Endodontically treated teeth or grossly carious teeth
- Hypercementosed or ankylosed teeth
- Retained root fragments

COMPLICATIONS OF EXTRACTION

A. **Complications occurring during the surgical procedure**

- Soft tissue injury
- Extraction of the wrong teeth
- Fracture of the teeth during extraction
- Fracture of tooth root during extraction
- Fracture of the alveolus
- Fracture of tuberosity
- Displacement of the tooth in to the maxillary sinus
- Creation of oroantral fistula
- Fracture of mandible
- Breakage of instrument
- Luxation of adjacent tooth

- Injury to inferior alveolar nerve
- Injury to lingual nerve
- Swallowing of teeth
- Aspiration of teeth
- Dislocation of condyle

B. Complications occurring after the surgical procedure

- Presence of bony spicule
- Haemorrhage
- Dry socket
- Infection Soft tissue injury

REFERENCES

- S.M.Balaji
- Neelima Malik