Teeth extracting instruments

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Teeth extracting instruments

One of the most important instruments used in the extraction procedure is the dental elevator. These instruments are used to:

1- luxate (loosen) teeth from surrounding bone.
2- dental elevators are also used to expand alveolar bone
3- elevators are used to remove broken or surgically sectioned roots from their sockets.

Dental Elevators

The three major components of the elevator are (Figure 6-30):

1) the handle : The handle of the elevator is usually of generous size. In some situations, cross-bar or T-bar handles are used. These instruments must be used with great caution because they can generate an excessive amount of force (Figure 6-31).

2) shank

3) blade

Figure 6-30 The major components of an elevator are the handle, the shank, and the blade.

Figure 6-31 A cross-bar handle is used on certain elevators. This type of handle can generate large amounts of force and therefore must be used with great caution.
Types of Elevators
The biggest variation in the type of elevator is in the shape and size of the blade. The three basic types of elevators are:

1) **the straight type** *(Figure 6-32):*

- is the most commonly used elevator to luxate (loosen) teeth.
- The blade of the straight elevator has a concave surface on one side that is placed toward the tooth to be elevated.
- The small straight elevator, No. 301, is frequently used for beginning the luxation of an erupted tooth before application of the forceps.
- Larger straight elevators are used to displace roots from their sockets and are also used to luxate teeth that are more widely spaced or once a smaller-sized straight elevator becomes less effective.
- The most commonly used large straight elevator is the No. 34S, but the No. 46 and the No. 77R are also used occasionally.

*Figure 6-32 A, Straight elevators are the most commonly used elevators. B and C, The blade of the straight elevator is concave on its working side.*
2) **the triangle or pennant-shape type (Figure 6-34):**

- The second most commonly used type of elevator is the triangular elevator.
- These elevators are provided in pairs: a left and a right.
- The triangular elevator is most useful when a broken root remains in the tooth socket and the adjacent socket is empty.
- A typical example would be when a mandibular first molar is fractured, leaving the distal root in the socket but the mesial root removed with the crown. The tip of the triangular elevator is placed into the socket, with the shank of the elevator resting on the buccal plate of bone. The elevator is then turned in a wheel-and-axle rotation, with the sharp tip of the elevator engaging the cementum of the remaining distal root; the elevator is then turned, and the root is delivered.
- The Cryer elevator is the most common type (pairs of these elevators are also commonly referred to as “east-west elevators”).

![Image of triangular elevators](image)

**Figure 6-34** Triangular elevators (Cryer) are pairs of instruments and are therefore used for mesial or distal roots.

3) **the pick type, used to remove roots. Have two types:**

a) The heavy version of the pick is the Crane pick (Figure 6-35).

- This instrument is used as a lever to elevate a broken root from the tooth socket.
- Usually, it is necessary to drill a hole with a bur (purchase point) approximately 3 mm deep into the root just at the bony crest.
- The tip of the pick is then inserted into the hole, and with the buccal plate of bone as a fulcrum, the root is elevated from the tooth socket.

b) the root-tip pick or the apex elevator (Figure 6-36).

- a delicate instrument that is used to tease small root tips from their sockets.
- It must be emphasized that this is a thin instrument and should not be used as a wheel-and axle or lever type of elevator such as the Cryer elevator or the Crane pick.
- The root tip pick is used to tease the very small root end of a tooth by inserting the tip into the periodontal ligament space between the root tip and the socket wall.
Figure 6-35 The Crane pick is a heavy instrument used to elevate whole roots or even teeth after the purchase point has been prepared with a bur.

Figure 6-36 The delicate root-tip pick is used to tease root tip fragments from the socket used improperly.

**Periotomes (Figure 6-37).**

Periotomes are instruments used to extract teeth while preserving the anatomy of the tooth’s socket. The general principle behind their use is to sever some of the periodontal ligaments of the tooth to facilitate its removal.

- The tip of the periotome blade is inserted into the periodontal ligament space and advanced using pressure in the apical direction along the long axis of the tooth.
- It is advanced about 2 to 3 millimeters (mm) and then removed and reinserted into an adjacent accessible site.
- The process is continued around the tooth, gradually advancing the depth of the periotome tip while progressing apically.
- Once sufficient severance of periodontal ligaments has been accomplished, the tooth is removed by using a dental elevator, extraction forceps, or both, taking care to avoid excessive expansion or fracture of bone.
Extraction Forceps

The extraction forceps are instruments used for:

1) removing the tooth from alveolar bone.
2) Ideally, forceps are used to lift elevator-luxated teeth from their sockets, rather than to pull teeth from their sockets.
3) They also can help to expand bone when properly used.

The basic components of dental extraction forceps are: (Figure 6-38)

1) the handle
2) hinge
3) beaks

Figure 6-37 A periotome that has a handle and exchangeable blades. Other types of periotomes have fixed blades or are connected to a motor.

Figure 6-38 Basic components of extraction forceps.
The handles of the forceps are held differently, depending on the position of the tooth to be removed:

1) Maxillary forceps are held with the palm underneath the forceps so that the beak is directed in a superior direction (Figure 6-39).

2) The forceps used for removal of mandibular teeth are held with the palm on top of the forceps so that the beak is pointed down toward teeth (Figure 6-40).

Figure 6-39 Forceps used to remove maxillary teeth are held with the palm under the handle.

Figure 6-40 A, Forceps used to remove mandibular teeth are held with the palm on top of forceps. B, A firmer grip for delivering greater amounts of rotational force can be achieved by moving the thumb around and under the handle.
Two distinct types of hinge present in the forceps:

1) The usual American type of forceps has a hinge in a horizontal direction and is used as has been described.

2) The English preference is for a vertical hinge and a corresponding vertically positioned handle. Thus, the English-style handle and hinge are used with the hand held in a vertical direction as opposed to a horizontal direction.

Figure 6-42 A, English style of forceps have the hinge in the vertical direction. B, English style of forceps are held in the vertical direction.
The beaks of the extraction forceps are the source of the greatest variation among forceps. The beak is designed to adapt to the tooth root near the junction of the crown and root.

It must be remembered that the beaks of the forceps are designed to be adapted to the root structure of the tooth and not to the crown of the tooth.

The more closely the beaks of the forceps adapt to the tooth roots, the more efficient is the extraction and the lower is the chance for undesired outcomes.

A final design variation is in the width of the beak:

1) Some forceps beaks are narrow because their primary use is to remove narrow teeth such as incisor teeth. Forceps designed to remove a lower incisor can theoretically be used to remove a lower molar, but the beaks are so narrow that they will be inefficient for that application.

2) Other forceps beaks are broader because the teeth they are designed to remove are substantially wider, for example, lower molar teeth. The broad molar forceps will not adapt to the narrow space occupied by the lower incisor and, therefore, cannot be used in that situation without damage to adjacent teeth.

The beaks of forceps are angled such that they can be placed parallel to the long axis of the tooth, with the handle in a comfortable position. Therefore:

1) The beaks of maxillary forceps are usually parallel to the handles.

2) The beaks of mandibular forceps are usually set perpendicular to the handles, which allows the surgeon to reach lower teeth and maintain a comfortable, controlled position.

Maxillary forceps

The removal of maxillary teeth requires the use of instruments designed for single-rooted teeth and for teeth with three roots:

1) Maxillary incisors, canine teeth, and premolar teeth are considered single-rooted teeth.

2) The maxillary first premolar frequently has a bifurcated root, but because this occurs in the apical one third, it has no influence on the design of the forceps.

3) The maxillary molars have trifurcated roots, and there are extraction forceps that will adapt to that configuration.

The types of maxillary forceps used for maxillary teeth:

1) single-rooted maxillary teeth
   - **No. 150 (Figure6-43).**
     - After proper elevation they are usually removed with maxillary universal forceps, usually No. 150 (Figure6-43).
     - The No. 150 forceps are slightly S-shaped when viewed from the side and are essentially straight when viewed from above. The
     - beaks of the forceps curve to meet only at the tip.
     - The slight curve of the No. 150 allows the operator to comfortably reach not only incisors but also premolars.

2) maxillary premolar teeth
   - **No. 150A (Figure6-44)**
     - The beaks of the No. 150 forceps come in a style that has been modified slightly to form the No. 150A (Figure6-44) forceps useful for maxillary premolar teeth and should not be used for incisors because of its poor adaptation to the roots of incisors.
3) Maxillary incisors and canines
   - **The No. 1 forceps (Figure 6-45)**
     ✓ which can be used for maxillary incisors and canines, are easier to use compared with the No. 150 for upper incisors.

4) Maxillary molar teeth
   - the molar forceps come in pairs: a left and a right, because:
     ✓ Maxillary molar teeth are three-rooted teeth, with a single palatal root and a buccal bifurcation.
     ✓ Therefore, forceps that are specifically adapted to fit maxillary molars must have a smooth, concave surface for the palatal root and a beak with a pointed design that will fit into the buccal bifurcation.
     ✓ This requires that the molar forceps come in pairs: a left and a right.
     ✓ Additionally, the maxillary molar forceps should be offset so that the surgeon can reach the posterior aspect of the mouth and remain in the correct position.
   - **No. 53 right and left (Figure 6-46).**
     ✓ The most commonly used molar forceps are the No. 53 right and left.
     ✓ These forceps are designed to fit anatomically around the palatal beak, and the pointed buccal beak fits into the buccal bifurcation.
     ✓ The beak is offset to allow for good surgeon positioning.
   - **No. 88 right and left forceps (Figure 6-47).**
     ✓ A design variation is shown in the No. 88 right and left forceps, which have a longer, more accentuated, pointed beak formation.
     ✓ They are particularly useful for maxillary molars with crowns that are severely carious. The sharply pointed beaks may reach deeper into the trifurcation to sound dentin.
     ✓ The major disadvantage is that they crush crestal alveolar bone, and when used on intact teeth without due caution, fracture of large amounts of buccal alveolar bone may occur.
   - **The No. 210S forceps (Figure 6-48).**
     ✓ On occasion, maxillary second molars and erupted third molars have a single conical root. In this situation, forceps with broad, smooth beaks that are offset from the handle can be useful. The No. 210S forceps exemplify this design.
   - **The No. 65, are also known as root-tip forceps (Figure 6-49).**
     ✓ the offset molar forceps with very narrow beaks.
     ✓ These forceps are used primarily to remove broken maxillary molar roots but can be used for the removal of narrow premolars and for lower incisors.

5) Maxillary primary (deciduous) teeth
   - **No. 150S (Figure 6-50).**
     ✓ A smaller version of the No. 150
     ✓ These forceps adapt well to all maxillary primary teeth and can be used as universal primary tooth forceps.
Figure 6-43  

A, Superior view of No. 150 forceps.  
B, Side view of No. 150 forceps.

Figure 6-44  

A, Superior view of No. 150A forceps.  
B, No. 150A forceps have parallel beaks that do not touch in contrast to No. 150 forceps beak.  
C, Adaptation of No. 150A forceps to the maxillary premolar.
Figure 6-45  
A, Superior view of No. 1 forceps. B and C, No. 1 forceps adapted to the incisor.

Figure 6-46  
A, Superior view of No. 53L forceps. B, Oblique view of No. 53L forceps

C, Right, No. 53L; left, No. 53R. D and E, No. 53L adapted to the maxillary molar.
Figure 6-47  A, Superior view of No. 88L forceps. B, Side view of No. 88L forceps. C, No. 88R adapted to the maxillary molar.

Figure 6-48  A, Superior view of No. 210S forceps. B, Side view of No. 210S forceps. C, No. 210S adapted to the maxillary molar.
Figure 6-49  
A, Superior view of No. 65 forceps.  
B, Side view of No. 65 forceps.  
C, No. 65 adapted to broken root.

Figure 6-50  
The No. 150S forceps (bottom) are a smaller version of the No. 150 forceps (top) and are used for primary teeth.
Mandibular forceps
Extraction of mandibular teeth requires forceps that can be used for single-rooted teeth for the incisors, canines, and premolars, as well as for two-rooted teeth for the molars.

The types of mandibular forceps used for mandibular teeth:
1) the single-rooted teeth
   - **lower universal forceps or the No. 151 (Figure 6-51).**
     ✓ most commonly used for the single-rooted teeth.
     ✓ These forceps have handles similar in shape to the No. 150, but the beaks are pointed inferiorly for lower teeth.
     ✓ The beaks are smooth and narrow and meet only at the tip. This allows the beaks to fit near the cervical line of the tooth to grasp the root.
   - **English style of vertical-hinge forceps (Figure 6-53).**
     ✓ can be used for the single-rooted teeth in the mandible Great force can be generated with these forceps.
     ✓ Unless great care is exercised, the incidence of root fracture is higher with this instrument.
2) Mandibular premolar teeth
   - **No. 151A forceps (Figure 6-52).**
     ✓ These forceps should not be used for other lower teeth because their form prevents adaptation to the roots of teeth.
3) Mandibular molars
   - Mandibular molars are bifurcated, two-rooted teeth that allow the use of forceps that anatomically adapt to the tooth.
   - Because the bifurcation is on the buccal and the lingual sides, only a single molar forceps are necessary for the both sides, in contradistinction to the maxilla, for which a right- and left-paired molar forceps set is required.
   - **No. 17 forceps (Figure 6-54).**
     ✓ Useful lower molar forceps.
     ✓ The beaks have pointed tips in the center to be set into the bifurcation of lower molar teeth.
     ✓ Because of the pointed tips, the No. 17 forceps cannot be used for molar teeth which have fused conical roots.
   - **No. 151 forceps**
     ✓ used for molar teeth which have fused conical roots.
   - **No. 87, the so-called cowhorn forceps (Figure 6-55).**
     ✓ Have major design variation
     ✓ These instruments are designed with two pointed, heavy beaks that enter the bifurcation of lower molars.
     ✓ After the forceps are seated into the correct position, usually while gently pumping the handles up and down, the tooth is actually elevated by squeezing the handles of the forceps together tightly.
     ✓ As the beaks are squeezed into the bifurcation, they use the buccal and lingual cortical plates as fulcrums, and the tooth can be literally squeezed out of the socket.
As with the English style of forceps, improper use of the cowhorn forceps can result in an increase in the incidence of untoward effects such as fractures of alveolar bone or damage to maxillary teeth if the forceps are not properly controlled by the surgeon as the molar exits the socket.

The beginning surgeon should, therefore, use the cowhorn forceps with caution.

4) mandibular primary (deciduous) teeth
   - The No. 151 is also adapted for primary teeth.
   - No. 151S forceps (Figure 6-56).
     - the same general design as the No. 151 but is scaled down to adapt to primary teeth.
     - These forceps are adequate for the removal of all primary mandibular teeth.

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![Figure 6-51](image1)

**Figure 6-51** A, Superior view of No. 151 forceps. B, Side view of No. 151 forceps. C, No. 151 forceps adapted to the mandibular incisor.

![Figure 6-52](image2)

**Figure 6-52** A, The No. 151A forceps have beaks that are parallel and do not adapt well to roots of most teeth, in contrast to the No. 151 forceps beaks. B, No. 151A forceps adapted to a lower premolar tooth. The lack of close adaptation of the tips of the beak to the root of the tooth is shown.
Figure 6-53 A, Side view of the English style of forceps. B, Forceps adapted to the lower premolar.

Figure 6-54 A, Superior view of No. 17 molar forceps. B, Side view of No. 17 molar forceps. C and D, No. 17 forceps adapted to the lower molar.
Figure 6-55  
A, Superior view of cowhorn No. 87 forceps.  
B, Side view of cowhorn forceps.  
C and D, Cowhorn forceps adapted to the lower molar tooth.

Figure 6-56  
The No. 151S forceps (bottom) are the smaller version of the No. 151 forceps (top) and are used to extract primary teeth.