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Dental Elevators

Elevators are single-bladed instrument used as lever or wedges, placed between tooth and bone to luxate the tooth or root from socket along the line of withdrawal and away from the point of application (Pedlar and Frame, 2007).

Component of dental elevators (Hupp *et al.*, 2014):

1- Handle: this part is large enough to be hold comfortably in hand to apply controlled force. It can be either straight or crossbar in shape (T-bar).
2- Shank: the shank connects the handle to the working end and it's strong to be able to transmit the applied forces.
3- Working end (Blade): this part forms the tip of the elevator and it's used to apply forces to the tooth, bone or both (Fig.1).

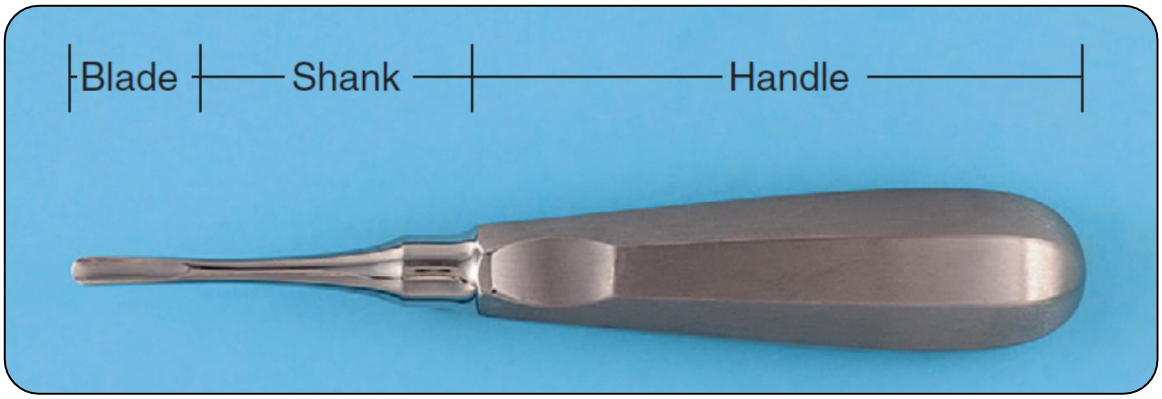

Figure 1 The major components of an elevator are the handle, the shank and the blade (Hupp *et al.*, 2014)

Uses of elevators (Hupp *et al.*, 2014):

1- To luxate teeth from surrounding bone.
2- To expand the alveolar bone.
3- Remove of broken roots
4- Remove of surgically sectioned roots

Types of Elevators:

1- Straight elevators

a. Luxators: This is the most common elevators. It's used to luxate teeth prior to extraction and to displace roots from the sockets (by wedging action). The blade of the luxator has an inner concave surface which is placed against the tooth and a rounded working end. The blade of the luxator may have a slight angle near the shank to allow its use in more posterior part of the mouth (Hupp *et al*., 2014) (Fig.2).

Figure 2 The straight elevator, the blade is concave on its working side and may have slight angle near the shank (Hupp *et al*., 2014)

b. Coupland chisel: It has similar shape of the luxator, but the tip is sharper and has straight-cut. Depending on the width of the working end, there are different sizes including: Size 1, 2 and 3. Coupland chisel can be used to elevate teeth (by leverage action) and separate teeth. It can also remove bone to create point of application (Fig.3).

Figure 3 Coupland chisel having a straight-cut tip

2- Triangular-type elevator:

These are the second most common type. These elevators usually come in right and left pairs with different angulations, all having a triangular working end, with the most commonly used are Cryer's elevators (East-west elevators)(Fig.4). The triangular elevators can be used to remove fractured roots when there is an adjacent empty socket. For example, when a distal root of a mandibular molar is removed while the mesial is still in place, the Cryer can be inserted in the distal socket and then slightly rotated (by wheel and axis action). The tip of the elevator will remove some inter-septal bone and then engages the cementum of the mesial root. By this movement the root can be delivered (Hupp *et al.*,2014) (Fig.5).

Figure 4 Triangular elevators, a pair of Cryer's elevators (Hupp *et al.*, 2014)

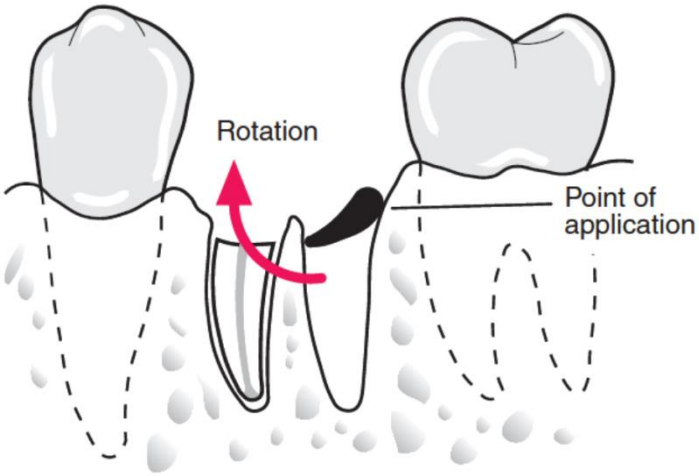

Figure 5 Removal of mesial root of a lower first molar (Pedlar and Frame, 2007)

3- Pick-Type Elevators:

This is uncommon type of elevators. It has two versions. A heavy version known as Crane Pick (Fig.6) and a smaller version known as root-tip pick (Fig.7).

Crane pick can remove roots from the socket, after a purchase point is prepared by drilling a hole into the root (Fig.8). The root-tip pick is a delicate instrument used to displace small root tips from the socket (Hupp *et al*., 2014).

Figure 6 The heavy version of the Pick-type elevators, The Crane Pick (Hupp *et al.*, 2014)

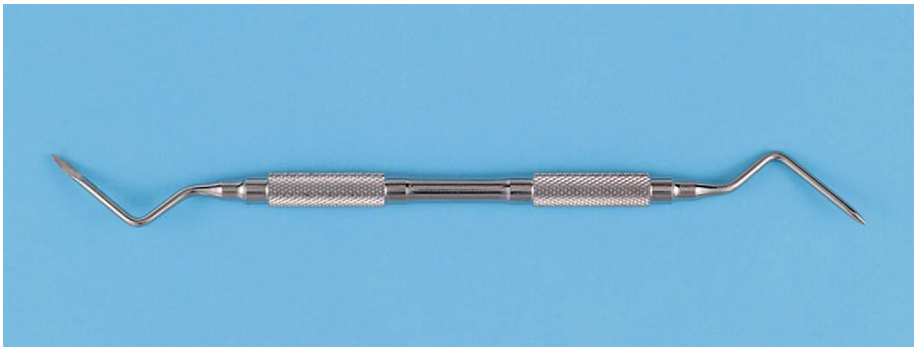

Figure 7 The small version of the Pick-type elevators, The Root-tip Pick (Hupp *et al.*, 2014)

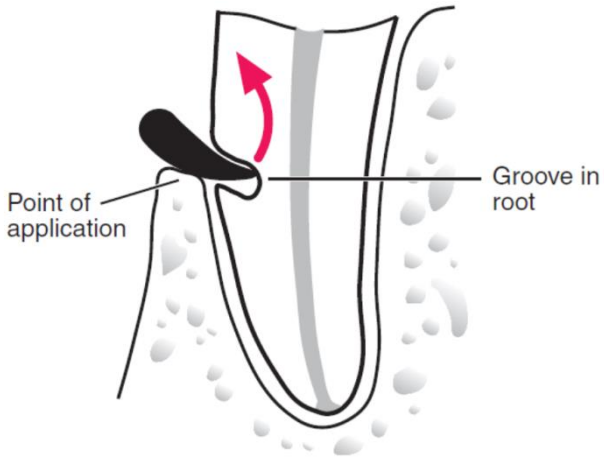

Figure 8 Removal of a lower retained root after drilling a hole for placement of the elevator (Pedlar and Frame, 2007)

4- Other Type:

a. Warwick James: This type comes in three different shapes two angled (Right and Left) and straight one; all of them have flat handle and a short rounded working end (Fig.9). The angled Warwick-James are suitable for elevation of retained roots of deciduous teeth (Fig. 10), while the straight one is used for elevation of disto-angular maxillary 3rd molar (Pedlar and Frame, 2007).

Figure 9 A pair of angled Warwick James elevators (Right and Left), having flat handles and short rounded working ends

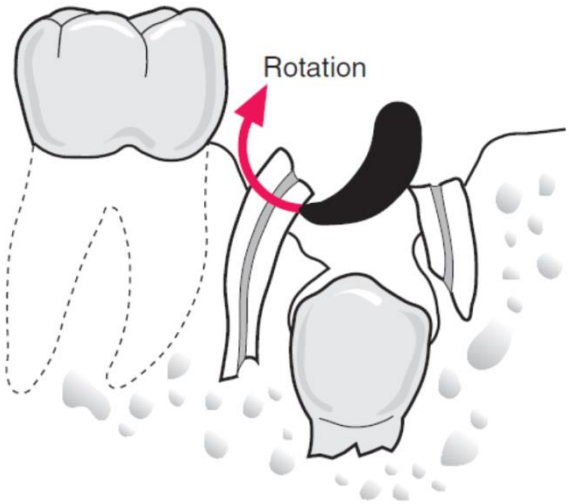

Figure 10 Removal of deciduous molar roots with a curved Warwick James elevator (Pedlar and Frame, 2007)

b. Apexo Elevators: These are double angled elevators, having two angles at the shank. The working end is concave and ends with pointed-tip. These elevators are useful for removal of root tips (Fragiskos, 2007).

Figure 11 A Pair of Apexo Elevators (Fragiskos, 2007)

c. Winter T-Bar (Cross bar) Elevator: The Shank of this elevators is connected to the middle of the handle, giving the elevator a T-shape appearance and comes in pairs (Right and left). Their working-end can be either fine with pointed tip or triangular similar to Cryer elevators. This elevator is used by Wheel and axis motion to remove roots of molar teeth in lower jaw or to remove a whole lower third molar (Fragiskos, 2007). This type of elevators must be used with great caution as they generate an excessive amount of forces (Hupp *et al*., 2014).

Figure 12 Cross bar elevator with different working ends, a Pointed tip (left) and Triangular tip (right)

Principles of elevators usage (Pedlar and Frame, 2007):

1- The elevator should be held in the palm of the dominant hand with the index finger along its axis (Fig.13).

2- The elevator must be supported to prevent slippage and subsequent injury to the patient or the operator.

3- When the elevator is used, the fulcrum on which it rests should always be a bony one. The fulcrum should never be an adjacent tooth, unless it's to be extracted at the same visit, as this will damage it (Fig.14).

Figure 13 Correct handling of an Elevator (Pedlar and Frame,2007)

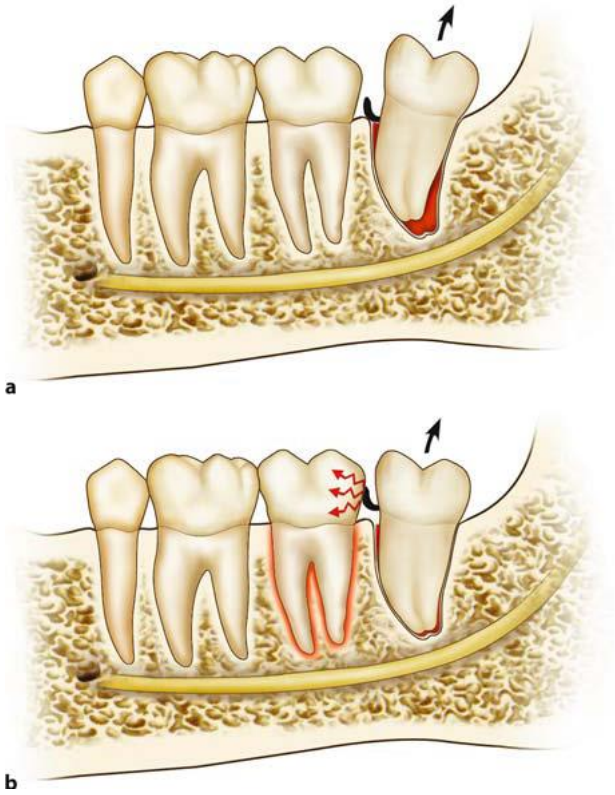

Figure 14 (a) Correct placement on a Bony Fulcrum,(b) incorrect use of adjacent tooth as a fulcrum (Fragiskos, 2007)

Desmotomes

These instruments are used for separation of the surrounding soft tissue attachment from the tooth to be extracted. Those can be either straight or curved (Fragiskos, 2007)(Fig.15).

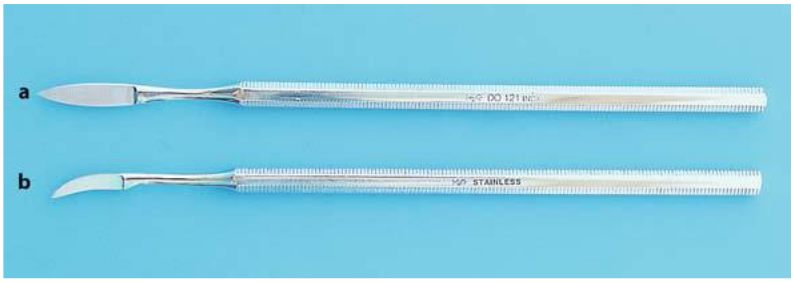

Figure 15 Desmotomes, (a) Straight and (b) Curved (Fragiskos, 2007)

Periotomes

Periotomes are used for extraction of teeth with minimum trauma to the surrounding bone. The instrument has a small tip; allowing it to be inserted into the periodontal ligament space to sever the periodontal ligament attachment, and then the tooth can be removed with an aid of elevators or forceps (Hupp *et al*., 2014)(Fig.16).

Figure 16 a periotome that has a handle and exchangeable blades (Hupp *et al*., 2014)

References:

Fragiskos. (2007). *Oral Surgery.* Germany: Springer.

Hupp, J. R., Ellis III, E., & Tucker, M. R. (2014). *Contemporary Oral and Maxillofacial Surgery* (6th ed.). China: Elsevier.

Pedlar, J., & Frame, J. W. (2007). *Oral and Maxillofacial Surgery* (2nd ed.). China: Elsevier.