UNIVERSITY OF WASHINGTON
School of Dentistry
Department of Orthodontics

FORCED ERUPTION (ORTHODONTIC EXTRUSION)

Rational: Changes the placement of a fractured/diseased tooth to a supra-crestal position, preventing a planned restoration from impinging on the biologic width.

Criteria

1. Root length
   - Must end up with 1:1 crown:root ratio
   - Must allow adequate biologic width (~1mm connective tissue attachment, ~1mm gingival attachment, ~1mm sulcular depth)
   - Generally you need ~2.5 mm from planned restoration to crestal bone level plus at least 1.5mm of tooth structure for resistance form (ferrule effect)

   Total eruption must be around (2.5 mm + 1.5 mm) = **4mm** above crestal bone

2. Root form
   - External—preferably broad, non-tapering root form

   Thin and tapered roots have poor emergence form because the new CEJ is lower and thinner than the contralateral tooth

   - Internal—width of root canal must have enough internal pulpal wall

   Canal space must be at least 1/3 the width of the tooth (measure 4mm below the margin because you need to extrude to ~4mm)

3. Level of Fracture
   - Important for ease of orthodontic traction (difficult to work sub-gingival)

4. Importance of Tooth
   - How old is the patient? How long does the tooth need to last? Does the restoration need to be more esthetic or more functional? Are the adjacent teeth restored? What is the long-term prognosis of the planned restoration? Does the patient understand the total cost of saving the tooth in question (orthodontics + periodontics + restorative)?

5. Esthetics
   - Evaluate the patients lip level on resting and smiling. Saving natural tooth structure is of more value in high lip line patients because pontics generally are less esthetic.

6. Endodontic and Periodontic prognosis
   - Vertical fractures have poor prognoses
   - Teeth with multiple-wall periodontal defects have poorer prognoses

Technique

1. Use heavy traction for fastest eruption possible
   - Goal: maximum stretch of PDL principal fibers, bone below erupting tooth will regenerate over time
   - Fast eruption prevents immediate formation of bone around new CEJ (crestal fibers stretched)
   - You must do a supracrestal fiberotomy and/or crown lengthening to prevent the formation of bone near new CEJ (need ~4mm of tooth above bone level)

2. Cement a hook of 0.036" SS wire in endodontically-treated root fragments to provide a centered attachment

3. If brackets are used, you must provide anchorage support for the extrusion—a minimum of one tooth on either side of a single-rooted tooth (2 anchors) or two teeth on either side of a multi-rooted tooth (4 anchors). Use a heavy square or rectangular NiTi wire to minimize tipping.

4. Evaluate occlusion to be sure extruded teeth do not cause traumatic occlusion. You may need to open the bite during the extrusion or trim the extruded tooth.

5. Be sure you assess the need for a supracrestal fiberotomy (cutting the periodontal ligament fibers near the crown of the tooth) and/or crown lengthening after your extrusion. If you have pulled the tooth out of the bone, you will need to perform or refer this minor surgery.

6. Once the extrusion has been completed, stabilize the tooth and hold for 4-6 months before restoring for optimal esthetics and stability. Remember the tooth may potentially relapse in an apical direction. Bonded retainers are the best way to ensure long-term retention