

# SILVER LINING FOR THE PERISHING MULTIROOTED TEETH: HEMISECTION

## INTRODUCTION

Hemisection is an under-practiced clinical option. Often overlooked due to lack of knowledge and clinical judgement. For a better understanding, hemisection may be explained as a process akin to amputation of a gangrenous unsalvageable limb in order to save life. The same analogy applies to certain multirooted teeth wherein, a single root maybe sacrificed in order to retain the other half as a fully functioning tooth in itself after proper periodontic, endodontic and prosthodontic intervention.

## CASE REPORT

A 37 year old male patient reported to the clinic with severe pain on chewing in the lower left back tooth. History revealed that he had previously undergone root canal treatment of the same tooth 3 years earlier. On intraoral examination, 36 showed a fractured restoration and was tender to percussion. The distal gingiva was inflamed. On radiographic examination, the tooth showed secondary caries beneath the fractured restoration, extending subosseously approaching the furcation region. There were inadequately filled root-canals with loss of lamina dura periapically. Treatment options included extraction of 36 followed by placement of implant, fixed partial denture or removable partial denture. As the patient was unwilling for extraction, hemisection of the distal root of 36 followed by prosthetic replacement, was suggested. The patient immediately agreed to this and it was decided that the distal root would be hemisected after completion of the endodontic therapy.

CLINICAL PROCEDURE: After having decided on the chosen treatment plan, endodontic therapy was instituted. The gutta-percha was first removed using gutta-percha solvent (Carvene, Prevest Denpro) and H-files (Dentsply, Mallifer). The distal canal was subsequently found to have un-negotiable ledges from previous instrumentation. The irrigation protocol used included warm 5% sodium hypochlorite (Hyposol, Prevest, Denpro), followed by 17% EDTA (Prevest Denpro), finally followed by 2% chlorhexidine solution (Chlor X, Prevest Denpro). The mesial canals were prepared till F1 protaper (Dentsply, Mallifer).

In the same visit hemisection of the distal root and crown was done with a vertical cut method. The crown was cut with a long shank, tapered fissure carbide bur till the furcation was reached. Once the separation was complete, the distal half was extracted. The empty socket was thoroughly irrigated. After the complete healing of the extraction socket the mesial



half was filled with flowable, dual-cure, nano-tech core build-up composite (Fusion core DC flow, Prevest Denpro). Tooth preparation for metal fused to ceramic crowns was done on mesial half of 36 and 37. Impression of the same was made with dual impression triple-tray technique using polysiloxane putty and light body (Hiflex silky touch, Prevest Denpro).

The fixed partial denture which replaced 36 as two premolars instead of a single molar using mesial half of 36 and 37 as abutment was luted using fine particle glass ionomer cement (Micron luting, Prevest Denpro).

## **DISCUSSION**

Root amputation/hemisection is a great alternative procedure to save those multi-rooted teeth which would have been doomed otherwise. Correct case selection requires proper evaluation of the patient's oral hygiene status, caries index and medical status.

### *Therapeutic Protocol for Root Resection*

A complete medical and dental history, thorough clinical and radiographic evaluations including periapical radiographs, diagnostic casts and consultation with the restorative dentist should be carried out. Treatment options should be presented to the patient, and the potential problems should be discussed. The decision concerning the final treatment to be performed should be made after the effects of the cause-related therapy have been evaluated.

Weine has listed the following indications for tooth resection:

### *Periodontal Indications*

1. Severe vertical bone loss involving only one root of multi-rooted teeth.
2. Through and through furcation destruction.
3. Unfavourable proximity of roots of adjacent teeth, preventing adequate hygiene maintenance in proximal areas.
4. Severe root exposure due to dehiscence.

### *Endodontic and Restorative Indications*

1. Prosthetic failure of abutments within a splint: If a single or multirooted tooth is periodontally involved within a fixed bridge, instead of removing the entire bridge, if the remaining abutment support is sufficient, the root of the involved tooth is extracted.

2. Endodontic failure: Hemisection is useful in cases in which there is perforation through the floor of the pulp chamber, or pulp canal of one of the roots of an endodontically involved tooth which cannot be instrumented.
3. Vertical fracture of one root: The prognosis of vertical fracture is hopeless. If vertical fracture traverses one root while the other roots are unaffected, the offending root may be amputated.
4. Severe destructive process: This may occur as a result of furcation or subgingival caries, traumatic injury, and large root perforation during endodontic therapy.

#### *Contraindications*

1. Poorly shaped roots or fused roots.
2. Poor endodontic candidates or inoperable endodontic roots.
3. Patient unwilling to undergo surgical and endodontic treatments and undertake the care of the resulting restoration.

A dental practitioner needs to keep in mind that a restoration may contribute to periodontal destruction, if the margins are defective or if non-occlusal surfaces do not have physiologic form. Also, an improperly shaped occlusal contact area may convert acceptable forces into destructive forces and predispose the tooth to trauma from occlusion and ultimate failure of hemisection. In the case reported, the occlusal table was reduced further using two premolars instead of a single molar, thereby reducing the amount of forces being transmitted to the abutments. Lateral forces were reduced by making cuspal inclines less steep and eliminating balancing incline contacts.

#### **CONCLUSION**

Hemisection may be a suitable alternative to extraction and implant therapy and should be discussed with patients during consideration of treatment options after proper case selection.

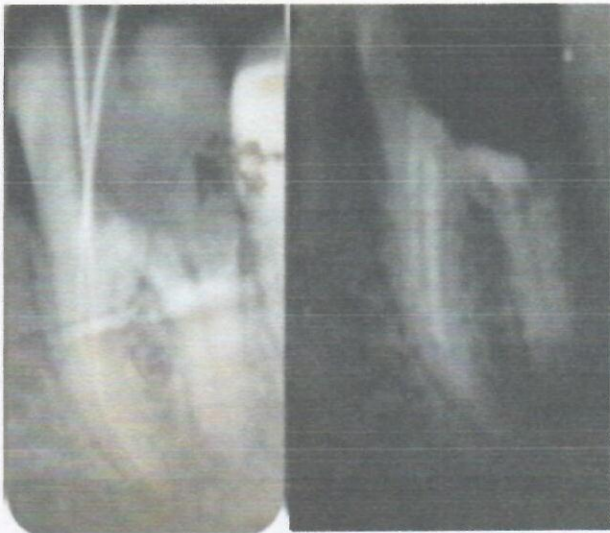
Figures:





**FIGURE 1**

Figure 1: Preoperative clinical picture and radiograph showing fractured coronal restoration with secondary caries in the distal root and inadequate root canal obturation.



**FIGURE 2**

Figure 2: Removal of gutta-percha from the root canals followed by working length determination, biomechanical preparation and obturation in mesial canals.

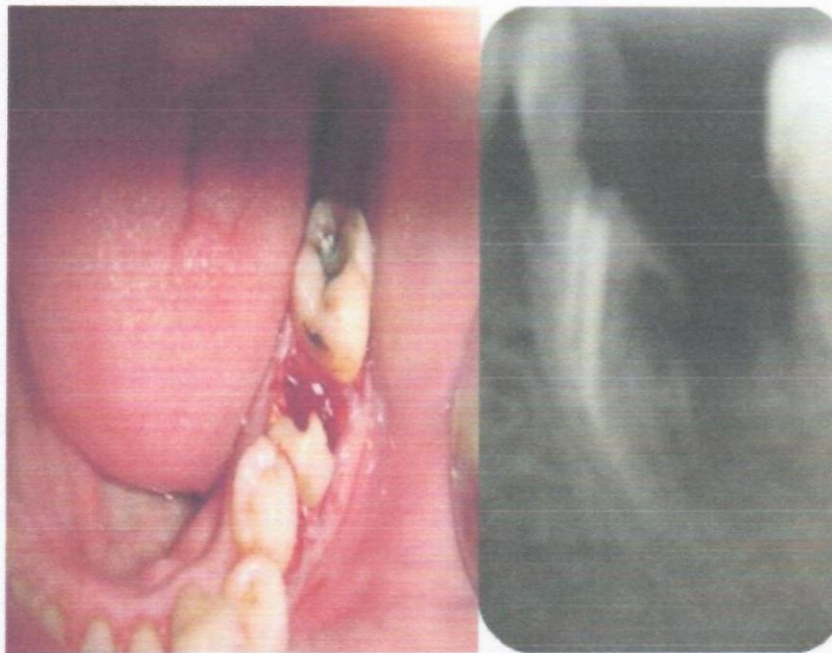


FIGURE 3

Figure 3: Amputation distal root

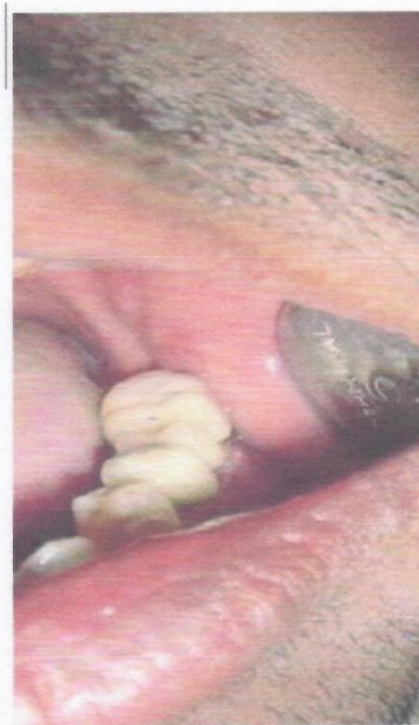


FIGURE4

Figure 4: Fixed partial metal fused to ceramic denture post luting