# INTERDISCIPLINARY APPROCH

## HEMISECTION - A CASE REPORT [Endodontics, Periodontics]


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**Introduction:**

The treatment, management and long-term retention of mandibular molar teeth exhibiting furcation invasions (FI) have always been a challenge to the discerning general dentist or dental specialist. The treatment may involve combining Restorative dentistry, Endodontics and Periodontics so that the teeth are retained in whole or in part. Such teeth can be useful as independent units of mastication or as abutments in simple fixed bridges. Continued periodontal breakdown may lead to total loss of tooth unless these defects can be repaired or eliminated and health of the tissues restored. Thus tooth separation and resection procedures are used to preserve as much tooth structure as possible rather than sacrificing the whole tooth.[1]

Definition: Hemisection refers to sectioning of the crown of a lower molar, with either the removal of one half of the crown and its supporting root structures, or the retention of both the halves, to be used after reshaping and splitting as two premolars.[6]

Success of hemisection procedures depend, to a large extent, on proper case selection. It is important to consider the following factors before deciding to undertake any of the separation procedures.[5]

1) Advanced bone loss around one root with acceptable level of bone around the remaining roots.

2) Angulation and position of the tooth in the arch

3) Divergence of the roots - teeth with divergent roots are easier to separate. Closely approximated or fused roots are poor candidates.

4) Length and curvature of roots - long and straight roots are more favourable for separation than short, conical roots.

5) Feasibility of endodontics and restorative dentistry in the root/roots to be retained.

However, there are few disadvantages associated with it. 1) Root surfaces that are reshaped by grinding in the furcation or at the site of hemisection are more susceptible to caries. 2) Failure of endodontic therapy due to any reason will cause failure of the procedure. 3) In addition, when the tooth has lost part of its root support, it will require a restoration to permit it to function independently or to serve as an abutment for a splint or bridge. 4) Unfortunately, a restoration For a splint or bridge. 4) Unfortunately, a restoration can contribute to periodontal destruction, if the margins are defective or if non-occlusal surfaces do not have physiologic form. 5) 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.

Weine[2] has listed the following indications for tooth resection

I) Periodontal Indications: Severe vertical bone loss involving only one root of multi-rooted teeth, Through and through furcation destruction, Unfavourable proximity of roots of adjacent teeth, preventing adequate hygiene maintenance in proximal areas, Severe root exposure due to dehiscence.

II) Endodontic and Restorative Indications: Root caries involving almost half of the root, Any mechanical obstruction or broken instrument involving half of the root, 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, 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 amputed, Severe destructive process: This may occur as a result of furcation or sub. gingival caries, traumatic injury, and large root perforation during endodontic therapy.

CONTRA INDICATIONS: Strong adjacent teeth available for bridge abutments as alternatives to hemisection. Inoperable canals in root to be retained, Long bridge span where abutment tooth would have inadequate support, Bone loss involving more than one root, Root fusion-making separation impossible

Case Reports:

A 35 years old woman reported to the department of conservative and endodontics, College of Dental Sciences, Davangere with the complaint of pain and mobility of left lower back tooth. On examination, the left mandibular first molar was sensitive to percussion and revealed grade 2+ mobility. On probing the area, there was a 10mm deep periodontal pocket around the distal root of the tooth.

On radiographic examination, severe vertical bone loss was evident surrounding the distal root and involving the furcation area. The bony support of mesial root was completely intact (Fig. 1). It was decided that the distal root should be hemisected after completion of endodontic therapy of the tooth.[4]

The working length was determined with Root ZX apex locator and the canals were biomechanically prepared using Protaper Ni-Ti rotary crown down technique. The canals were obturated with lateral condensation method and the chamber was filled with composite to maintain a good seal and allow interproximal area to be properly contoured during separation (Fig.2, 3).

We opted for non surgical resection of the tooth as it was desired by the patient. An arbitrary marking with blue marker was made on exposed bifurcation area from lingual to buccal side. Mesiodistal dimension of tooth was measured both intraorally and on radiograph. An estimation of mesiodistal portion to be resected was made. The vertical cut method was used to resect the crown.[7] A long shank tapered fissure carbide bur was used to make vertical cut toward the bifurcation area. A fine probe was passed through the cut to ensure separation (Fig.4)

The distal root was extracted and the socket was irrigated adequately with sterile saline to remove bony chips and periodontal irritation. Scaling and root planning of the root surfaces, which became accessible on removal of distal root was done. The extraction site was irrigated . The occlusal table was minimized to redirect the forces along the long axis of the mesial root (Fig5)

Patient has been advised 3-5 weeks follow up for observing complete healing of the tissues. A fixed bridge involving retained mesial half and mandibular second molar with sanitary pontic has been planned. (Fig.6).

Discussion : Advances in dentistry, as well as the increased desire of patients to maintain their dentition, have lead to treatment of teeth that once would have been extracted. In order to carry out this present day mandate, periodontally diseased teeth with severe bone loss at furcation area may well be retained by hemisection, bicuspidization, and root resection. This article describes a simple procedure for hemisection in mandibular molar and its subsequent restoration.

**Reference:**


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Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

**Congratulations to our College Principal Dr. V. V Subba Reddy for becoming Chief Editor for Journal of Indian Society of Pedodontics and Preventive Dentistry for the year 2009 to 2013.**