

# Periodontology

## Hemisection an Alternative to Extraction - Practice Management



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## Abstract

The recent advances in health care services has increased our life expectancy and so is true with the periodontally involved tooth. The tooth affected by severe periodontitis with furcation involvement can be treated by procedures such as root resection or hemisection. Hemisection is surgical sectioning of the tooth into two parts with removal of the affected root . Splitting of tooth with two roots into separate parts is called as bicuspidisation. The root and corresponding crown can be then be restored to function by fabrication of prosthesis. Endodontic therapy should be performed prior to the hemisection procedure. It is frequently performed with mandibular 1<sup>st</sup> molar. We report the case of hemisection of right mandibular molar followed by restoration of its function with the help of fixed partial denture.

### || Key Words

Hemisection, molar tooth, periodontal involvement, endodontically treated.

## || Introduction

Recent advancement and newer methods of treatment have greatly increased the life expectancy as well as the survival rate of the natural tooth. The management and treatment of molars having furcation involvement has always remained a challenge in periodontal therapy. Hemisection is the surgical separation of a multi-rooted tooth especially a mandibular molar through the furcation in such a way that a root and the associated portion of the crown can be removed.<sup>(1,5,6)</sup> The most commonly performed root resection is the distobuccal root of maxillary first molar.<sup>(7)</sup> Patients with advanced periodontitis commonly have root resection performed along with other procedures. Functionality of the tooth in the oral cavity is the primary objective of the treatment. This case report is regarding hemisection procedure in mandibular right molar which was planned to be preserved by resection of the distal root and preservation of the mesial root followed by prosthesis to increase functional efficacy.

## || Practice Management

A 48 year old male patient reported to the Department of Periodontology, Government Dental College and Hospital, Mumbai, in the year 2017, with complaint of pain in the mandibular right first molar, since past one month. Clinical examination revealed slight mobility in mandibular right first molar and a 9mm pocket on the distal root (1). The patient insisted on saving of the tooth, hence was advised hemisectioning procedure. A detailed medical history was taken with no relevant findings. On intraoral examination, tooth was tender on percussion and deep occlusal caries were present with a periodontal pocket. Electric vitality was performed and tooth was found to be nonvital. Endodontic treatment was successfully completed. On radiographic examination, well defined radiolucency was visible from the apical to the middle 1/3<sup>rd</sup> of the distal root of mandibular right first molar (Fig. 1). However, the mesial root showed no bone loss, had adequate root length with no osseous defect. Hemisection was decided as the appropriate method of treatment followed by prosthetic rehabilitation

A written consent was obtained before the surgical procedure. Under all aseptic precautions, local anaesthesia consisting of 2% lignocaine with adrenaline was administered. A full thickness



Fig.1: Preoperative radiographic view. Root resorption with distal root of #46



Fig.2: Crown sectioned in buccal and lingual halves



Fig.3: Distal root removed



Fig.4: IOPA after 1 year follow up and prosthetic rehabilitation

mucoperiosteal flap was elevated both on lingual and buccal aspects and a cut was made passing through the post root canal light cure glass ionomer restoration. (Fig. 2). The area was debrided. A vertically oriented through-and-through cut was made through the buccal and lingual developmental grooves along the furcation of the tooth involving the pulp chamber taking into consideration the three factors for total separation, feel, radiograph and movement. Special care was taken not to traumatize the bone on the remaining root or damage the adjacent tooth. The infected distal root was extracted with the help of extraction forceps (Figure 3). The flap was approximated by giving simple loop sutures with the help of 3/0 black silk and a half curved needle. The patient was prescribed with Amoxicillin 500mg TDS and Analgesic (Tab. Diclofenac Sodium and Paracetamol) for 5 days. The patient was recalled for suture removal after 7 days. (Fig. 4) Adequate bone formation was seen at 3 month recall visit with uneventful healing and absence of mobility. Prosthetic rehabilitation was completed by placement of a fixed ceramic prosthesis, thereby restoring the masticatory efficacy. (Fig. 5)

## || Discussion

Hemisection or splitting of the tooth into two parts allows for a molar to be treated as premolar if one affected root is resected or removed. However, the remaining root must be stable and should have a good crown and root ratio. It is a second line of treatment option for salvage of multirooted tooth which may otherwise require an extraction. Hemisection of first

mandibular molar is generally preferred since it has longer and thicker roots and also surgical access is easier than second mandibular molar. The patient's detailed case history including oral hygiene, caries index, occlusion and systemic condition should be evaluated<sup>(5)</sup>. It is important to assess the occlusion, and remove the eccentric forces on the teeth which has undergone resection procedure and, if necessary, occlusal adjustments should be made as the removal of a root alters the distribution of the occlusal forces on the remaining roots<sup>(4,7)</sup>. The mesial roots of mandibular first and second molars often contain two canals, however seldom seen in distal root. Mesial roots of first molar frequently have a curvature towards the distal and sometimes have a groove beginning in furcation area and running apically on the distal aspect. Whenever possible, it is desirable to retain the mesial half of the first molar as depicted in our case. Many practitioners routinely splint the retained mesial half of the tooth to the second premolar. This is usually unnecessary if all periodontal pathosis and occlusal prematurities have been eliminated. In our case report, hemisection was an ideal procedure in which half of the tooth was preserved and was of functional help to the patient in mastication. Thus hemisectioning is used to preserve as much tooth structure as possible rather than sacrificing the whole tooth.<sup>(4,11)</sup>

The root furcation should be accessible for easy separation and good bone support for the remaining root should be evaluated.<sup>(1,6)</sup> Hemisection is a viable option to be considered before the extraction of molars<sup>(5)</sup> specially in the presence of conditions such as severe vertical bone loss (with one root of a multirooted tooth), furcation destruction, root resorption, unfavourable proximity of roots of adjacent teeth, preventing adequate hygiene, maintenance of proximal areas and severe root exposure due to dehiscence. The procedure of root amputation and hemisection are almost similar. The osteoplasty, ostectomy and removal of furcation lip should be performed on the root which is to be retained. When hemisection becomes necessary for other than periodontal reasons the procedure can often be accomplished without reflecting a surgical flap. This not only saves time but also minimizes post operative discomfort. The indications for hemisection are as follows: (a) when there is severe bone loss affecting a multirooted tooth which cannot be treated by regenerative procedure.

(b) severe recession or dehiscence of a root. (c) class two, class three furcation involvement as well as when there is through and through destruction of furcation. (d) if oral hygiene maintenance is difficult in proximal areas due to unfavourable proximity of root of adjacent teeth (e) vertical fracture of one root. (f) if a single or multirrooted 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. (g) when 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. Weine<sup>(12)</sup> has given the contraindication as- if there is strong adjacent teeth available for bridge abutments, inoperable canals in root to be retained and root fusion-making separation impossible, as alternatives to hemisection. Hemisection of molars with questionable prognosis can maintain the teeth without detectable bone loss for a long-term period, provided that the patient has optimal oral hygiene<sup>(9)</sup>. Mandibular molar

can be resected if the decay is restricted to one root and the other root is healthy and the remaining portion of the tooth can very well act as an abutment.<sup>(10)</sup> This clinical report illustrates one of the solutions to the endo-perio problem by hemisection and fixed partial dentures. Mandibular first molar usually have a more favourable prognosis since they have more divergent roots than the second molar and also the furcation is usually located at a more apical position on the root in relation to crown of the tooth.

### || Conclusion

Hemisection is an alternative, effective, and conservative treatment modality over conventional procedures or extraction of periodontally and endodontic affected teeth. So, to conclude, an interdisciplinary treatment planning of root resection is a key to success.

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