

Hope for the Hopeless Tooth: A Case Report

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ABSTRACT

Aim: To report root amputation as a treatment option for periodontally involved mandibular molars.

Case description- Hemisection in endodontics refers to the sectioning of a molar tooth with the removal of an unrestorable root which may be affected by periodontal, endodontic, structural defects or caries. This case study presents one treatment option available in cases of extensive decay in molars or molars affected by extensive periodontal lesions that endanger the loss of the tooth. Hemisection of the affected tooth allows the preservation of tooth structure, alveolar bone and cost savings over other treatment options. Thus, hemisection may be considered as a suitable alternative to extraction and implant therapy especially for advanced endoperio cases and should be discussed with patients during consideration of treatment options.

Keywords: Hemisection, root resection, mandibular molar

also express a desire to save their natural dentition in favor of extraction whenever possible. Understanding the choices and their impact on future dental health and lifestyle is a very important step in decision making. Management of the periodontally involved tooth with grossly carious defects is a challenging task for a dentist. Hemisection is one of alternative conservative treatments which aims to preserve the remaining healthy tooth structure and prevent numerous undesirable sequelae including alveolar bone loss, tooth drifting, vertical dimension collapse, supra-eruption of opposing teeth and a decrease in chewing efficiency that usually occurs after extraction of the posterior tooth. Hemi-section refers to surgical separation or removal of compromised root and its accompanying coronal portion through furcation area of multirooted tooth especially in mandibular molars.^{1,2} The indications and contraindications for tooth resection are listed in Table 1 and 2.³

Table 1: Indications of hemisection

	Periodontal indications	Endodontic and restorative indications
1	Severe vertical bone loss involving only one root of multi-rooted teeth	Prosthetic failure of abutments within a splint:
2	Through and through furcation destruction	Endodontic failure
3	Unfavorable proximity of roots of adjacent teeth, preventing adequate hygiene maintenance in proximal areas	Vertical fracture of one root
4	Severe root exposure due to dehiscence	Severe destructive process.

INTRODUCTION

Preservation of the natural dentition is a primary goal of dentistry. Patients today not only value their teeth but



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Table 2: Contraindications of hemisection

Contraindications	
1	Poorly shaped roots and fused roots.
2	Poor endodontic candidates or inoperable endodontic roots.
3	Patient unwilling to undergo surgical and endodontic treatments.

CASE REPORT 1

A 27- year old male patient reported to the Department of Conservative Dentistry and Endodontic, with the chief complaint of pain and food lodgment in lower right posterior teeth since past one month. Patient had a past dental history of root canal treatment of right mandibular first and second molars (46 and 47), nineteen months ago. However; patient did not give any significant medical history. On intra-oral examination, a large carious lesion was discovered in the distal surface of 46 extending subgingivally with fractured post endodontic amalgam restoration.

Radiographic examination [Fig. 1(a)] revealed severe vertical bone loss surrounding the distal root of 46 with



Figure 1(a) Preoperative view of case report 1 showing grossly decayed distal root of 46.

deep carious lesion extending up to the furcation area; however mesial root presented with a good obturation and with a sound periodontal support, tooth 47 was under obturation. Treatment option was extraction of the involved tooth followed by fixed partial denture, removable partial denture. As the patient was not willing for extraction, so it was decided to resect the damaged distal root and other treatment options i.e. root resection and hemisection, were explained with

all the risks and benefits to the patient. The patient agreed to this treatment option and consent was taken. On the following appointment root canal re-treatment was done in 47 with lateral condensation method and post obturation restoration was done with a posterior composite resin (P60, 3M, ESPE) [Fig. 1(b)].



Figure 1(b):Retreatment of 46, 47.

The patient was scheduled for hemisection [Fig. 1(c)]



Figure 1(c): Resection of distal root of 46.

on the next appointment. After administration of local anaesthesia, horizontal sulcular incision was given to raise the envelope flap to gain the surgical access to the distal root of 46. Vertical cut extending from the crown to the bifurcation area was made and distal portion of the tooth involving both crown and the root portion was resected. The socket was then irrigated adequately with sterile saline followed by trimming of any sharp surfaces in the furcation area to prevent further periodontal irritation. The flap was repositioned and sutured with 3/0 black silk sutures. Surgical area was allowed to heal by minimizing the

forces on the root for 6 weeks. After healing of the tissues, fixed bridge involving retained mesial half of mandibular first molar and mandibular second molar with sanitary pontic was given [Fig 1(d) and 1(e)].



Figure 1(d): Crown preparation of 46 and 47.



Figure 1(e): Tooth with porcelain fused to metal crown.

Patient was recalled at 1, 3, 6 and 12 months. The success of the treatment was observed on the radiograph by the absence of the periodontal ligament widening and bone formation at an extraction site [Fig. 1(f)]



Figure 1(f) Twelve month follow up of 46, 47.

CASE REPORT 2

A 32 year old systemically healthy female reported to the Department of Conservative Dentistry and Endodontics, with a chief complaint of pain and food lodgment in the lower left back region since 20 days. Pain was mild and intermittent in nature but it aggravated on mastication. Patient had a dental history of root canal treatment in mandibular second molar (37), two years ago. Intra-oral examination revealed a large carious lesion in relation to 36 and 35. Probing revealed a deep periodontal pocket on the distal surface of first molar. Radiographic examination [Fig. 2(a)]



Figure 2(a): Preoperative view of case report 2 showing grossly decayed lesion in distal part of 36.

showed severe vertical bone loss surrounding the distal root with resorption of root and involving the furcation area; however mesial root had adequate with sound periodontal support. Hemisection of distal root of 36 was decided after the completion of endodontic treatment for the mesial root of 36 and mandibular second premolar. Post endodontic restoration was done with composite resin (P60, 3M, ESPE). The option of root resection and hemi section was explained with all the risks and benefits to the patient. The patient



Figure 2(b): Endodontic treatment of 35, 36, 37 and root resection of 36

agreed to this treatment option and consent was taken. Hemisection of distal root of mandibular first molar was done following the same technique discussed in Case 1 [Fig. 2(b)].

Tooth preparation of the distal portion of first permanent molar, second molar and second premolar was done followed by porcelain fused to metal crown [Fig. 2(c) and 2(d)].



Figure 2(c): Crown preparation in 35, 36 and 37



Figure 2(d): Radiograph showing porcelain fused to metal crown in 35, 36 and 37

DISCUSSION

The present clinical report demonstrates a conservative treatment to the endo-perio problem by hemisection followed by prosthetic rehabilitation. Hemisection demonstrates an alternative treatment to an extraction of a whole tooth and salvation of remaining healthy tooth structure in a case otherwise indicated for extraction. If performed carefully with standard procedures,

it not only satisfies the patient psychologically by minimizing the negative implications of tooth loss, but also preserves the proprioception which is utmost for normal functioning of the stomatognathic system and hence avoiding any damage to the temporomandibular joint.

The prognosis for hemisection is the same as for routine endodontic procedures provided that case selection has been performed correctly and the restoration is of an acceptable design relative to the occlusal and periodontal needs of the patient as it was done in this case. Careful case selection and treatment decision are influenced by many factors including clinician's expertise, tooth factors, strategic importance of the tooth, bone quality, soft tissue quality and quantity, accessibility to the area of operation, periodontal status around the remaining root and, of course, the patients medical history. However, hemisection may affect long-term prognosis of the tooth if there are improper restorative margins or if occlusal surfaces are not reshaped properly to have a harmonious contact relationship between maxillary and mandibular teeth. The rough and sharp areas in furcation region should be smoothed properly to prevent any gingival irritation and hence plaque deposition. Occlusal modification of the remaining tooth need to be done to modify the forces on the remaining root which otherwise may get fracture.⁴ Recently, Park *et al.* have suggested that if proper oral hygiene is maintained by the patient hemisection of a tooth can be considered as an alternative treatment to save the tooth which is otherwise indicated for extraction.⁵ Likewise, Saad *et al.* have also concluded that hemisection of a mandibular molar as a conservative treatment for extraction if one of the two roots is grossly damaged and remaining tooth can serve as a healthy abutment.⁶

CONCLUSION

Treatment decision should consider a risk to benefit ratio for every case selection. Ultimately, priority is to save the natural teeth and whenever indicated, the clinician should consider hemisection as an alternative conservative treatment option to extraction, especially for teeth with advanced endo-perio lesions.

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