

Restoring Ailing Multirouted Abutment Through Hemisection : A Case Report

Abhinav Gupta¹, Gaurav Singh², Geeta Rajput³

^{1,2}Assistant Professor, ³Professor and Head
Dr. Z.A. Dental College, Aligarh, India

ABSTRACT

Hemisection denotes removal or separation of root with its accompanying crown portion of mandibular molars. It is an useful alternative procedure to save those multi-rooted teeth which have been indicated for extraction. This procedure represents a form of conservative dentistry, aiming to retain as much of the original tooth structure as possible. The results are predictable with high success rates when cases are properly selected. This article describes a simple procedure for hemisection of a root canal treated abutment mandibular molar, with endodontic failure and its subsequent restoration with a fixed partial denture.

Keywords: abutment , hemisection, mandibular molar

INTRODUCTION

Modern advances in all phases of dentistry have provided the opportunity for patients to maintain a functional dentition for lifetime. The treatment may involve combining restorative dentistry, endodontics and periodontics so that the teeth are retained in whole or in part. An abutment molar with extensive decay may be unsuitable for restoration. Restoration and preservation of such teeth if possible, can be useful as independent units of mastication or as one of the abutments in simple fixed bridges. They can also be useful for preserving bone volume for future dental implant placement if required as a part of treatment plan.¹ Tooth resection procedures are used to preserve as much tooth structure as possible rather than sacrificing the whole tooth.²

The term tooth resection denotes the excision and removal of any segment of the tooth or a root with or without its accompanying crown portion. Various resection procedures described are: root amputation, hemisection, radisection and bisection. Hemisection (removal of one root) involves removing significantly compromised

root structure and the associated coronal structure through deliberate excision.³ Weine⁴ 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 multirouted 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.

Correspondence: *Dr. Abhinav Gupta; e-mail: abhiprakash2@yahoo.co.in*

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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 sub.gingival caries, traumatic injury, and large root perforation during endodontic therapy.

5. The surviving root is structurally capable of supporting a dowel and core restoration.

6. The surviving root is aligned so as to provide proper draw for the resulting fixed prosthetic restoration.

7. The root morphology allows for surgical access and proper periodontal maintenance of the final restoration.⁵

Contra Indications

- Strong adjacent teeth available for bridge abutments as alternatives to hemisection.
- Inoperable canals in root to be retained.
- Root fusion-making separation impossible.

CASE REPORTS

A female patient aged 35 years was referred to the department of prosthodontics for the replacement of teeth. The clinical examination revealed root canal treated lower second molar with a sinus tract present mesially on the crest of extracted lower first molar alveolar ridge. On probing the area, there was a 11 mm deep infrabony periodontal pocket around the mesial root of the lower second molar tooth. (Fig.1) Radiographic examination revealed a broken instrument in the mesial root of lower second molar.(Fig.2) However, adequate bone support was present along the root canal treated distal root. Under local anaesthesia, full thickness flap was reflected after giving a crevicular incision from second premolar to second molar. Upon reflection of the flap, the crater like bony defect along the mesial root became quite evident. All granulation tissue was removed with Gracey curettes to expose the bone. The vertical cut method was used to resect the crown with mesial root. A long shank tapered fissure carbide bur was used to make vertical cut toward the bifurcation area.(Fig.3) A fine probe was passed through the cut to ensure separation. The mesial

half was extracted and the socket was irrigated adequately with sterile saline. (Fig.4) Scaling and root planning of the root surfaces, which became accessible on removal of mesial root was done. The extraction site was irrigated and debrided. The crater like bony defect was grafted with Platelet rich fibrin (PRF) prepared by Choukrons⁶ method. Then the flap was repositioned and sutured with 3/0 black silk sutures. The occlusal table was minimized to redirect the forces along the long axis of the distal root. After 3 months healing of the tissues (Fig. 5), fixed bridge involving retained distal half and mandibular third molar with sanitary pontic was given. (Fig. 6)



Fig 1

Fig 2



Fig 3

Fig 4



Fig 5

Fig 6

DISCUSSION

Root amputation / hemisection is a useful alternative procedure to save those multi-rooted teeth which have been indicated for extraction. Recently, Park et al⁷ have suggested 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. Saad et al⁸ have also concluded that hemisection of a mandibular molar is a suitable treatment option when the

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decay is restricted to one root and the other root is healthy and remaining portion of tooth can very well act as abutment. For this patient, hemisection was selected for treatment of inoperable mesial root in the pier abutment of a fixed prosthesis. Implant therapy was considered but not chosen; instead, a 4-unit fixed partial denture, extending from the mandibular third molar involving hemisected second molar to the second premolar, was completed. The literature on distal root resection is limited; more often, this root is retained and the mesial root removed. However, the distal root is broader and straighter, making it more suitable as an abutment.⁹ The mesial root contains a longitudinal groove, which decreases its surface area and contraindicates the use of posts. Hemisection allows for physiologic tooth mobility of the remaining root, which is thus a more suitable abutment for fixed partial dentures than an osseointegrated counterpart.⁹ The smaller size of the occlusal tables, under-contouring of the embrasure spaces and ensuring that the crown margin encompasses the furcation are all factors in the high success rates observed with hemisection therapy.¹¹

Clinically hidden roots/lips and ledges in mandibular molars were readily observed in radiographs, Since subgingival defects are believed to encourage future periodontal disease, it is important that the dentist detect these structures and correct them before proceeding with the permanent restoration.

To summarize, It is important to consider the following factors before deciding to undertake any of the resection procedures.⁹

- Advanced bone loss around one root with acceptable level of bone around the remaining roots.
- Angulation and position of the tooth in the arch. A molar that is buccally, lingually, mesially or distally tilted cannot be resected.
- Divergence of the roots - teeth with divergent roots are easier to resect. Closely approximated or fused roots are poor candidates.

CONCLUSION

Hemisection is an useful alternative procedure to save those multi-rooted teeth which have been indicated for extraction .With recent refinements in endodontics, periodontics and restorative dentistry, hemisection has received acceptance as a conservative and dependable dental treatment and teeth so treated have endured the demands of function.

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