

Hemisection: A Window of Hope for the Hopeless Tooth

Anjusha Sharda^{1*} Sanjay Gupta² Zeba Zareen³ Rahul Jeswani⁴

¹PG Student, Department of Periodontology, Career Post-Graduate Institute of Dental Science and Hospital, Lucknow, U.P, India.

²Professor and Head, Department of Periodontology, Career Post-Graduate Institute of Dental Science and Hospital, Lucknow, U.P, India.

³PG Student, Department of Periodontology, Career Post-Graduate Institute of Dental Science and Hospital, Lucknow, U.P, India.

⁴Consultant Orthodontist, Gwalior, Madhya Pradesh, India.

ABSTRACT

Background: Hemisection is to remove the compromised root and the associated crown portion with the loss of periodontal attachment. It is performed to maintain the original tooth structure and attain the fixed prosthesis. This case report describes a simple procedure of hemisection in a mandibular molar. It was a conservative approach aiming to retain as much original tooth structure as possible against the option of extraction of the natural tooth. Hemisection of the affected tooth allows the preservation of tooth structure, alveolar bone and cost savings (time and money) over other treatment options. The preservation of posterior abutment teeth permits oral rehabilitation with fixed bridges instead of removable prosthesis. Preservation of a hopeless tooth is possible with patients having good oral hygiene, and careful surgical and restorative management.

Keywords: Hemisection, resection, furcation involvement, Fixed partial denture.

INTRODUCTION

Advances in all the phases of dentistry made it possible for patients to maintain a functional dentition for lifetime. Continued periodontal breakdown leads to total loss of tooth unless these defects are repaired or eliminated and health of the tissues is restored. Thus tooth resection procedures are used to preserve tooth structure as much as possible rather than sacrificing the whole tooth.¹ The term tooth resection is the excision and removal of any segment of the tooth or a root with or without its accompanying crown portion. Various procedures of resection described are as : root amputation, hemisection, radisection and bisection. Root amputation is described as the removal of one or more roots of multirrooted tooth while other roots are retained. Whereas, hemisection denotes the removal or separation of root with its accompanying crown portion of the mandibular molars.² The retained root is endodontically treated and the furcation area is

made self-cleansable. The success rate of these types of endo-perio furcation lesions are most likely related to the anatomical characteristics of furcation area interfering with adequate instrumentation.³ Indications for root resection listed by *Weine F*² are as follows :

1) Periodontal indications : When there is severe vertical bone loss involving only one root of multirrooted teeth; Through and through furcation destruction; Unfavorable proximity of roots of adjacent teeth, which prevents adequate hygiene maintenance in proximal areas; Severe root exposure due to dehiscence.

2) Endodontic and restorative indications: When there is prosthetic failure of abutments within a splint: If a single or multirrooted tooth is periodontally involved within a fixed bridge and the abutment support is sufficient, the root of the involved tooth is extracted; Endodontic failure: Hemisection is useful when there is

Received: Sept. 12, 2020: Accepted: Oct. 23, 2020

*Correspondence Dr. Anjusha Sharda.

Department of Periodontology, Career Post-Graduate Institute of Dental Science and Hospital, Lucknow, U.P, India.

Email: Not Disclosed



Fig 1: Radiograph showing vertical bone loss around.



Fig 2: Obturation irt 46.



Fig 3: Full thickness flap reflected.



Fig 4: Carbide bur making the vertical cut.



Fig 5: Hemisection of tooth done.



Fig 6: Hemisected tooth portion.



Fig 7: Suture placed.



Fig 8: Post operative view after 10 days.

perforation through the pulp chamber, or pulp canal of one of the roots of an endodontically involved tooth cannot be instrumented; Vertical fracture of one root: If vertical fracture traverses one root while the other roots are unaffected, the offending root may be amputated; Severe destructive process: This may occur as a result of furcation or subgingival caries, traumatic injury, and large root perforation during endodontic therapy.

Whereas, the contraindications for root resection are: Poorly shaped roots or fused roots; Poor endodontic candidates or inoperable endodontic roots; Patient unwilling to undergo surgical and endodontic treatment.

CASE REPORT

A 46 year old female patient, reported in the Dept of Periodontology, Career Institute of Dental Science and Hospital, Lucknow, Uttar Pradesh, India with the chief complaint of pain and sensitivity in right lower posterior region, since 3 months. The patient did not gave any significant medical history. On intraoral examination, the tooth showed grade I mobility and was sensitive to percussion. Radiographic examination revealed severe vertical bone loss surrounding the distal root with resorption of root and involving the furcation area (fig 1). A conservative treatment was selected, which included hemisection of the distal root of 46. So, it was decided that the distal root should be hemisected after completion of endodontic therapy of the tooth. The whole procedure was explained to the patient and a thorough scaling and root planing was done. Working length was determined. Biomechanical preparation was done. The canals were obturated (fig 2). Under local anesthesia, full thickness flap was reflected.

inflammatory tissues. The vertical cut method was used to resect the crown with distal root. A long shank, tapered fissure carbide bur was used to make a vertical cut toward the bifurcation area. The distal half was extracted and the socket was irrigated adequately with sterile saline. The flap was repositioned and sutured with 3-0 silk non-resorbable interrupted sutures (fig.3-7). The patient was prescribed Amoxicillin 500mg 8 hourly for 5 days, also

Diclofenac 50mg was prescribed 8 hourly for 5 days. The patient was instructed to rinse with 0.2% Chlorhexidine rinses twice a day for 2 weeks. The sutures were removed 10 days later (fig 8). The patient was monitored on a weekly schedule, postoperatively, to ensure good oral hygiene in the surgerized area.

DISCUSSION

The nonsurgical debridement of root canals, as well as surgical approaches is required to provide better access to clean the root surfaces and apical lesions for the management of perio – endo defect.⁴ Hemisection is a useful alternative procedure to save those multirooted teeth which have been indicated for extraction. Before selecting a tooth for hemisection, patient's oral hygiene status, caries index, and medical status should be considered. The hemisection of multirooted teeth, includes the root canal treatment of the remaining roots and restoring them with suitable restorative material.⁵ In our case, there was good bone support on the mesial side of 46. The roots were not closely approximated or fused. Hemisection as a treatment option was suited to the case. Appropriate endodontic therapy must be performed before hemisection to avoid intrapulpal dystrophic calcification and postoperative tooth sensitivity.⁶ In this particular case, the hemisected tooth will be observed for 6 months for bone support and a fixed prosthesis involving 45,46 will be given only after that. Thus, the hemisection can be considered as an effective and conservative treatment against extraction of the tooth with extensive caries.

CONCLUSION

With recent refinements in dentistry, hemisection has received acceptance as a conservative dental treatment for a hopeless tooth. This case presents a technique to maintain tooth structure in a compromised tooth. The keys to long term success appear to be thorough diagnosis, selection of patients with good oral hygiene, careful surgical and restorative management. It was shown that such teeth can function successfully for long periods.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

REFERENCES

1. Basaraba N. Root amputation and tooth hemisection. Dent Clin North Am 1969 ; 13 : 121 - 32.
2. Weine F S. Endodontic Therapy, 5th Edition
3. Newell D H. The role of the prosthodontist in restoring rootresected molars: A study of 70 molar root resections. J Prosthet Dent 1991 ; 65 : 7-15.
4. Verma P K, Srivastava R, Gupta K K, Srivastava A. Combined endodontic-periodontal lesion: A clinical dilemma. J Interdiscip Dentistry 2011 ; 1 : 119-24.
5. Saad M N, Moreno J, Crawford C. Hemisection as an alternative treatment for decayed multirooted terminal abutment: A case report. J Can Dent Assoc 2009; 75 : 387-90.
6. Vivekanada Pai A R, Khosla M. Root resection under the surgical field employed for extraction of impacted tooth and management of external resorption. J Conserv Dent 2012 ; 15:298 - 302.