

Hemisection - Divide & Rule: A Case Report

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ABSTRACT: *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 removed. In order to carry out this present day mandate, periodontally diseased teeth with severe bone loss or those that are grossly carious may be well retained by removal of one or more of their roots. This case report describes a simple procedure for hemisection in mandibular molar with fractured and periodontically compromised mesial root.*

KEYWORDS: Hemisection, Dentistry, Molar, Periodontal, Fracture.

INTRODUCTION

A molar with extensive decay, periodontal problem or a root fracture may be unsuitable for restoration. In such cases, the treatment options are limited and may include extraction of the involved tooth followed by placement of partial denture or a dental implant to replace the missing tooth. Alternatively, under specific conditions only the diseased part of the tooth can be extracted (Hemisection). Hemisection involves removing significantly compromised root structure and the associated coronal structure through deliberate excision.¹ This procedure represents a form of conservative dentistry, aiming to retain as much of the original tooth structure as possible.² The results are predictable and success rates are high.³ Care must be taken to carefully smoothen the furcation area so as to allow proper cleansing and to prevent plaque accumulation, as root fracture is the main cause of failure after hemisection, so occlusal modifications are required to balance the occlusal forces on the remaining root.⁴ Indication for hemisection can be endodontic and periodontal.

Weine⁵ has listed the following indications for tooth resection.

PERIODONTAL INDICATION

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 multirooted 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.
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 subgingival caries, traumatic injury, and large root perforation during endodontic therapy.

CONTRAINDICATIONS

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

CASE REPORT

A 46 year old female patient reported to the Department of Conservative Dentistry and Endodontics at Institute of Dental Sciences, Bareilly (U.P). complaining of pain in right lower back tooth region since 1 week. Pain was dull aching and intermittent in nature, which aggravated on mastication. On examination fracture of mesial root was seen in respect to 46 (fig 1) tooth was tender on percussion and pocket was present around the mesial root. History revealed that a year ago, she got root canal treatment done in

the same tooth followed by an extra coronal restoration. Her medical history was non contributory. On radiographic examination, fracture on mesial root was evident; bone support of the distal root was completely intact. It was decided to partially preserve the tooth by removing the mesial root. On first visit the tooth was restored with composite to maintain good seal and allow interproximal area to be properly countered during surgical separation (fig 2). On second visit local anaesthesia was administered and flap was raised using vertical cut method to resect the crown (fig 3). A long shank tapered fissure carbide bur was used to make a vertical cut towards the bifurcation area. A fine probe was passed through the cut to ensure the separation. Radiographs were taken to prevent unnecessary tooth loss during cutting. The mesial root was extracted (fig 4) and confirmed radiographically. The extraction site was irrigated and debrided. Flap was then repositioned and sutured with 3-0 black silk suture (fig 5). The occlusal table was minimised to redirect the forces along the long axis of the distal root.

DISCUSSION

Root amputation/hemisection is a useful alternative procedure to save those multi-rooted teeth which have been indicated for extraction. Also, accessibility of root furcation for easy separation as well as good bone support for the remaining root should be assessed.⁶ Recently, Park et al. have suggested that 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.⁷ Saad et al. have also concluded that hemisection of a mandibular molar may be a suitable treatment option when the decay is restricted to one root and the other root is healthy and remaining portion of tooth can very well act as an abutment.⁸ Buhler stated that hemisection should be considered before every molar extraction⁹, because it provides a good, absolute and biological cost saving alternative with good long term success. A guiding principle should be to try and maintain what is present.¹⁰ The use of hemisection to retain a compromised tooth offers a prognosis comparable to any other tooth with endodontic treatment. Hence Periodontal, Prosthodontic and Endodontic assessment for appropriate selection of cases is important. To summarize, it is important to consider the following factors before deciding to undertake any of the resection procedures¹¹

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. A molar which is buccally, lingually, mesially or distally tilted cannot be resected.
3. Divergence of roots: teeth with divergent roots are easier to resect. Closely approximated or fused roots are poor candidates.
4. Length and curvature of roots: long and straight roots are more favourable for resection than short conical roots.

5. Feasibility of Endodontic and Restorative Dentistry in the roots/roots to be retained.

CONCLUSION

Hemisection should be considered as a another weapon in the arsenal of the dental surgeon, determined to retain and not remove the natural teeth. With recent refinements in Endodontics 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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LIST OF PHOTOGRAPHS



Fig 1: Pre Operative IOPA Radiograph



Fig 2: Complete Restrotration Done with Posterior Composite



Fig 3: Flap Raised Showing a Vertical Fracture in Mesial Root



Fig 4: Mesial Root Extracted



Fig 5: Suturing Done

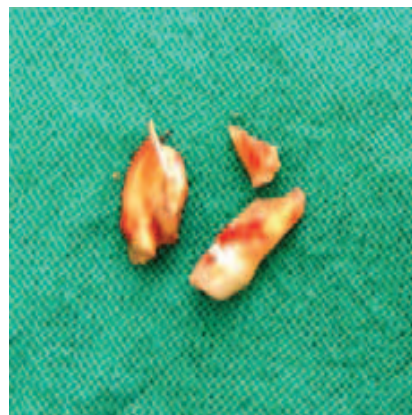


Fig 6: Extracted Segments