

**MANAGEMENT OF FURCATION INVOLVED TEETH- A CASE REPORT!**

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**ABSTRACT**

Recent advances in the treatment options for periodontally involved teeth have enabled patients to maintain a functional dentition for a longer period of time. Natural teeth are often preferred by patients over the pricey prosthetic treatment of dental implants or bridges. A variety of treatment modalities for saving or replacing the teeth are available which should be clearly explained to the patient. Furcation involvement refers to the pathologic resorption of bone within the furcation, the treatment of which is often challenging. Hemisection is a reliable procedure to save a furcally involved tooth without extraction. If performed correctly in indicated cases, this procedure has shown to have a good prognosis.

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**INTRODUCTION**

Periodontal disease is a chronic inflammatory disease which is characterized by destruction of the tooth supporting structures.<sup>1</sup> Bacterial plaque is the primary etiologic factor for the initiation of this disease. However, it is a complex disease with multifactorial etiology.<sup>2</sup> Molars are the teeth with maximum frequency of tooth loss due to untreated periodontal disease.<sup>3</sup> Attachment loss and bone resorption within the furcation is one of the grimmest anatomical consequences of periodontal disease. Management of furcally involved teeth is difficult due to the complex and irregular anatomy of the molars and inability to access the furcation for instrumentation due to the small entrance. Resective therapy has been utilized for the treatment of furcation involvement for many years. Not all cases of furcation involvement can be treated with regenerative procedures such as bone graft and Guided tissue regeneration (GTR).<sup>4</sup> Therefore, resective therapy is an important therapeutic procedure for management of furcation involvement.

**Hemisection**

Hemisection is defined as the removal of half of a tooth performed by sectioning the tooth and removing one root. The term is frequently used with reference to lower molars.<sup>5</sup>

**Indications for resective therapy<sup>1</sup>**

**Periodontal indications**

- Severe bone loss affecting one or more tooth untreatable with regenerative procedures

- Class II or class III furcation invasions or involvements
- Severe recession or dehiscence of a root

**Endodontic indications**

- Inability to successfully treat or fill a canal
- Root fracture or root perforation
- Severe root resorption
- Root decay

**Prosthetic indications**

- Severe root proximity inadequate for a proper embrasure space
- Root trunk fracture or decay with invasion of the biological width

**Contraindications for resective therapy<sup>1</sup>**

**General contraindications to periodontal surgery**

- Systemic factors
- Poor oral hygiene

**Factors associated with local anatomy**

- Fused roots
- Unfavorable tissue architecture

**Endodontic factors**

- Retained roots endodontically untreatable
- Excessive endodontic instrumentation of retained roots
- Excessive deepening of pulp chamber floor

**Restorative factors**

- Internal root decay
- Presence of a cemented post in the remaining root

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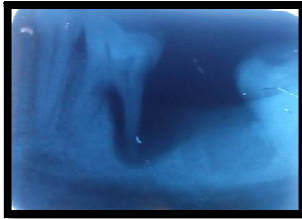
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**Strategic considerations**

- Consider adjacent teeth available for conventional prosthetic restoration
- Consider removable prosthesis
- Consider implants

**Case Report**

A 35 year old female patient, reported to the Department of Periodontology, with the chief complaint of pain in the lower left back region of the jaw. Pain was dull aching and intermittent in nature that aggravated on mastication. No extraoral swelling was observed. Patient had not taken any medication or treatment related to that tooth. Patient was systemically healthy and a non-smoker.



Pre-operative view



3 months after Intentional RCT



Incision for Hemisection



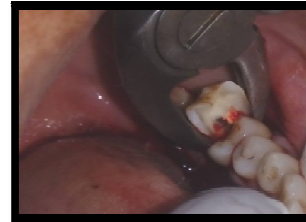
Marking for Hemisection after flap reflection

Intraoral examination revealed missing mandibular second molar, fairly good oral hygiene and a probing pocket depth of 10 mm on the distal aspect of first mandibular molar along with grade III furcation involvement. There was no recession

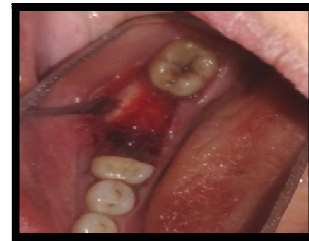
with 36. The first mandibular molar exhibited Grade I mobility and positive tenderness to percussion.



Hemisection done with a carbide bur



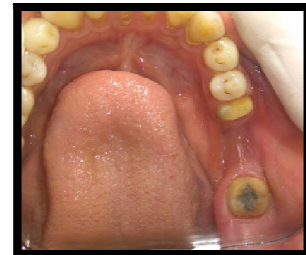
Extraction of distal portion of the tooth



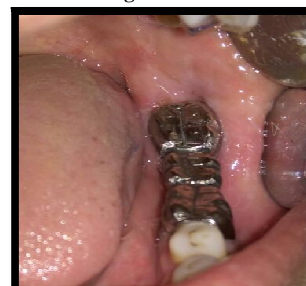
After extraction



Sutures given



Healing after 3 months



Prosthesis given after 3 months

The intraoral periapical radiograph showed extensive bone loss along the distal root of the tooth as compared to mesial root, Grade III furcation involvement and periapical rarefaction with the distal root. The periodontal support with the mesial root was sufficient and the vitality test was positive. The treatment options were explained to the patient which included extraction with left first mandibular molar followed by implant placement, fixed partial denture and removable partial denture. Patient was not willing for implant placement therefore a more conservative treatment option of hemisection was planned.

### Endodontic Phase

Intentional root canal treatment was completed with 36 in a conventional manner. After 3 months of RCT, hemisection was carried out.

### Hemisection procedure

After proper administration of anaesthesia, crevicular incision was given from lower left first premolar to second molar region. Followed by incision, a full thickness mucoperiosteal flap was reflected for adequate accessibility for instrumentation. The osseous defect was observed distal to 36 with extensive bone loss around distal root. Debridement of the granulation tissue with proper scaling and root planing was carried out with 36. A marking was made vertically up to the bifurcation area on the tooth as a guideline for hemisection procedure. A tapered fissure carbide bur was used to make the cut through the tooth extending faciolingually. The distal root was then extracted. Thorough root planing of the mesial root and debridement and irrigation with the socket of the distal root was carried out. The socket was grafted with DFDBA bone graft for preservation. Odontoplasty was performed and the mesial portion of the tooth was contoured to make all the surfaces smooth so as not to allow plaque retention and facilitate oral hygiene measures. The surgical site was then closed with approximation of buccal and lingual flaps with sutures.

Patient was recalled after 1 week for removal of sutures and after 3 months for reevaluation with the hemisected tooth. Radiograph showed bone regeneration in the distal socket of 36 and sufficient periodontal support with the mesial root. Therefore, it was planned to restore the hemisected tooth with fixed partial denture with 38 and mesial root of 36.

After cementation of the FPD, oral hygiene instructions were given to the patient and patient was put on a periodic recall visit.

## DISCUSSION

The prevalence of periodontitis in India has been reported to be ranging from 34.8% to 85.62%.<sup>6,7</sup> Molars have been reported to be the tooth with utmost risk of tooth loss in untreated periodontitis, that could be to some extent explained by the presence of furcations. Studies on dry skulls have reported the prevalence rate of furcation involvement in mandibular molars to be 85.4%.<sup>8</sup> Longitudinal long term clinical surveys have shown periodontal therapy to be effectual in halting the disease process in almost every patient.<sup>9-11</sup>

In this case, hemisection was planned as the patient was not willing for extraction of the tooth and implant placement and

also there was sufficient bone support around the mesial root of the molar. Hence, the distal root was extracted. More often distal root is the root which is retained due to the larger surface area of the root which makes it more suitable as an abutment. Mesial root has a longitudinal groove which decreases the surface area. In this case, distal root was resected due to the amount of bone loss which was present surrounding that root. Implant therapy would have required placement of two implants to replace the missing second molar and the first molar, which would have required ridge augmentation prior to implant placement.

Studies have shown that if root planing is performed on molars by a closed approach or an open flap approach, some amount of calculus still remains on the tooth surfaces, the percentage of which increases with an increase in pocket depth.<sup>12</sup> Therefore, resective therapies have been suggested to overcome the difficulties encountered in non-surgical therapy of molars. Hemisection is a surgical separation of the roots in a multi rooted tooth, especially a mandibular molar, through the furcation area in such a way that a root or roots maybe surgically removed with the associated part of the crown {1986 Glossary of Periodontic Terms}.

Long term studies (3 to 11.5 years) examining resective therapy in treatment of furcation involved teeth have shown a quite low failure rate (0 to 38%).<sup>1</sup> Most frequently failures seemed to be due to endodontic or restorative reasons. Plaque control has been reported to be equal and even better in treated teeth than in non furcated areas. A meta-analysis has shown that over a 7 year observation period, the failure rate of teeth treated with root separation and resection was 11%.<sup>13</sup>

Resective therapies are often compared with regenerative procedures for the treatment of furcation defects. Regenerative therapy that includes bone graft and guided tissue regeneration (GTR) aims at reconstruction of lost periodontium. However, resective therapy aims at removing the remaining structure of the tooth that defines the shape of the furcation defect. GTR procedure is preferred in mandibular molars if it is a Class II type of furcation involvement due to better success.<sup>14</sup>

A careful multidisciplinary approach is required for successful treatment of resected teeth that involves periodontal, endodontic and prosthetic approaches. For these reasons, the efficiency of respective therapies remains controversial and the complications seem to be non-periodontal in nature.

## CONCLUSION

The periodontal literature regarding which approach for management of furcation lesions provides better long term prognosis is lacking. Resective therapy for dealing with furcation defects, however, is an imperative component of the periodontist's armamentarium. It serves as a viable substitute to extraction of teeth and thus provides a functional dentition to the patients. Complications of resective procedures such as fracture of resected teeth are uncommon but are avoidable if proper guidelines are followed.

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