

Salvaging a Young Lower Molar with Furcal Radiolucency by a Novel and Innovative Endodontic Procedure- A Case Report.

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ABSTRACT

The treatment, management and long-term retention of mandibular molar teeth involving furcation, have been a challenge to the dental specialist. This is especially true when the furcation involvement has progressed to a Class III furcation. Successful management of such teeth requires a multidisciplinary approach involving endodontic, restorative and prosthetic interventions, especially in multi-rooted teeth. 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. Hemisection involves sectioning of a periodontally involved mandibular molar so as to remove the involved root and preserving the remaining tooth structure, alveolar bone and cost savings (time and money) over other treatment options. This article describes a simple procedure for hemisection in mandibular molar and its subsequent restoration.

Keywords: Hemisection, Fracture, Furcation, Molar, Periodontal.

INTRODUCTION

A molar with extensive decay may be unsuitable for restoration. In such cases, the treatment options are limited and may include a removable partial denture or a dental implant to replace the missing tooth.^[1] Alternatively, if the decay is limited to one root, a hemisection procedure may be carried out. It is a conservative approach that aims to retain as much of the original tooth structure as possible.^[2] To allow proper cleaning and to prevent plaque accumulation, furcation area must be properly smoothed. Occlusal modifications are required to balance the occlusal forces on the remaining root, as the root fracture is the main cause of failure after hemisection.^[3]

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This case study presents one treatment option available in cases of extensive decay in molars or molars affected by extensive periodontal lesions that threaten the loss of the 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 term hemisection refers to the sectioning of a molar tooth with the removal of an unrestorable root which may be affected by periodontal, endodontic, structural (cracked roots). Careful case selection determines the long-term success of the procedure.^[4] Indication for hemisection can be endodontic or periodontal. Weine^[5] 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. The 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.
2. Endodontic failure/ perforation through the floor of the pulp chamber.
3. Vertical fracture of one root.
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. Poorly shaped roots or fused roots.
2. Poor endodontic candidates or inoperable endodontic roots.
3. Patient unwilling to undergo surgical and endodontic treatments and undertake the care or the resulting restoration.

CASE REPORT

A 38-year-old female patient, reported to the Department of Conservative Dentistry and Endodontics in Himachal Dental College Sundernagar, with a chief complaint of pain in lower left back tooth region. The pain was dull aching and intermittent in nature and aggravated on mastication. The patient did not give any significant medical history and past dental history. Extraoral examination revealed no abnormality. On intraoral examination, it was found that a patient had good oral hygiene. On probing, a periodontal pocket of 6–8mm was found on the buccal and distal surfaces of left lower mandibular first molar along with grade III furcation involvement [Figure 1].



Figure 1: Preoperative Clinical View with Probing.

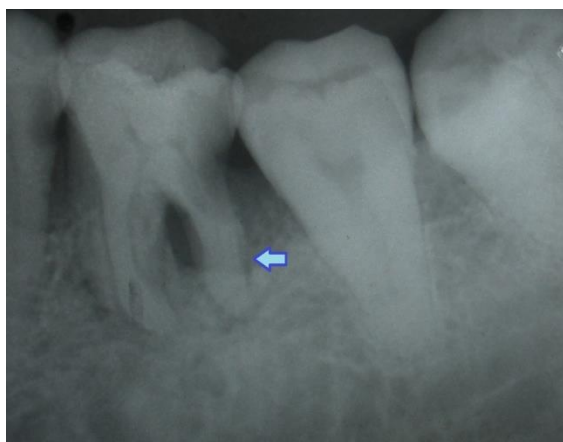


Figure 2: Preoperative radiographic view.

On percussion, Grade II mobility was found and the tooth was sensitive to percussion. On radiographic

examination, IOPA showed grade III furcation defect with periodontal bone loss more along the distal root as compared with mesial root and periapical rarefaction was seen with both the roots. The interproximal bone loss was seen between 36 and 37. Periodontal support of the mesial root of 36 was good [Figure 2]. Thus, it was diagnosed as chronic generalized gingivitis and localized periodontitis of lower left mandibular first molar. Treatment options may include extraction of 36 followed by a fixed partial denture or removable partial denture, or placement of an implant. The patient did not want to remove the tooth, so a conservative approach which included hemisection of the distal root of 36 followed by prosthetic replacement was done.

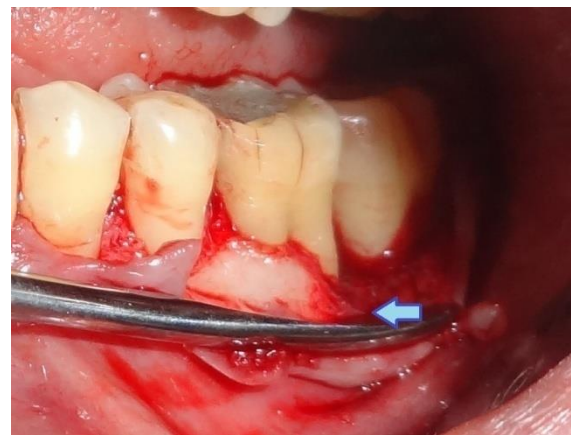


Figure 3: Flap Raised.

Treatment

Firstly, diagnostic impressions were made with the irreversible hydrocolloid impression material. Then intentional root canal treatment of 36 in a conventional manner was done. After 21 days of obturation, hemisection procedure was carried out. In this, local anaesthesia was administered, and then a crevicular incision was made from the first premolar to second molar region. A full thickness mucoperiosteal flap was elevated to provide adequate access for visualization and instrumentation and minimize surgical trauma [Figure 3]. After reflection of a flap, the bony defect was evident and curettage and debridement were done. A long shank tapered fissure carbide bur was used to make vertical cut facio-lingually towards the bifurcation area [Figure 4] and mesial root was extracted [Figure 5]. Care was taken not to traumatize bone and adjacent tooth while removing the mesial root. Debridement and irrigation of the socket were performed. Socket preservation was done by grafting the extraction site with “Fisiograf” [Figure 6]. Then buccal and lingual flaps were approximated to cover the graft. Sutures were placed with 3-0 black silk suture [Figure 7], and COE pack surgical dressing was done [Figure 8]. The surgical site was then allowed to heal for 4 weeks. The

patient was recalled after 3 months. Then, the restoration of hemisected tooth was planned with a fixed partial denture in relation to 35, a mesial root of 36 and 37 [Figure 9]. Radiographically, IOPA revealed good bone regeneration which indicates good uptake of the graft [Figure 10]. The recall was done periodically to assure the healing and success of the restoration.

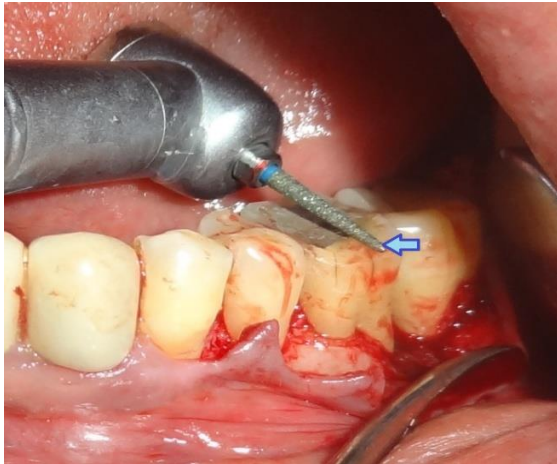


Figure 4: Tooth Cutting With Tapered Fissure Bur.



Figure 5: Extracted Mesial Root.



Figure 6: Graft Placement



Figure 7: Suturing With 3-0 Black Silk Suture.

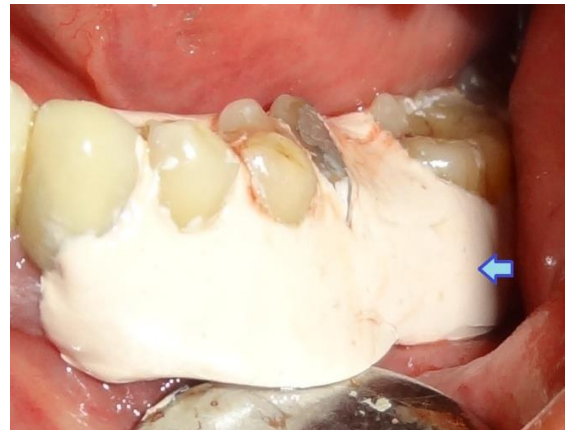


Figure 8: Coe Pack Placement.



Figure 9: Prosthesis Placement.

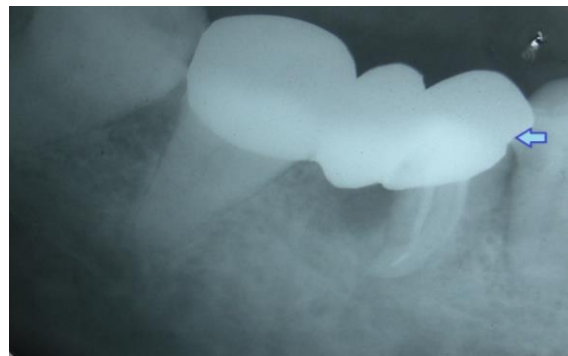


Figure 10: Postoperative Radiographic View

DISCUSSION

Hemisection is the splitting of a two-rooted tooth into two separate portions. This process has been called bicuspidization or separation. Many factors determine to choose one treatment plan over another when confronted with a furcation invasion of a mandibular molar. These may be enumerated in three areas:^[6]

a. Local factors — tooth anatomy, tooth mobility, crown root ratio, the severity of attachment loss, inter-arch and intra-arch occlusal relationship, strategic dental value for retention or removal.

b. Patient factors — health of a patient, importance of the tooth to the patient, costs, and time factor.

c. Clinician factors — a good case selection, diagnostic and treatment planning skills, awareness of therapeutic options and clinical insight or skill in providing service.

According to Newell,^[7] the advantage of the amputation is the retention of any part or the entire tooth. However, the disadvantage is that the remaining root or roots must undergo endodontic therapy and the crown must undergo restorative management.

Recently, Park et al.^[6] have suggested that hemisection of molars with questionable prognosis can maintain the teeth without a detectable bone loss for a long-term period, provided that the patient has optimal oral hygiene.

Saad et al.^[8] 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 a healthy and the remaining portion of the tooth can very well act as an abutment.

In a case report done by Jain^[9] on a case of excessive destruction of the mesial root due to the external root resorption and a fair amount of the distal root remaining with adequate bone support, hemisection was carried out with the removal of the mesial root and the crown. Remaining tooth structure was restored with composite and used as an abutment in crown and bridge after repositioning the occlusal contacts in a favourable position.

Akki S^[10] reported a case with missing mandibular left first premolar and grade-I mobility of mandibular left first molar and 9mm deep periodontal pocket on the distal root. Distal root was extracted. The treated teeth were successfully used as abutments for small bridges.

In the present case, the mesial root was extremely resorbed while the distal root could act as an abutment for the future prosthesis. As there was a bone loss from the mesial surface of the distal root of 46 and adequate bone support was present on the

distal surface of the distal root, in order to provide better bone support and faster bone healing, bone graft material was placed inside the socket of the extracted mesial root as well as on the mesial surface of the distal root.

CONCLUSION

Hemisection may be a suitable alternative to extraction and implant therapy and should be discussed with patients during consideration of treatment options. The success of the hemisection procedure depends on the supporting bone, the restorative treatment plan, and the oral hygiene of the patient. Regular periodontal maintenance and sufficient coronal restoration of the root resected teeth are important preconditions for long-term survival. This article presents a technique for the dentist to offer patients to maintain tooth structure where that structure is compromised.

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