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A Case Report on Relevant and Conservative Prosthodontic Management of Hemisected Molar

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Abstract

Recent advances in preventive prosthodontics and restorative dentistry along with increased desire of the patients to maintain their dentition has lead to treatment of the teeth which would have been removed otherwise. Many therapeutic measurements are followed over the years to retain grossly decayed teeth with periodontal involvement. Among all such procedures, hemisection is a viable option to retain the hopeless teeth and preserve the tooth structure and other associated tissues. A challenge which a dentist may encounter with is the prosthetic treatment of such teeth when their adjacent teeth are intact. According to the current goal of operative dentistry based on conservative treatment, it would be desirable to do the treatment in a manner resulting in minimal damage to the adjacent sound teeth. In this case report step-by-step procedure of prosthetic rehabilitation of mandibular molar with distal root amputation , not involving the surrounding teeth is described.

Keywords: Hemisection, Root resection, Conservative, Furcation, Bone loss, Prosthetic rehabilitation.

Introduction

From a functional and developmental point of view, the first permanent molars are the most important teeth, with a key role in occlusion[1]. Loss of first permanent molars, affects both the arches and also has adverse effects on occlusion[2]. A molar with gross caries may be unsuitable for restoration[3]. If the decay involves only one of the roots, hemisection becomes possible. "The term tooth resection denotes the excision and removal of any segment of the tooth or a root with its accompanying crown portion" [4]. This procedure is used to preserve as much tooth structure as possible rather than sacrificing the whole tooth[5]. Appropriate selection of case is very important after taking into consideration the periodontal endodontic and restorative indications as enlisted by Weine[6]. Present case report demonstrates successful conservative management of a hemisected mandibular left first molar with occlusal rehabilitation and fixed dental prosthesis.

Case Report

A 24-year-old female patient, reported to the Department of Prosthodontics and Crown & Bridge ,College of Dental Sciences, Davangere, Karnataka, India with the chief complaint of pain in left mandibular first molar. On intraoral examination, the tooth was tender to percussion, had grade II mobility and was carious. On probing, there was a 13mm deep periodontal pocket around the distal root of the tooth. On radiographic examination **(Fig 1)**, Grade III furcation involvement and periodontal bone loss was evident with distal root. The bony support of mesial root was intact. It was decided that the distal root should be hemisected after completion of endodontic therapy of the tooth.

Treatment Procedure

Endodontic Therapy: The access cavity preparation was done and working length estimated was confirmed radio graphically. After the biomechanical preparation, obturation of only mesial root was done by lateral condensation method. The access cavity chamber was then filled with glass ionomer and composite to maintain a good coronal seal.

Periodontal Therapy: Hemisection of the distal root and the crown was done with a vertical cut method facio-lingually .Long shank, tapered fissure carbide bur was used and crown was cut untill the furcation is reached. Distal half of tooth was extracted **(Fig 2)**.

Prosthodontic Therapy: Preliminary impression was made using irreversible hydrocolloid impression material, maxillary and mandibular diagnostic casts were obtained and mounted using the interocclusal record for a temporary prosthesis**(**(Rely X Temp NE).Tooth preparation was done in relation to mesial root of 36, to receive a porcelain fused to metal restoration. An occlusal rest seat was prepared on mesial aspect of 37. After final finishing of the abutment teeth, gingival displacement was done and final impression was obtained by using putty reline technique **(Fig 3)**. Provisional restoration was cemented onto prepared abutment using ZOE temporary cement (Rely X Temp NE) **(Fig 4)**. Master cast obtained was then sent to laboratory for the fabrication of PFM crown with an occlusal rest extension on its distal aspect, that would rest on mesio occlusal rest seat prepared on 37.Final prosthesis was verified in the mouth before glazing, and proximal contacts were checked. Occlusion was checked with articulating paper, and the pfm crown was cemented with type I GIC cement (GC Corporation) **(Fig 5)**. At follow-up, occlusion was stable, and the patient was satisfied with the outcome. No complications were noted when the patient was seen 15 days later.

Discussion

Hemisection serves as excellent treatment option to save those multi rooted teeth that are carious and are in advanced stage of periodontal disease of one root[6]. Buhler stated that hemisection should be considered before every molar extraction[7]. Saad et al. 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].

In the present case, patient was a good candidate for saving the mesial root. All available treatment options were given to the patient including implant therapy. Since the patient had the desire to save the natural teeth and also because of the financial considerations this treatment option was choosen. Thus hemisection of 36 was done with the removal of distal root followed by which prosthetic therapy was carried out.

1. There are several case reports where the edentulous area resulted from root resection was managed using FDP. In some conditions, the tooth adjacent to the edentulous area will be intact, as seen in the present case. In such cases, if

the abutment tooth is been prepared, it will fail to meet the conservative goals of operative dentistry. Therefore, in described patient, single crown restoration was preferred for 36**.**

2. Single crown with cantilever splinted to remaining root could have been given as a conservative treatment option. The main disadvantage of cantilever is that it creates class I lever system leading to fracture of abutment teeth adjoining the free end pontic. Technical failures are more common especially if the abutment teeth is nonvital as in this case[9]. So inorder to reduce the functional stress on the endodontically treated mesial half of 36, single crown restoration on 36 with a mesio occlusal rest on 37 was prepared. Thus it can meet conservative goals, as well as overcome the disadvantages of cantilever FPD.

3. Since only mesial half of 36 was prepared to receive crown, finish lines were placed slightly subgingival so as to achieve sufficient retention and emergence profile.

4. Light mucosal contact was given between the gingival portion of crown and the ridge, so that the patient would be able to pass the floss and maintain optimal oral hygiene.

5. Occlusal adjustment was done before cementation. Patient had definite canine protected occlusion that was maintained during cementation of final prosthesis.

6. Proper proximal contacts and contours were provided so as to maintain stability and occlusal harmony.

Conclusion

Every natural teeth must be given a chance to survive as long as possible. Success of hemisection procedure depends on accurate diagnosis, a good treatment plan considering the biomechanical factors, bone support and oral hygiene of the patient. Regular periodic recall and periodontal maintenance of remaining root are important preconditions for long term prognosis. If all these criteria are met, hemisection can be considered as a weapon in the arsenal of dental surgeon as an alternative to extraction and its replacement with dental implant or a conventional fixed dental prosthesis. With the recent advances and equipments available in dentistry, hemisection can be performed as a conservative dental treatment that meets the demands of esthetics as well as function.

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Legends Figure

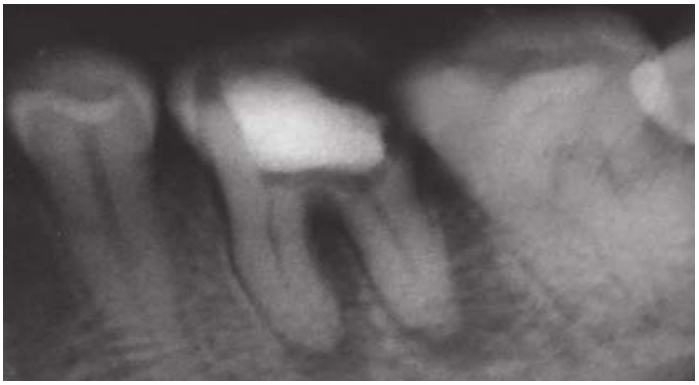

Figure 1: Pre Operative IOPA

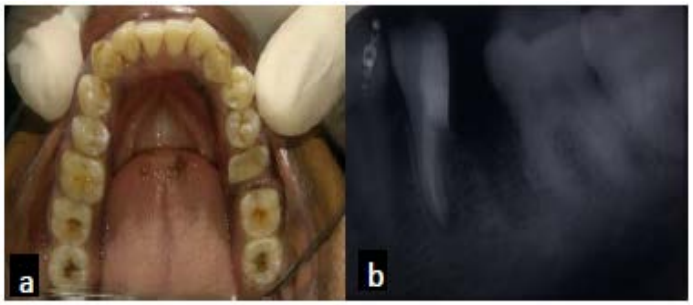

Figure 2: Clinical and rradiographic view of 36 after endodontic therapy and Hemisection

Figure 3: Crown preparation on 36 with mesioocclusal rest seat on 37

Figure 4: Provisional restoration cemented on 36

Figure 5: Final prosthesis cemented occlusal view and proximal view