Hemisection as an Alternative Treatment for Resorbed Multirooted Tooth - 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 may well be retained by removal of one or more of their roots. Hemisection of a mandibular molar may be a suitable treatment option when the decay or resorption is restricted to one root and the other root is healthy.this article describes a simple procedure for hemisection in mandibular molar by vertical cut method and its subsequent restoration. Hemisection and prosthetic rehabilitation yielded a satisfactory result.

Keywords : Hemisection, Resorption, Prosthetic Rehabilitation.

INTRODUCTION

Modern advances in all phases of dentistry have provided the opportunity for patients to maintain a functional dentition for lifetime. Therapeutic measures performed to ensure retention of teeth vary in complexity. The treatment may involve combining restorative dentistry, endodontics and periodontics so that the teeth are retained in whole or in part. Such teeth can be useful as independent units of mastication or as abutments in simple fixed bridges.¹ Thus tooth resection procedures are used to preserve as much tooth structure as possible rather than sacrificing the whole tooth.¹

H D 48, Sector I, Jankipuram, Lucknow. Contact No: +918756896109 Email: jaindratul@yahoo.co.in Date of Submission : 22-01-2011 Review Completed : 05-02-2011 Date of Acceptance : 08-02-2011 The term tooth resection denotes the excision and removal of any segment of the tooth or a root with or without its accompanying crown portion. Various resection procedures described are: root amputation, hemisection, radisection and bisection. Root amputation refers to removal of one or more roots of multirooted tooth while other roots are retained. Hemisection denotes removal or separation of root with its accompanying crown portion of mandibular molars. Radisection is a newer terminology for removal of roots of maxillary molars. Bisection / bicuspidization is the separation of mesial and distal roots of mandibular molars along with its crown portion, where both segments are then retained individually.¹

Root amputation procedures are a logical way to eliminate a weak, diseased root to allow the stronger to survive, whereas if retained together, they would collectively fail. Selected root removal allows improved access for home care and plaque control with resultant bone formation and reduced pocket depth.² Hemisection procedure represents a form of conservative dentistry, aiming to retain as much of the original tooth structure as possible.^{3,4}

CASE REPORT

A 35- years old male patient reported to the department of conservative and endodontics, K M Shah Dental College, Vadodara, India, with the chief complaint of pain in lower right back teeth since past one week. Patient was relatively asymptomatic before then. He developed continuous and throbbing pain in this region, which got aggravated during mastication and sleep. Patient gave past dental history of root canal treatment in 47, approximately 2 years back. Patient's medical history was not contributory.

On intra-oral examination, 46 was found to be grossly carious and full metal crown was present in relation to 47. On vertical percussion 46 was found to be sensitive. On probing, deep periodontal pocket was found in relation to 46. Vitality testing of 46 yielded no response.

On radiographic examination (figure 1), grossly carious 46 was evident along with the external root resorption of both

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Figure 1- Pre-Operative Radograph

the mesial and distal roots. 47 was found to have been improperly root canal treated.

In the view of above findings, it was decided to first carry out re-endodontic treatment of 47 followed by the hemisection of the mesial root of 46 while retaining- the distal root (as adequate bone support was present), followed by root canal treatment of the distal root and fabrication of crown and bridge over 45 and 47 using distal root of 46 as an abutment.

after the removal of full metal crown from 47, retreatment of the mesial canals was carried out (figure 2). After the proper obturation of 47, hemisection was carried out in relation to 46, with the vertical cut method.



Figure 2 - Intra-Oral Photograph Before Hemisection

A long shank, taper fissure carbide bur in high speed handpiece was placed along the buccal groove and a cut was made. The cut was channeled towards the center of the tooth and then directed towards the interproximal furcation opening of the mesial root. The bur was moved in the lingual and apical direction until the furcation area was reached. Once the bur had severed the floor of the pulp chamber, root was seperated from the remaining portion of the tooth (figure 3).



Figure 3 - Hemisection by Vertical Cut Method

A fine probe was passed through the cut to ensure separation. After seperation, the severed portion of the mesial root was removed with a extraction forceps (figure 4). The socket was irrigated with sterile saline to remove bony chips and debris.



Figure 4 - After Removal Of Mesial Root

The remaining portion of the distal tooth was trimmed to remove any ledges or sharp spicules, as these structures are potentially detrimental for periodontal maintenance. Bone graft material (perioglas, novabone products, usa) was placed inside the socket of the mesial root. Silk sutures (trulon, sutures india pvt ltd) were placed to approximate the flap (figure 5) and periodontal pack (coe-pak, gc america inc., usa) was applied.

After 7 days, the sutures were removed and the root canal treatment of the remaining portion of distal root was carried out. The working length was determined and the canal was biomechanically prepared by step back technique. The canal was obturated with lateral condensation method.



Figure 5 - Sutures Applied After Removal Of Mesial Root

After obturation composite built up was done in both 46 and 47 and crown preparation was completed on 46, 47 and 45 and fixed metal bridge was fabricated (figure 6).



Figure 6 - Post-Operative Radiograph After Prosthetic Rehabilitation

DISCUSSION

Root amputation/hemisection is an useful alternative procedure to save those multi-rooted 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. Also, accessibility of root furcation for easy separation as well as good bone support for the remaining root should be assessed.

In the present case, because of excessive destruction of the mesial root due to the external root resorption and fair amount of the distal root remaining with adequate bone support, hemisection carried out with the removal of the mesial root and crown. Remaining tooth structure was restored with composite and used as an abutment in crown and bridge after repositioning the occlusal contacts in favourable position. Recently, Park et al.7 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. 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 healthy and remaining portion of tooth can very well act as an abutment. 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.

Root amputation and hemisection should be considered as another weapon in the arsenal of the dental surgeon, determined to retain and not remove the natural teeth. With recent refinements in endodontics, periodontics and restorative dentistry, hemisection has received acceptance as a conservative and dependable dental treatment and teeth so treated have endured the demands of function.⁹ In conclusion, hemisection can be considred a suitable alternative to extraction and should be discussed with patients, during consideration of treatment options. The results of hemisection are predictable, and success rates are high if certain basic considerations are taken into account.¹⁰

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