

MULTIDICIPLINARY APPROACH FOR MANAGEMENT OF MANDIBULAR MOLAR WITH FURCATION INVOLVEMENT – A CASE REPORT

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ABSTRACT

The aim of modern dentistry is to conserve the natural dentition. Advances in dentistry and increased patient's desire to retain their teeth allowed us to carry out this present day mandate. Periodontally compromised teeth involving furcation and one of the root may well be retained by removal of the diseased root. Case report describes the procedure of radi-section in mandibular right first molar (46) and its subsequent prosthetic rehabilitation.

KEY WORDS: Endodontic Treatment, Furcation Involvement, Radisection

INTRODUCTION

Endodontic–periodontal lesions present challenges to the clinician as far as diagnosis and prognosis of the involved teeth are concerned. Etiologic factors such as bacteria, fungi, and viruses as well as various contributing factors such as trauma, root resorptions, perforations, and dental malformations play an important role in the development and progression of such lesions. Treatment and prognosis of endodontic-periodontal diseases vary and depend on the cause and the correct diagnosis of each specific condition. The correct diagnosis of endodontic -periodontic lesions is essential if the appropriate treatment is to be prescribed.

Perio-endo lesions

The relationship between periodontal and pulpal disease was first described by Simring and Goldberg in 1964¹. Since then the term 'perio-endo lesion' has been used to describe lesions due to inflammatory products found in varying degrees in both the periodontium and the pulpal tissues.

Pulpal and periodontal inter-relationship

The pulp and periodontium have embryonic, anatomic and functional inter- relationships.² They are ectomesenchymal in origin, the cells from which proliferate to form the dental papilla and follicle, which are the precursors of the pulp and periodontium respectively. These are separated by the formation and development of the tooth bud from overlying ectoderm into enamel and dentine. The embryonic development gives rise to

anatomical connections which remain throughout the life of the tooth. The apical foramen decreases in size as the proliferation of the Sheath of Hertwig continues. It remains patent and serves as the communication on which the pulpal tissues rely for nutrition and nervous innervation. As the root develops, ectomesenchymal channels get incorporated, either due to dentine formation around existing blood vessels or breaks in the continuity of the Sheath of Hertwig, to become accessory or lateral canals. The majority of accessory canals are found in the apical part of the root and lateral canals in the molar furcation regions. Tubular communication between the pulp and periodontium may occur when dentinal tubules become exposed to the periodontium by the absence of overlying cementum. These are the pathways that may provide a means by which pathological agents pass between the pulp and periodontium, thereby creating the perio-endo lesion.

Classification of perio-endo lesions

There are four types of perio-endo lesions and they are classified due to their pathogenesis.³

1. Endodontic lesions -an inflammatory process in the periodontal tissues resulting from noxious agents present in the root canal system of the tooth.
2. Periodontal lesions - an inflammatory process in the pulpal tissues resulting from accumulation of dental plaque on the external root surfaces.

3. True-combined lesions -both an endodontic and periodontal lesion developing independently and progressing concurrently which meet and merge at a point along the root surface.
4. Iatrogenic lesions - Usually endodontic lesions produced as a result of treatment modalities.

Hemisection is the removal of half of a tooth performed by sectioning the tooth and removing one root.⁴ Root amputation and Hemi section procedures were reported in the literature over 100 years ago. Classic papers by Hiatt and Amen listed the indications and described the techniques for root amputations.^{5, 6}

Usually, a molar with extensive furcation bone-loss may be unsuitable for restoration and have to be extracted. In such cases, the treatment options may be limited to removal of involved tooth followed by prosthodontic rehabilitation in the form of removable partial denture or a dental implant to replace the missing teeth⁷. Alternate procedures are used to preserve as much tooth structure as possible rather than sacrificing the whole tooth.⁸

From Endodontic perspective, Contra- indications include, if the remaining root may be in-operable for the necessary root canal treatment, also fusion or proximity of the roots may prevent their separation.⁹

Case report:

A 25 year old female patient reported with a chief complaint of pain in relation to her right lower back tooth. She had a history of flap surgery for aggressive periodontitis one year back.

On thorough intra oral examination, Mandibular right first molar was seen with grade -2 mobility. There was history of pain, slight swelling and associated symptoms. On probing the area, there was periodontal defect and on percussion, the tooth was tender and no decay. Radiographs revealed bone loss and furcation- involvement relation to tooth 46. (Figures 1 & 2)

On intra oral periapical radiographic examination, furcation involvement extending to the mesial root was noted. A diagnosis of retrograde pulpitis was made. Treatment plan included root canal treatment, followed by mesial root radisection, and prosthetic rehabilitation.

Based on the above findings and patient's oral hygiene status and medical status it was decided to do endodontic treatment in the distal root followed by radi-section of the mesial root so as to remove the diseased root.

Root canal treatment was initiated in the distal half of the tooth. The working length was determined and the distal canal was biomechanically prepared using step down technique. The canals were obturated with Gutta percha points in lateral condensation method and the chamber was filled with Zinc oxide eugenol temporary restorative material to maintain a good seal. Patient was recalled after one week, and amputation of the mesial root was done under local anesthesia, in horizontal - cut method. Initially full thickness mucoperiosteal flap was raised on the buccal side, and then the mesial root was cut with a bur till the bifurcation was reached. (figure-3). Once the separation was complete the mesial root was removed by delivering it buccally. (figure 4). The furcation area was trimmed to ensure that no residual debris will be present that could cause further periodontal irritation. The empty socket was thoroughly curetted.

The flap was sutured into position (figure 5), IOPA taken (figure 6) and patient dismissed. At one month recall crown preparation was done, additional wing preparation was done on tooth 45. Impressions were made and combination fixed prosthesis fabricated. The restoration was cemented using resin cement (figure 7) and patient was given hygiene instructions. (figure 8)

Discussion:

For this patient, radi- section was selected as a treatment option for bone loss and furcation exposure . The mesial root was resected because of the location of furcation exposure.

In the Mandibular first molar, the distal root is broader and straighter, making it more suitable as an abutment.¹⁰ The mesial root contains a longitudinal groove, which decreases its surface area and contraindicates the use of posts.



Figure 1: Pre Operative View

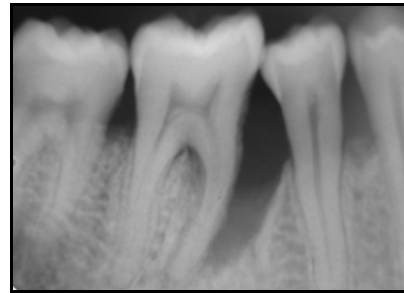


Figure 2: Preoperative I.O.P.A Radiograph



Figure 3: During Radisection



Figure 4: After Removing Mesial Root



Figure 5: Immediately After Radisection



Figure 6: Post Operative I.O.P.A. Radiograph



Figure 7: After Prosthetic Rehabilitation



Figure 8: During Maintenance

According to Newell the advantage of the amputation, hemi section is the retention of some or entire tooth.¹¹ The need for endodontic care before root resectioning has a long history in dentistry. It has remained today as a necessity in treating mandibular molar before the partial removal of their roots or separation of their crown.¹² However, failure to perform endodontic treatment first is not a contraindication for root resectioning, if it can be determined that a successful root canal filling is practical and possible.¹³

CONCLUSION:

Root amputation and hemi section should be considered as another weapon in the arsenal of the dental surgeon, determined to retain and not to remove the natural teeth.

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