Case Report

Hemisection—A Challenge for Perio-endo Lesions: A Case Report

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ABSTRACT

The perio-endo lesions confront the clinician as far as diagnosis and prognosis of the affected teeth is concerned. Hemisection is the treatment choice for perio-endo lesions to preserve the remaining part of the molar having sound periodontium. It is a resection of periodontally involved root along with the associated crown portion. Prognosis and treatment of perio-endo lesions depend on the severity of bone loss, root trunk length, degree of root separation, curvature of root, ability to eradicate the osseous defect, and restorative and oral hygiene procedures. In this case report, root canal treatment and hemisection were successfully performed to treat advanced perio-endo lesions. By this way, natural tooth and surrounding structures were preserved and thereby cost was lesser than the other treatment alternatives.

KEYWORDS: Endodontic, furcation involvement, hemisection

INTRODUCTION

In 1964, Simring and Goldberg¹ stated that there is a correlation between periodontal disease and pulp. The periodontium communicates with dental pulp through various pathways such as dentinal tubules, apical foramen, and lateral and accessory canals. These are the pathways through which pathological agents pass between pulp and periodontium, thereby creating the perio-endo lesions.² The mainly used classification for perio-endo lesion was given by Simon et al.³

Treatment of periodontal-endodontic lesions requires both endodontic and periodontal therapy. This article presents a case report of primary periodontal lesion with secondary endodontic involvement in lower molar treated by conventional endodontic treatment and hemisection.

CASE REPORT

A 40-year-old man reported to the department of periodontology with a complaint of dull pain and sensitivity in the lower left back tooth region of jaw for the past 1 year. Though the pain was dull and intermittent in nature, yet it aggravated on mastication. Along with this, he had sensitivity, which aggravated when consuming hot or cold substances. No history

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of any systemic disease was reported. On intraoral examination, it was found that the tooth 36 was tender on percussion with grade I mobility. Probing depth was 8 mm around the distal root of the tooth [Figure 1]. The intraoral periapical radiograph showed severe vertical bone loss surrounding the distal root along with furcation involvement. The bone support of the mesial root was completely intact. Then, electrical pulp tester showed that the tooth was non-vital. Thus, it was identified as perio-endo lesion in relation to 36 region. So, the distal root of 36 should be hemisected after completion of phase I and endodontic therapy on the tooth.

After the completion of endodontic therapy, periodontal flap surgery along with hemisection was planned to be done after 3 months [Figure 2]. At that time, full-thickness mucoperiosteal flap was elevated in relation to 36 region under mandibular block by giving crevicular incision from the first premolar to the second molar, and inflammatory granulation tissues were removed with the help of Gracey curettes to expose vertical bone defect [Figure 3]. Then, the vertical cut was applied faciolingually through the buccal and lingual developmental grooves of the tooth, through the pulp chamber, and through furcation to resect the distal root along with its crown. A high-speed long-tapered fissure carbide bur was used to create vertical cut toward the bifurcation area, and distal root was extracted atraumatically [Figure 4]. The distal socket was thoroughly debrided and irrigated with sterile saline to remove bony chips if any. Finally, the flap was approximated and sutured with 3-0 black silk suture [Figure 5]. The occlusal table was reduced to redirect the forces along the long axis of the mesial root.
periapical radiograph showed good condition of mesial root and extraction socket of the distal root [Figure 6]. The patient was recalled after 1 week to remove the suture. Healing was uneventful. Radiograph, taken after 6 months, displayed good healing, and the probing pocket depth was reduced with no mobility [Figures 7 and 8].

**Discussion**

The level of success of a treatment is in accordance with thorough clinical knowledge, diagnosis, and prognosis as well as multidisciplinary treatment plan. However, treating the complex periodontal-endodontic lesion is still a tedious task in today's clinical practice. Treatment of primary periodontal with secondary endodontic lesions requires both endodontic and periodontal therapy.

A lesion may start as a separate entity, either through periodontium or pulp, but there is a chance to have combined effect at the time of presentation. In this case, if merely endodontic treatment is carried out, the periapical lesion will heal only up to the site where the periodontal lesion starts. Similarly, if periodontal therapy alone is done then only the crestal bone may heal. Therefore, the treated lesion will not be healed completely due to continuous irritation and inflammation from the untreated segment.[4] Whenever a clinician cannot make a definitive diagnosis, it is better to initiate endodontic therapy before periodontal therapy for optimal healing. Preferably, treatment results should be evaluated in a period of 2–3 months, and in accordance, periodontal treatment should be initiated. This sequence of treatment has adequate time for initial tissues to heal along with the reduction
in the potential risk of introducing bacteria and their by-products during the initial phases of healing. Moreover, the assessment of periodontal condition can be done perfectly.[5]

The presence of furcation involvement in case of peri-endo lesion is a major challenge for treatment plan. Various treatment methods are there for the treatment of furcation involvement such as open flap debridement, osseous resection, regenerative procedure, and root resection.[6]

Hemisection has been used in cases of advanced bone loss in furcation involvements, which refers to bifurcation of a molar and removal of diseased root with crown portion.[7] The main advantage of such treatment is that the conversion of furcation involved multirooted tooth into non-furcated single-root tooth, which provides favorable environment for oral hygiene maintenance.[8]

The hemisection is one of the treatment procedures before subjecting the molars for extraction, because it provides long-term success with biological cost saving.[8] As per Weine,[9] the following conditions indicate for hemisection procedure:

1. Periodontal considerations
   a. Severe vertical bone loss, which involves only one root of a molar tooth
   b. Grade III and IV furcation involvement
   c. Difficult to maintain adequate oral hygiene in adjacent tooth
   d. Exposed root due to dehiscence
2. Restorative and endodontic considerations
   a. Periodontal failure of an abutment tooth in a fixed bridge
   b. If one root cannot be completely instrumented due to anatomic reasons or heterogenic factors
   c. Vertical fracture in one root
   d. Severe destruction of one root due to resorption, caries, trauma, or perforation

After hemisection, root fracture is one of the complications. So occlusal modifications are mandatory to be done for balancing the occlusal forces on the remaining root. Hemisection is a better treatment option instead of extraction of tooth and its replacement with either a dental implant or a conventional prosthesis.[8]

**Conclusion**

Hemisection is the appropriate treatment option for molars with furcation involvement, which preserves the remaining part of the tooth having sound periodontium. This case report is about the treatment of periodontally affected tooth by multidisciplinary treatment approach. The level of success of the hemisection procedure depends on the strength of the supporting bone of the remaining root of the tooth, the restorative treatment plan, and the oral hygiene of the patient. Thereafter, regular periodontal maintenance and adequate coronal rehabilitation of the resected teeth are important for long-term survival.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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