

***Case Report*****Anchoring a Floating Tooth Through Multidisciplinary Approach**

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**ABSTRACT:** The pulp and periodontium are intimately related owing to the various communications present between the two. So a disease in one can progress to the other posing difficulties in the management of such lesions. Proper diagnosis is essential in endodontic-periodontal lesions so that proper treatment can be prescribed. Treatment of combined endo-perio lesions is complex and proper sequence of management becomes mandatory for successful outcome. This article presents a case of primary periodontal with secondary endodontic lesion, which was initially given a poor prognosis but showed favorable bone regeneration following endodontic and periodontal treatments.

**Key words:** Endo-Perio Lesion; Endodontic; Periodontal; Apical Foramen; Periodontal Abscess

**INTRODUCTION**

Endodontic-periodontal lesions are challenges to the dentists, in essence to the presence of disease in both endodontic and periodontal complex. Diagnosis and treatment of the involved teeth becomes guarded, if not handled judiciously. Etiologic factors such as bacteria, fungi and viruses as well as various contributing factors such as trauma, root resorption, 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 relationship between periodontal and pulpal disease was first described by Simring and Goldberg in 1964.<sup>1</sup> Since then the term 'perio-endo lesions' has been used to describe lesions.

The pulp and periodontium have embryonic, anatomic and functional inter-relationships.<sup>2</sup> The dental pulp communicates with the periodontal ligament through the various routes such as dentinal tubules, lateral & accessory canals, apical foramen, palatogingival groove, root perforations, vertical root fractures, etc.<sup>3</sup> Based on etiology, diagnosis, prognosis and treatment, Simon classified endo-perio lesions as (1) primary endodontic lesion, (2) primary endodontic with secondary periodontal lesion, (3) primary periodontal lesion, (4) primary periodontal with secondary endodontic lesion and (5) true combined lesion.<sup>4</sup> The differential diagnosis of endodontic and periodontal diseases can be

challenged but a correct diagnosis has a vital importance so that appropriate treatment can be provided. The treatment outcome largely depends upon the management of primary lesion and in combined lesion both endodontic and periodontal component of the disease should be treated.<sup>3</sup> This case report presents an endo-perio lesion managed by an interdisciplinary approach and describes the importance of proper diagnosis and treatment sequence.

**CASE REPORT**

A 28 year old female patient reported to the Department of Conservative Dentistry and Endodontics, Rama Dental College, Kanpur, with the chief complaint of pus discharge and mobility of tooth in the lower left back region of the mouth. The medical history was non contributory. Intraoral examination revealed periodontal abscess in relation to non carious mandibular left first molar. The abscess was associated with sinus opening seen on the buccal aspect of 36. UNC15 probe was used to measure the probing pocket depth and was found to be 11mm on mesial and 12mm distal to 36. There was Grade III bleeding on probing according to Muhleman Bleeding Index and the tooth also had grade III furcation involvement. The tooth was tender on percussion and had grade III mobility.

Preoperative radiograph showed bone loss extending to the apex of both mesial and distal roots (Fig 1). The tooth seemed to be floating without any bony attachment. Pulp vitality test using electric pulp tester suggested non vital

tooth. A diagnosis of primary periodontal with secondary pulpal lesion was made (Simon's class IV lesion).



*Figure 1: Pre operative Radiograph showing 36 with bone loss extending to the apex of the multi rooted teeth and involving the furcation area.*

A thorough treatment plan was made in consultation with both endodontist and periodontist. It was decided to drain the abscess first and then go for endodontic treatment following scaling and root planing. After endodontic treatment, periodontal surgery was planned. According to the treatment plan, first abscess drainage was done by breaking the locules through the sinus tract with the help of 13-14 Gracey curette. The pus was drained using digital pressure. Thorough irrigation was done using betadine rinse. Antibiotic (Amoxicillin 500mg tds for 8 days) was prescribed.

The patient was recalled for scaling and root planing following abscess drainage and complete shrinkage of the abscess area was seen with no signs of pus and reduced bleeding on probing. Significant gingival recession was seen due to the healing of periodontal tissues following initial periodontal treatment. After non surgical periodontal therapy, provisional splinting was done using a fiber splint on the buccal aspect of 34, 35, 36 and 37 (Fig 2). After 1 week of placement of the splint, endodontic treatment was started.



*Figure 2: Clinical photograph showing fiber splinting in place extending from 34 to 37 teeth.*

Adequate isolation of the tooth was obtained and access cavity was prepared (Fig 3). Patency of all the canals was determined with #15 K-files. Radiograph was taken to determine the working length. Coronal flaring of root canals was performed using S1 and SX ProTaper rotary instruments with XSmart endodontic motor. Instrumentation was completed using a series of ProTaper Nickle titanium rotary instruments with XSmart endodontic motor. During biomechanical preparation with rotary instruments, copious irrigation was done in all the canals with 5% sodium hypochlorite solution followed by 17% EDTA. Final rinse was done with saline. All canals were dried and an inter appointment dressing with calcium hydroxide was placed and a temporary filling was placed in the access cavity. Patient was kept on medication.



*Figure 3: IOPA after access opening and with temporary filling in place in 36.*

Three weeks later, the tooth was asymptomatic and the fiber splint was removed. The tooth showed grade II mobility which was initially grade III. The temporary filling was removed from the access cavity and the canals were irrigated with 5% sodium hypochlorite followed by 17% EDTA so as to remove the calcium hydroxide from the canal. After the final rinse with normal saline, master cone radiograph was taken with F2 protaper gutta percha cones. Then all the canals were dried with absorbent points and obturation was completed using AH plus resin sealer (Fig 4). The access cavity was restored with an IRM. The patient was recalled after 1 week for periodontal regenerative procedure.



*Figure 4: Post obturation X ray showing an increase in bone around the roots of teeth.*

The patient was recalled after 3 months for further periodontal treatment. Periodontal flap was raised using internal bevel and crevicular incisions. Thorough curettage of granulation tissues and root planing was done. Although treatment plan included placement of bone grafts, due to gingival recession it was decided not to place bone graft during surgical procedure. Sutures were placed and periodontal pack given. Patient was recalled after one week and the surgical site had healed uneventfully.

On recall visit after 3 months the tooth was found to be asymptomatic. The probing depths were 4mm all around the tooth and no inflammation was seen on the soft tissues. Radiographic examination showed evidence of regeneration of periradicular bone. Six months

follow up radiographs showed bone gain in the mesial and distal aspects of the tooth (Fig 5). No mobility was observed with the tooth. At this time, IRM was removed and cavity was restored with silver-amalgam restoration. The patient returned after 1 year, at this time the tooth was asymptomatic and the probing depths were still 4mm all around the tooth (Fig 6). The tooth was symptom-free since completion of the root canal; hence, patient was advised to restore the tooth with full coverage metal crown.



*Figure 5: Follow up radiograph after 6 months with bone deposition in the furcation area and increased bone deposition in the apices of root.*



*Figure 6: Radiograph after 1 year showing more bone deposition in the distal aspect of the tooth and increased bone in the furcation area.*

Supportive periodontal therapy was provided to the patient during and after treatment. The patient was cooperative and followed the instructions properly.

## DISCUSSION

Periodontal disease initiates in the marginal gingiva and progresses to involve the deeper structures, periodontal ligament and alveolar bone. The apical progression of periodontal pocket may continue until the apical tissues are involved, if not treated. In such case the pulp may become necrotic as a result of infection entering via lateral canals/apical foramen.<sup>5</sup> The effect of progression of chronic periodontitis on the vitality of pulp is controversial.<sup>6</sup> If the blood supply circulating through the apex is intact, the pulp has good prospects for survival. It has been reported that pulpal changes resulting from periodontal disease are more likely to occur when the apical foramen is involved.<sup>3,7,8</sup> This problem, however, develops over a longer period. In these cases, bacteria originating from periodontal pocket are the most likely source of root canal infection. A strong correlation between the presence of microorganisms in root canals and their presence in periodontal pockets of advanced periodontitis has been well demonstrated.<sup>9,10</sup>

Correct diagnosis and proper treatment plays a very important role for the success of the treatment of endo-perio lesions. The main factors to consider for treatment decision-making are pulp vitality, type and extent of the periodontal defect. A primary endodontic lesion draining through the attachment apparatus should be treated initially by endodontic therapy after confirmation by accurate diagnostic tests. On the other hand, primary periodontal disease should only be treated by periodontal therapy. Primary periodontal lesions with secondary endodontic should first be treated with endodontic therapy. Treatment results should be evaluated in 2–3 months and only then periodontal treatment should be initiated. This sequence of treatment allows sufficient time for initial tissue healing and better assessment of the periodontal condition. The potential risk of introducing bacteria and their byproducts during the initial phase of healing is also reduced.<sup>7,11</sup>

In the present case, there were deep periodontal pockets and intraoral periapical radiographs showed bone loss surrounding the two mandibular roots, extending up to the root apices. Since there was no caries associated with the tooth, the most likely cause of pulpal involvement could be through the apical foramen. The involvement of the pulp was shown by the non response to vitality test. Thus a diagnosis of primary periodontal with secondary endodontic lesion according to Simon's classification was made.

The treatment sequence for treating such cases is to address the endodontic component first. For this patient since there was periodontal abscess and grade III mobility, drainage of abscess and provisional splinting was done first. The patient underwent endodontic treatment and results after 3 months were favorable in the form of clinical stability of the tooth. After the completion of endodontic treatment, periodontal surgery was carried out to curette the granulation tissue and promotes new attachment formation. Six months after initial visit, the radiographs revealed bone formation around the tooth indicating successful management of the tooth.

Although no regenerative materials were used in the form of bone grafts or guided tissue regenerative membrane due to the gingival recession, the reformation of bone can be attributed to the thorough debridement of the endodontic and periodontal tissues, which stimulated the innate regenerative capacity of these tissues.

**CONCLUSION:** An accurate diagnosis is mandatory for the successful management of endodontic-periodontal lesions. Both the endodontic and the periodontal component of the lesion should be treated effectively in a proper sequence as they are interdependent. In case of primary periodontal with secondary endodontic lesions, prognosis and outcome vary according to the management of periodontal tissues. The treated tooth was initially given a poor prognosis and many dentists had advised extraction of the same. But interdisciplinary and meticulous nature of

management of the case helped in retaining the tooth, which made this case outstanding.

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