

Non-Surgical Endodontic management of an Endo-Perio Lesion: A Case Report

Abstract

Tissues of dental pulp and periodontium are inter-linked from the embryonic stage. As the tooth matures and the root is formed, three main avenues are created between pulp and periodontal ligament, i.e. dentinal tubules, lateral and accessory canals, and apical foramen. These are the pathways that may provide a means by which pathological agents pass between the pulp and periodontium, thereby creating the endo-perio lesion. Lateral canals play an important role in the spread of microbial products from pulp to periodontium. Therefore, it is natural to expect that any part of periodontium can get affected by pulpal inflammation and vice-versa. Treatment and prognosis of endodontic - periodontal diseases vary depending on the cause and correct diagnosis of each specific condition. This article presents successful healing of primary endodontic lesion with secondary periodontal involvement after non-surgical endodontic management with long term follow-up.

Key Words

Endo - perio lesions; accessory canals; pulpal pathology

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INTRODUCTION

The effects of periodontal diseases on pulp first described Turner and Drew (1981). Pulpal and periodontal disease relation first described by Simring and Goldberg in 1964. Endo-perio lesions encountered occasionally pose difficulty to the clinician in diagnosis and complicate the treatment.^[1] Apical foramen the main access route between pulp and periodontium, with the participation of all root canal system, accessory, lateral, and secondary canals as well as the dentinal tubules through which the bacteria and its products contaminate the medium. If lesions are not well treated and canals are not correctly disinfected and sealed, they house bacterial necrotic rests, which account for the progression of lesion or even the endodontic re-infection^[2]. Correct diagnosis of the perio- endo lesions is of fundamental importance to determine the treatment and prognosis. The factors used to differentiate the symptomatology should be taken into account, helping in the diagnosis. Clinical history of the patient brings important information. In primary endodontic lesions with secondary periodontal involvement, root canal contamination occurs because of the caries, fractures, cracks, trauma or coronal microleakage^[3].

Pulpal inflammation and necrosis leads to inflammatory response in the periodontal ligament, apical foramen, and underlying alveolar bone presenting as deep localized periodontal pocket extending to the apex, resulting in localized diffuse swelling. Following case report describes non-surgical management of primary endodontic secondary periodontal lesion with long term follow-up.

CASE REPORT

35 year old male patient reported to Department of Conservative Dentistry and Endodontics, DY Patil University, School Of Dentistry, Navi Mumbai with the chief complaint of pain and discomfort on chewing in lower left back region of jaw since 8months accompanied by intermittent swelling in relation to 36. Pain was dull aching and intermittent. Medical history was noncontributory. Intra oral examination revealed deep restoration with 36, occlusal caries with 37. Probing depth approx 7mm with 36, grade II furcation involvement, sinus tract seen in relation to 36. Palpation revealed tenderness on percussion and grade I mobility. Tooth showed delayed response to electric and heat pulp testing. Pretreatment radiographs revealed pathologic radiolucency with mesial and distal root, severe



Fig. a: Pre-operative radiograph

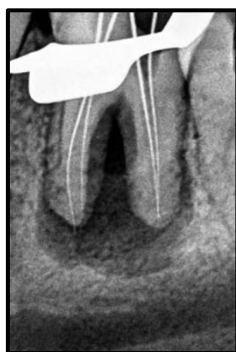


Fig. b: Working length radiograph



Fig. c: 1 week post-operative



Fig. d: 3 week post-operative



Fig. e: 6 week post-operative



Fig. f: Protaper cones



Fig. g: Obturation



Fig. h: Post-obturation



Fig. i: 3 month post-obturation



Fig. j: 6 month post-obturation



Fig. k: 9 month post-obturation

bone loss around interradicular area and the apex of mesial and distal root of 36 (Fig. a). Based on clinical and radiographic findings, lesion diagnosed as **TYPE 2** - primary endodontic with secondary periodontal involvement according to classification based on etiology by Simon, Glick and Frank (1972). **TYPE 1** - Requiring endodontic treatment only based on treatment plan, Grossman classification (1988).

CASE REPORT

Tooth isolated under rubber dam. Old restoration removed and caries excavated. Access prepared with endodontic access bur. Three canal orifices located using DG16 explorer - mesiobuccal, mesiolingual and distal. Working length determined by electronic apex locator and confirmed

radiographically with #15 K-files (Fig. b). Cleaning and shaping carried out using rotary protaper in adjunct with copious irrigation with normal saline, 2.5% sodium hypochlorite solution and 17% EDTA. Calcium hydroxide closes dressing given and followed up after a week (Fig. c). At next visit, calcium hydroxide dressing was repeated as canals were wet, patient recalled after 3 weeks (Fig. d). After 3 weeks pain and swelling subsided, soft tissues looked normal, draining sinus subsided, patient was asymptomatic. Close dressing given. At 6th week (Fig. e), after rubber dam isolation, calcium hydroxide was removed from canals and irrigated using 17% EDTA, sodium hypochlorite 2.5%. Master cone radiograph taken (Fig. f). Canals rinsed with normal saline, dried with absorbent

points and obturated by protaper gutta-percha cones and zinc-oxide eugenol sealer by cold lateral compaction (Fig. g). Temporary restoration placed and patient recalled after 1 week. At 1 week follow-up patient was asymptomatic permanent restoration was carried out using composite (Fig. h). Patient explained about the follow-up and the tooth was kept under observation.

Recall

The tooth was symptom-free since completion of the treatment. Regular follow-up at 3, 6 and 9 months clinically and radiographically (Fig. i, Fig. j & Fig. j). At three months, tooth was asymptomatic. Probing depths were 3mm all around the tooth and no inflammation were seen on soft tissues. Radiographic examination revealed evidence of periradicular bone regeneration. Patient was recalled every 6 weeks for follow-up. Mobility was absent, patient was asymptomatic and satisfactory periapical and periodontal healing was observed.

DISCUSSION

Both pulp and the periodontium are closely linked to each other, through apical foramen, accessory canals, dentinal tubules of root. One can interfere on the integrity of other. Although these communication routes exist, mechanism of direct transmission of the periodontal infection to the pulp is controversial. Rubach and Mitchell affirmed that periodontal disease may affect the pulp when there is exposure of the accessory canals through the apical foramina and canaliculi in the furcation. Adriaens *et al.*, reported that bacteria coming from the periodontal pockets may contaminate the pulp through the dentinal tubules that are exposed during root planning and scaling, serving as a microorganism reservoir resulting in the recolonization of the root surface treated. Seltzer *et al.*, contradicted this idea, because even with the removal of the cementum during the periodontal therapy in vital teeth, the pulp tissue will be protected against the harmful agents through forming reparative dentin. Langeland *et al.*, affirmed that pulp would only be affected by periodontal disease if apical foramen is involved. Endo-perio lesions are challenging to clinicians as far as diagnosis and prognosis of the teeth are concerned. Because interpretations vary as to which came first, clinical data gathering in endo-perio lesions is complex, requiring history review, pulp vitality testing, pocket and furcation probing, tooth mobility determinations, clinical and radiographic

examination. Correct diagnosis is essential to determine the treatment and long-term prognosis.

First step for proper diagnosis is vitality test. Vitality tests do not provide histological status of dental pulp, their ability to register pulp vitality is quite satisfied. Infected root canal causes chronic inflammatory reaction extending into gingival sulcus and draining through the sinus tracts. If rest of the dentition is periodontally healthy, root cracks and fractures are ruled out; healing of the periodontal tissues is expected after endodontic treatment as observed in this case. Hence, further treatment requirement should always be considered followed by observation period of at least 3 months. In this case report, detailed examination done pre-operatively shows deep occlusal restoration, draining sinus, periodontal pocket (7mm) with 36. Grade I mobility and grade II furcation involvement. Patient was systemically healthy. Prognosis of the tooth considered to be fair. Chief complaint of patient was pain and discomfort on chewing with 36 accompanied by intermittent swelling. Vitality tests gave delayed response suggesting pulpal involvement. Radiographically, inter-radicular bone loss was extending till apex of mesial and distal root confirming the pulpal and periodontal involvement of the lesion. Hence tooth was treated as primary endodontic with secondary periodontal involvement. Possible influence of endodontic treatment on healing response of furcation defects is related to accessory canals and permeable areas of dentin and cementum.^[4,5] Accessory canals found in 30–60% molars furcation area, predisposes it a zone of intense communication between pulp periodontium.^[6] Proper endodontic treatment is a key factor for success. Poor endodontic treatment leads to canal re-infection and failure.^[7] Harrington *et al.*, affirmed that endodontic treatment should occur prior to periodontal therapy, as it provides time for initial periapical healing and evaluation of periodontal conditions. Root canal disinfection is crucial while achieving regeneration of the periradicular tissues.^[8,9] In this case, there were deep probing depths along more than one surface of the tooth, extensive bone loss around the root and interradicular area. Successful disinfection and filling of the root canal system led to regeneration of the attachment apparatus without further periodontal therapy. Calcium hydroxide was used as the intracanal inter-appointment dressing to disinfect the root canal system further and to

evaluate the improvement of the surrounding tissues at recall appointments. Multi-visit endodontics was practiced and intracanal medicament was found to be very useful in reducing inflammation and favoring repair.^[10] Proper endodontic procedures and techniques are key factors for successful management of endo-perio lesion. Treatment results should be evaluated in 2-3 months and then further periodontal treatment should be considered. This sequence of treatment allows sufficient time for initial tissue healing and better assessment of the periodontal condition.

CONCLUSION

Based on literature review, we conclude that it is extremely important for the dentist to differentiate the origins of the perio-endo lesions, including all routes of communication between the pulp and periodontium which act as possible “bridges” and enabling the dissemination of infection from one site to another. Differential diagnosis of endo-perio lesions is not always straightforward and requires clinical data accumulation from a number of diagnostic tests to obtain a correct diagnosis. Thorough knowledge and correct diagnosis results in greater chances of obtaining success in the treatment of endodontic- periodontic lesions.

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