Case Report

Management of Endodontic-periodontal lesion: a simplified approach.
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Abstract
The pulp and periodontium have embryonic, anatomic and functional inter-relationships. This interrelationship has been a subject of speculation, confusion and controversy for many years. An endo-perio lesion can have a varied pathogenesis which ranges from quite simple to relatively complex one. These lesions often present challenges to the clinician as far as diagnosis and prognosis of the involved teeth are concerned. It is very essential to make a correct diagnosis so that the appropriate treatment can be provided. To make a correct diagnosis the clinician should have a thorough understanding and scientific knowledge of these lesions and may need to perform restorative, endodontic or periodontal therapy, either singly or in combination to treat them. Therefore, this presentation will highlight the diagnostic, clinical guidelines and decision-making in the treatment of these lesions from an Endodontist’s point of view to achieve the best outcome.

Keywords
endoperio lesion; accessory canals; furcation; calcium hydroxide

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Introduction

Endodontic-periodontal lesion is a clinical manifestation of the pathologic/inflammatory intercommunication between pulpal and periodontal tissues via open structures such as apical foramina, lateral, accessory canals, and dentinal tubules (1). The apical foramen is the most important but by no means the only location where these tissues meet. Lateral and accessory canals, mainly in the apical area and in the furcation of molars, also connect the dental pulp with the periodontal ligament. On the basis of the pathologic origin, Simon et al (2) classified endodontic-periodontal lesions into Primary endodontic lesions, primary endodontic lesions with secondary periodontic involvement, primary periodontic lesions, primary periodontic lesions with secondary endodontic involvement, or true combined lesions. Formulating a differential diagnosis among combined lesions has been challenging because most often clinicians do not have a complete history of the course of disease progression.

Therefore, diagnostic steps should include thorough patient-reported dental history, visual inspection for presence of sinus tract and severe inflammation in association with large restoration and anatomic anomalies (3), radiographic examination, results of clinical findings including percussion and palpation, routine periodontal assessment for presence of mobility or deep probing depth, and pulp vitality testing (1). The electric pulp testing and cold tests are customarily accepted as being reliable in differentiating between pulpal and periodontal disease.

Calcium hydroxide is a multipurpose agent, and there have been an increasing number of indications for its use in endodontics. Some of its indications include inter-appointment intracanal medicaments, endodontic sealers, pulp capping agents, apexification, pulpotomy and weeping canals. Calcium hydroxide used as intracanal medicament in endo-perio lesions may promote rapid healing and repair.

Case Report

A 52 year-old- female patient was referred from her general dentist for a second opinion before extraction of mandibular right first molar (#30), with history of discomfort and recurrent swelling during the past few years. The patient presented with a chief complaint of “discomfort, swelling and sore gum” around the tooth. Medical history was non-contributory. In dental history porcelain fused to metal crown was placed on tooth #30 since more than 15 years. Extra-oral and oral cancer screenings were within normal limit. Intra-oral examination revealed fluctuant swelling with a sinus tract on the cervical area and grade II mobility with tooth #30 (fig.1).

The tooth was sensitive to percussion and palpation. Probing depth of 12 mm on the buccal side (fig.2) and through and through
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Furcation involvement with Naber’s probe was noted.

Electric pulp testing and cold test were done to check for tooth vitality, which confirmed that the tooth #30 was nonvital. Intra oral periapical radiograph (IOPA) showed widening of periodontal ligament space and radiolucency in the furcation area with tooth #30 (fig.3).

Diagnosis of primary endodontic lesion with secondary periodontal involvement was established. Treatment planning was done as a combination of a root canal treatment and periodontal scaling along with deep root planning.

Root canal treatment was started under local anaesthesia (2% Lidocaine with 1:100000 epinephrine) as inferior alveolar nerve block. Tooth isolation was done with rubber dam and access cavity was prepared through the crown. Root canal debridement, cleaning and shaping was done using rotary endodontic files and full strength sodium hypochlorite. Non-sitting calcium hydroxide was placed in the root canal system as intra-canonical medicament. The access cavity was temporized with cavit. After a week, scaling and deep root planning were performed and patient was kept on recall.

Six weeks later tooth #30 was asymptomatic, responded normal to percussion, palpation and mobility tests. No swelling was noticed and the probing depth was within normal limit (3mm all around the tooth) (fig.4, 5).

Figure 3. Preoperative IOPA showing widened periodontal ligament space and radiolucency in the furcation area with tooth #30.

Figure 4. Showing absence of swelling and the probing depth of 3mm all around the tooth.
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Figure 5. Showing absence of swelling and the probing depth of 3mm all around the tooth.

Under rubber dam isolation the temporary filling was removed, calcium hydroxide washed off and warm vertical obturation was done using gutta percha and resin sealer (AH26) (fig.6).

Figure 6. Post obturation radiograph showing well obturated canals of tooth #30 by using warm vertical compaction technique.

Final restoration was done with composite resin and the patient was advised to come back on 6 months recall. After six months the patient reported with asymptomatic tooth and normal periodontium. IOPA radiograph showed radio-opacity in the furcation and periradicular area (fig.7) suggestive of healing process.

Figure 7. Six months follow up radiograph showing radio-opacity in the furcation and periradicular area of tooth #30 suggestive of healing process.

On 12 months recall patient reported with tooth in normal function and IOPA radiograph showed complete healing of a lesion with normal lamina (Fig. 8).

Figure 8. Twelve months follow up radiograph showing complete healing of a lesion with normal lamina of tooth #30.

Discussion

The endo-perio lesions present challenges to clinicians as far as diagnosis and prognosis of the involved teeth are
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Concerned. Diagnosis of primary endodontic disease and primary periodontal disease usually presents no clinical difficulty. The first step for proper diagnosis is the vitality tests. Although the vitality test cannot provide the histological status of the dental pulp, their ability to register pulp vitality is quite satisfied. The ability of vitality tests to detect non-sensitive reaction represented a necrotic pulp was reported as 89% with the cold test and 88% with the electrical test (4).

The lateral canals play an important role in spread of the infection from pulp to periodontal tissues. There are many studies where they have shown that accessory canals in root are more common in molars. Bender and Seltzer in 1972 confirmed the presence of more number of lateral and accessory canals in the bifurcation and trifurcation region of molars (5).

In present case report the pulp vitality tests showed the non-vital nature of the tooth, was a pivoting finding suggesting the primary endodontic involvement. The presence of deep periodontal pocket, sinus tract and grade II mobility confirmed the secondary periodontal involvement. Generally, in a case of combined endo-perio lesion, an adequate endodontic therapy would result in healing of the endodontic component, and the prognosis would finally depend on the efficacy of periodontal repair/regeneration initiated by either of the treatment procedures.

Placement of calcium hydroxide as intracanal medicaments has found to be very effective in the healing of endo-perio lesions. Calcium hydroxide works in many ways (6); chemically it damages the microbial cytoplasmic membrane by the direct action of hydroxyl ions, suppresses enzyme activity, disrupts the cellular metabolism and inhibits deoxyribonucleic acid (DNA) replication by splitting DNA. Physically it acts as a physical barrier that fills the space within the canal and prevents the ingress of bacteria into the root canal system. It also kills the remaining micro-organisms by withholding substrates for growth and limiting space for multiplication. Biologically it encourages the periapical hard tissue healing around teeth with infected canals inhibits root resorption and stimulates periapical healing after trauma (7, 8, 9, 10).

The results of this case report suggests that an adequate endodontic therapy results in healing of the endodontic component, and scaling with deep root planning favours rapid periodontal repair.

Conclusion

The healing of an endodontic lesion is highly predictable, but the repair or regeneration of periodontal tissues is questionable if associated with it. Endodontic therapy mostly should precede periodontal pocket elimination procedures in the case of a primary endodontic and secondary periodontal involvement; however, endodontic therapy would result only in resolution of the endodontic component of involvement and would have a little effect on the periodontal lesion. Therefore a thorough diagnostic examination usually will indicate the primary aetiology and, thereby, direct the proper course of treatment plan as presented in this case.

References


