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Case Report

Treatment Approach to Endo-Perio Lesion: An Enigma to Dentist– Report of Two Cases

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Abstract
Endo-perio lesions primarily occur by way of the intimate anatomic and vascular connections between the pulp and the periodontium. Endodontic-periodontal combined lesion is a clinical dilemma because making a differential diagnosis and deciding a prognosis are difficult. An untreated primary endodontic lesion may become secondarily involved with periodontal breakdown, which clinically present unusual signs and symptoms. This may delay the diagnosis and hence the correct treatment. This case report describes diagnosis and treatment protocol for an endo-perio lesion of primary endodontic with secondary periodontal involvement.

Keywords: *Endo-Perio lesion, Endodontic treatment, Bone graft.*

Introduction

Pulp and periodontium have embryonic, anatomic and functional interrelationship. The pulp originates from the dental papilla and the periodontal ligament from the dental follicle and they are separated by Hertwig's epithelial root sheath.[1]

Pulpal and periodontal problems are responsible for more than half of the tooth mortality[2]. Simring and Golberg first described their relationship in 1964[3]. Since then, the term "endo-perio lesion" has been used to describe this type of lesions due to same inflammatory products found in both periodontal and pulpal tissues.

The vast majority of pulpal and periodontal diseases are caused by bacterial infection. Cross-infection between the root canal and the periodontal ligament can occur via the anatomical (apical foramen, lateral and accessory canals, dentinal tubules and palato-gingival grooves) and non-physiological pathways (iatrogenic root canal perforations and vertical root fractures).[4] These pathways determine the spread of infection. Periodontal disease causes destruction of bone in a coronal-to-apical direction while direction of the endodontic lesions is from apex to coronal. When the pulp is infected, it elicits an inflammatory response of periodontal ligament. However, the

effect of periodontal inflammation on the pulpal tissue remains controversial.[5]Clinically, the pulp is not affected by periodontal disease until accessory canals are exposed to the oral environment or microvasculature of the apical foramen is damaged.[6]

Simon et al. classified the endo-perio lesion as primary endodontic diseases, primary periodontal diseases and combined disease including primary endodontic disease with secondary periodontal involvement, primary periodontal disease with secondary endodontic involvement and true combined disease.[7] This classification has been used and given very valuable guidance to make sound clinical decisions.

The main factors to take into account for treatment decision-making are pulp vitality and type and extent of periodontal defect. 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.

This case report describes diagnosis and treatment protocol for an endo-perio lesion of primary endodontic with secondary periodontal involvement.

Case Reports

Case I

A 35 years old female patient reported to the department of conservative dentistry & endodontics, Narsinhbhai Patel Dental College, Visnagar with the complaint of continuous dull ache pain and pus discharge in relation to the lower left back tooth region since 15 days.

Medical history & dental history are not contributory. On intraoral examination, grossly decayed mandibular right first molar was found which was tender on percussion (fig 1b). Tooth was nonvital on pulp testing and revealed grade I mobility. On probing the area there was 8 mm deep periodontal pocket bucally and lingually. Sinus tract formation and pus discharge was evident in relation with mandibular right first molar.

Radiograghic examination revealed radiolucency involving with enamel, dentin and pulp as well as large periapical lesion and bone loss involving furcation area of mandibular right first molar. (fig 1a)

From above mentioned finding we arrive to diagnose it is as an endo-perio lesion of primary endodontic with secondary periodontal involvement. Treatment plan was decided to opt for endodontic approach for treatment followed by periodontal intervention if necessary and prosthetic rehabilitation.

Initially endodontic treatment was taken up first. Under local anaesthesia acess opening of mandibular right first molar was done. Upon opening drainage of exudate from canals was evident. Root canals were negotiated and cleaning and shaping of canals were completed using 5.25% sodium hypochloride and normal saline as root canal irrigants. Following this calcium hydroxide was placed inside the canals as an intra-canal medicament and acess cavity was restored with temporary restoration and patient was recalled after 2 weeks.

However patient was revisited at an interval of 3 months. So condition was reassessed, here problem was amount of sound tooth structure available for prosthetic rehabilitation was less though decided to take another chance.(fig 2) At same appointment cleaning and shaping as well as obturation was carried out.(fig 3)

After 24 hours post space preparation was done and placement of metal post was done. Core build up was done with composite resin.(fig 4&5) Prosthetic rehabilitation was done after 5 days with full cast crown i.r.t 46. Patient was put on follow up.

6 month post treatment radiograph revealed progressive healing of periapical lesion.(fig 6) Clinically there was no swelling as well as normal probing depth of 2 mm was achieved and patient was completely asymptomatic.

14 month follow up radiograph show complete healing of lesion and bone formation in furcation area of mandibular right first molar.(fig 7&8)

Fig 1a:Pre-operative Radiograph

Fig 1b:Pre-operative Photograph

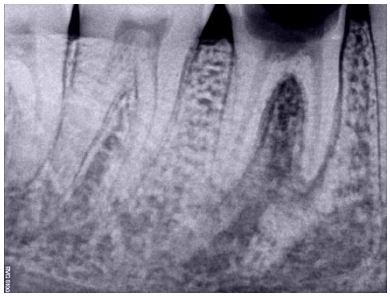

Fig 2: 3 month interval visit IOPA

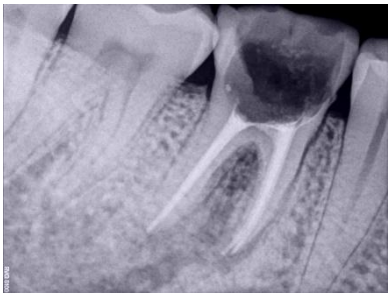

Fig 3: Obturation

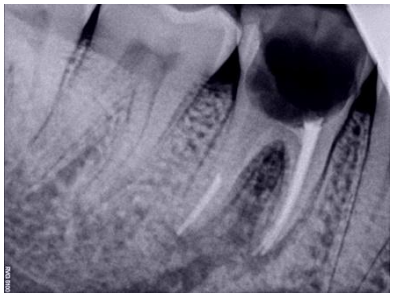

Fig 4:Post space preparation

Fig 5: Post placement & core build up

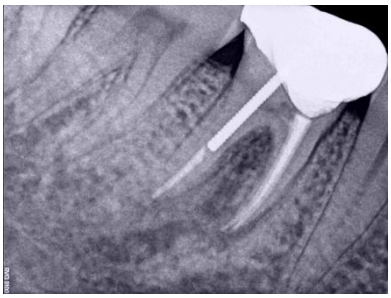

Fig 6: 6 month follow up radiograph

Fig 7: 14 month follow up radiograph

Fig 8: 14 month follow up photograph

Case II

A 28 years old male patient reported to the department of conservative dentistry & endodontics, Narsinhbhai Patel Dental College, Visnagar with the complaint of pain and pus discharge in relation to the lower left back tooth region since 10 days.

Medical history & dental history are not contributory. On intraoral examination, there was deep dental caries in association with 36, which was tender on both horizontal and vertical percussion .Tooth was non-vital on pulp testing and revealed grade I mobility. On probing the area there was 8 mm deep periodontal pocket around mesial root of tooth. Probing with nabers probe revealed grade III furcation defect as per Glickman's Classification of furcation involvement.

Radiographic examination revealed radiolucency involving with enamel, dentin and pulp. Severe vertical bone loss was evident surrounding the mesial root and involving the furcation area. The bony support of distal root was completely intact. (fig 1)

From above mentioned finding we arrive to diagnose it is as an endo-perio lesion of primary endodontic with secondary periodontal involve-

ment. Patient was explained regarding various treatment plan and decided to opt a multidisciplinary approach to salvage the tooth.

Initially Endodontic treatment was taken up first i.r.t. 36(fig 2&3) and the patient was followed up for three months. At the end of third month, radiograph was taken with 36 which showed that the furcation involvement still prevailed. On clinical examination; it was observed that there was no change in the periodontal measurements. (fig 4) Therefore, periodontal regenerative surgery was planned for treatment of furcation defect. After taking care of asepsis and sterilization the surgery was planned. The area selected for surgery was anesthetized using lignocaine with adrenaline 1:80,000. First crevicular incision was placed & full thickness flap was elevated buccally & lingually.(fig 5) After reflection, thorough degranulation and debridement was done of defect area using Gracey's curette # 13 and 14. After complete degranulation it was seen as an intrabony defect of vertical dimension of 8 mm. After root conditioning with tetracycline hydrochloride solution, adequate isolation of area was done with proper bleeding control and bone graft material (sterile hydroxyapatite and β tricalcium phosphate granules) (BioGraft-HA® NANO) was carried to the area and placed in increments with proper condensation (fig 6) The flap was secured with suture & periodontal dressing was given(fig 7a & 7b), which was removed after seven days(fig 8). After 3 weeks of periodontal surgery full coverage crown was given i.r.t. 36. At 6 month follow up, probing depth of 2 mm was achieved and bone generation in furcation area can be noticed.(fig 9) 1 year post treatment radiograph revealed complete healing of lesion, bone was formed in furcation area.(fig 10) Clinically there was no swelling and patient was completely asymptomatic.

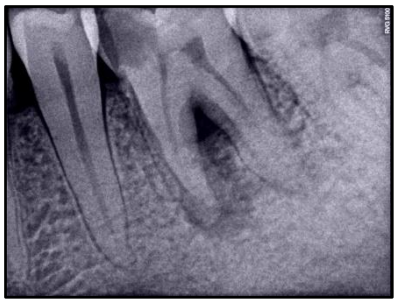

Fig 1:Pre-operative Radiograph

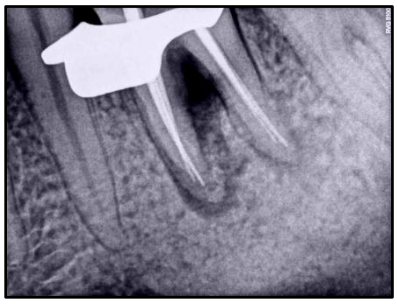

Fig 2:Master cone

Fig 3:Obturation

Fig 4:Clinical photo showing periodontal measurment

Fig 5: Incision

Fig 6: Bone graft placement

Fig 7a: Suture

Fig 7b: Periopack

Fig 8: 1 week after perio surgery

Fig 9: 6 month follow up radiograph

Fig 10: 12 month follow up radiograph

Discussion

The Endo-perio lesions present challenges to clinicians as far as diagnosis and prognosis of involved teeth are concerned. Correct dignosis is essential prerequestie to determine treatment and long term prognosis.

The infected root canal can cause a chronic inflammatory reaction which extends the gingival sulcus and drains through sinus tracts. If the rest of dentition is periodontally healthy and any root cracks and fracture has been ruled out, healing of periodontal tissue can be expected after endodontic treatment as it observed in case 1. So, furthur treatment requirement should always considered followed by an observation period of at least 3 months.[8]

When the aetiology is primarily endodontic, calcium hydroxide can be used as an intracanal medicament. Because of its bactericidal, anti-inflammatory and proteolytic properties, it inhibits resorption and favors repair. It is especially effective in endodontic lesions with extensive periapical pathology and pseudo pockets, because of its temporary obturating action which would inhibit periodontal contamination of the instrumented canals via patent channels of communication. This regimen usually will resolve the pseudo pocket within a few weeks.[9]

However, lesions show little or no improvement, periodontal intervention become necessary as seen in case 2.

Hydroxyapatite crystals and β-tricalcium phosphate act as scaphold on which osteoblasts act, to form the bone and preserves the space for regeneration. It took one month for epithelial attachment to establish & complete bone formation will occur at the end of 6th month after periodontal surgery.[10]

The ideal interval between endodontic treatment and periodontal surgery has also been challenged by controversial findings. It was reported that endodontic treatment performed 2.5 months before periodontal surgery not to impair periodontal healing.[11] Miranda et al suggest that endodontic treatment performed 6 months before surgical debridement of furcation of mandibular molars did not impair clinical parameters of periodontal healing.[12] In present case 2, root canal

was performed 3 months before periodontal surgery showed no disruptive effect on complete healing of furcation lesion of mandibular molar. This result should be confirmed by future clinical studies.

Treatment outcomes will be more predictible if clinician has more through knowledge about diagnosis, treatment sequence and intervals. Thereby, immediate and true management of endo-perio lesion can impede the loss of natural tooth and delay more complex treatment.

Conclusion

Teeth will last for life, unless they are affected by oral diseases or service interventions. Tooth longevity is largely dependent on the health status of the periodontium, the pulp or periapical region and the extent of reconstructions. Dentist encounters number of cases of teeth with endo-perio lesion. With correct diagnosis and treatment plan such teeth can be saved with long term good prognosis.

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