**DECISION MAKING AND COMPREHENSIVE TREATMENT PLANNING IN ENDODONTIC-PERIODONTAL LESION: A CASE REPORT**

ABSTRACT

Endo-perio lesion is a clinical dilemma because making a differential diagnosis and deciding a prognosis is difficult. It’s been a subject of speculation, confusion and controversy for many years. Pulpal and periodontal problems are responsible for more than 50% of tooth mortality today. A symptomatic tooth may have pain of periodontal and/or pulpal origin. It is very essential to make a correct diagnosis so that appropriate treatment can be provided. In some cases, pulpal pathology may cause periodontal involvement, in others periodontal pathology may create pulpal pathology. This case report evaluates the efficacy of perioglass as a regenerative material in the management of bony defect associated with endo-perio lesion in left mandibular first molar.

Keywords: endo-perio, furcation, guided tissue regeneration, perio-glass.

INTRODUCTION

The periodontium and the pulp are closely related, they have embryonic, anatomic and functional inter-relationships. In 1919, Turner and Drew in their study revealed the effect of periodontal disease on pulp1. The relationship between periodontal disease and pulp was first described by Simzing and Goldberg in 1964, since then the term endo-perio has become an integral part of the dental vocabulary2. Unfortunately, this term has been used indiscriminately to categorise disease of either periodontal or endodontic etiology, with or without secondary involvement of the other. It conveniently provides a blanket diagnosis but could be misleading for any such lesion, regardless of its primary etiology3. Periodontal and pulpal problems are estimated to cause 50% of tooth mortality4. Though these lesions are encountered occasionally but these may pose difficulty to the clinician in diagnosis and complicate the treatment5.

Furcation involvement presents one of the major challenges in endodontic therapy with periodontal involvement. Although the role of pulpal pathology in the etiology of furcation involvement is still unclear, the high incidence of molar teeth with accessory canals supports such an association3.

Various treatment modalities have been proposed for the treatment of furcation involvement alone including open flap debridement, bio-modification of root surface, and various regenerative procedures including GTR and bone grafts. Bone grafts having a property of osteogenesis , osteoinduction and osteoconduction have been used in the past6.

This case report attempts to utilize perioglass with the property of osteoconduction and osteostimulation in the treatment of bony defect with endo-perio lesion.

The relationship between pulpal and periodontal disease can be traced to embryological development, since the pulp and the periodontium are derived from a common mesodermal source. At the stage of tooth development, the developing tooth bud pinches off a portion of mesoderm that becomes pulp, while the remaining mesoderm develops into the periodontium. Ectomesenchymal cells proliferate to form the dental papilla and follicle, which are the precursors of the periodontium and the pulp, respectively. This embryonic development may give rise to an anatomical connection between these two vital structures throughout the life of a tooth. Three main pathways have been implicated in the development of perio-endo lesion, namely7:

1. Dentinal tubules
2. Lateral accessory canals
3. Apical foramen

Other pathways such as root perforation and palatogingival groove have also been associated with endo-perio lesions7,8,9,10,11.

Microbiology :

Bacteria: *Actiobacillus actionomycetemcomitans, bacteroides forsythus, Ekinella corrodens, Fusobacterium nucleatum , Porphyromonas gingivalis, Prevotella intermedia and Treponema denticola* are present in both endodontic sample as well as in teeth with chronic apical periodontitis and chronic adult periodontitis. Fungi: various fungal species especially *candida albicans* are prevalent both in endodontic infections as well as subgingivally in many cases of adult periodontitis. Viruses: recent data suggests that number of common type of viruses such as Cytomegalo virus, Epstein – bar virus, herpes virus may be involved in pathogenesis of periodontal and endodontic disease ranging from an increase in periodontal pathogens in periodontal pockets to involvement in pulpal and periapical pathologies12,13.

Classification of endo-perio lesions:

1. Based on possible pathologic relationships (Guldener and Langeland 1982)14
2. Endodontic-periodontal lesions.
3. Periodontal-endodontic lesions.
4. Combined lesions.
5. Based on etiology, diagnosis, prognosis and treatment (Simon’s classification 1972)15
6. Primary endodontic lesion.
7. Primary periodontal lesion.
8. Primary endodontic lesion with secondary periodontal involvement.
9. Primary periodontal lesion with secondary endodontic involvement.
10. True combined lesions.(Article 1 ref 5)
11. Based on therapy (Grossman’s classification)16
12. Teeth that require endodontic therapy alone.
13. Teeth that require periodontal therapy alone.
14. Teeth that require endodontic as well as periodontal therapy.
15. Based on endodontic therapy (Rateitschak 1989)17
16. Type I
17. Type II
18. Type III

**CASE REPORT**

A 52 year old patient reported to the department of periodontics with a complaint of pain in the left lower back tooth region associated with pus discharge since one month. On intraoral examination, a sinus was found to be present w.r.t 36. IOPA showed bone loss w.r.t distal root of 36 extending upto apical one third and in the furcation area (Fig. 1).Tooth was grade II mobile and tender on percussion. The probing pocket depth was found to be 9 mm. The patient was then referred to the department of conservative dentistry to check for tooth vitality. Electric vitality test confirmed that the tooth was non vital.

 Taking into consideration that the tooth was non-vital with a prevailing sinus tract, grade $ II$ furcation defect and with bone loss around apical region of the distal root of 36, endodontic treatment was taken up first and the patient was followed up for 3 months. At the end of 3 months, IOPA was taken w.r.t 36, which showed that the furcation defect and bone loss around distal root of 36 still prevailed (Fig.2). The draining sinus was still present. Also, on clinical examination, it was observed that there was no change in the soft tissue measurements. Therefore, periodontal regenerative surgery using perioglass was planned.

**SURGICAL PROCEDURE**

 After taking care of asepsis and sterilization, the surgery was planned. The area was anesthetized using xylocaine with adrenaline 1: 200000. A full thickness flap was raised following crevicular incision till the base of the defect. After reflection, thorough degranulation and debridement was done at the defect area which was a three walled defect. Also, thorough scaling and root planing was carried out on the exposed root surface area of the defect. Perioglass as a graft material was placed and stabilized with absorbable collagen membrane (Periocol-CG). Primary soft tissue closure of the flap was done with non-absorbable black silk (3-0) suture using figure of eight technique.

 Post-operative instructions were given to the patient. The patient was advised proper plaque control and was prescribed 0.12% chlorhexidine mouthwash for rinsing twice daily. The sutures were removed ten days after the surgery. The patient was put on regular recall at 1, 3, 6, 9 months. The treatment resulted in substantial amount of bone fill in the distal root and furcation area. The probing depth was reduced by 6 mm. Post-operative radiograph (9 month and 1 year: Fig.3 and Fig.4 respectively) showed bone fill in the defect area and furcation region.

DISCUSSION

Endodontic-Periodontal lesion is a true challenge. Its management requires thorough understanding of wound healing process involving both endodontic and periodontal complex. When a clinician cannot make a definitive diagnosis, it may be prudent to initiate either of the

treatment modalities and hope for repair. However, this could be overcome by proper history taking, thorough examination, radiographic evaluation, pulp vitality testing, pocket probing, fistula tracking and sequential treatment planning3,18.

When the etiology is purely endodontic, calcium hydroxide because of its bactericidal, anti-inflammatory and proteolytic properties, inhibits resorption, favours repair and can be used as an intracanal medicament. Because of its temporary obturating action which would inhibit periodontal contamination of the instrumented canals via patent channels of communication, it is especially effective in endodontic lesions with extensive periapical pathology and pseudopockets. This regimen usually resolves the pseudo pocket within a few weeks. However, lesions which are not true combined lesions, no or little improvement would be seen with the periodontal perspective after endodontic treatment, leaving a very poor and often hopeless prognosis. Successful periodontal treatment of such lesions has been possible now with the advent of new regenerative materials.

In this case report, the pulp vitality test which showed the non-vital nature of the tooth was a pivoting finding suggesting primary endodontic and 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 procedures3.

In this, case following endodontic treatment, the sinus prevailed and the lesion didn’t subside completely as seen in radiograph done at 3 months. Also, the clinical parameters didn’t improve. Therefore, periodontal regenerative surgery was done with perioglass as regenerative material and absorbable collagen as a barrier membrane.

Clinical studies with bioactive glass particulate have been gaining momentum in recent scenario. Bioactive glass shows both osteoconductive and osteostimulatory effects. The pore size (90-710um) allows optimal space for vascularization. It enhances bone formation by ionic dissolution of the ceramic particles such that the silica gel layer forms over the particles on contact with body fluids.

Over this silica gel layer, a calcium phosphate layer forms, which is quickly converted into a hydroxycarbonate apatite layer. This apatite layer has been shown to be identical to bone mineral and to provide the surface for osteoblast cell attachment and bone deposition3.

This case report suggests that bioactive glass (Perioglass) resulted in significant amount of bone fill as seen on radiograph.

CONCLUSION

This case report demonstrated that with the stringent case selection criteria, multiple regenerative procedures could successfully treat endo-perio lesions. The treatment strategies and the clinical outcome depend on the extent of the periodontal disease and assessment of the therapeutic prognosis, with the intended regenerative procedure, presence or absence of periapical radiolucency, tooth mobility, properly performed root canal treatment, and appropriate healing time. Therefore, within the limits of this study it may be concluded that bioactive glass is effective as a bone graft substitute in treatment of periodontal component of the endodontic lesion.

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