

Endo-perio lesion- A diagnostic quandary

Shyama Haridas^{1,*}, Harish Kumar², Santhosh VC³, Sameera G. Nath⁴, Arya Sreedhar⁵

^{1,5}PG Student, ²Professor & HOD, ³Professor, ⁴Reader, Dept. of Periodontology, KMCT Dental College, Kozhikode, Kerala

***Corresponding Author:**

Email: haridasshyama@gmail.com

Abstract

The pulp and periodontium originate from ectomesenchyme. They are embryonically, anatomically and functionally inter-related. The concurrent existence of pulpal inflammation and periodontal disease are clinical dilemma as it can complicate diagnosis and treatment planning. This case report evaluates the efficacy of decalcified freeze-dried bone allograft (DFDBA) along with bio-resorbable barrier membrane in the management of right maxillary central incisor. A patient aged 33 yrs reported to our department with endo-perio lesion in right maxillary central incisor. It was treated with decalcified freeze-dried bone allograft (OSSEOGRAFT) along with bio-resorbable barrier membrane (PERIOL). 6 months after the procedure, there was improvement in clinical parameters.

Keywords: DFDBA, GTR membrane, Endo-perio lesion

Introduction

Dental pulp and periodontal tissues are ectomesenchymal in origin. The pulp originates from dental papilla and periodontal ligament originates from dental follicle. They are separated by Hertwig's epithelial root sheath (HERS). In 1964, Simring and Goldberg first described the relation between diseases of pulp and periodontium.⁽¹⁾ Since then, the term "endo-perio" lesion has been used to illustrate the lesions with varying degree of inflammation in both pulpal and periodontal tissues.

Endo-perio lesion presents challenges to the clinician with respect to diagnosis and prognosis of the involved teeth. Although there are many factors that lead to the development and progression of endodontic and periodontal diseases, the most important cause is bacterial infections with complex microbial flora. The similarities of the microbial flora of the endodontic and periodontal lesions have been reported by many authors.^(2,3) If lesion in one of these tissues is left untreated, it can lead to signs and symptoms of disease within the other tissue.^(4,6)

Classification

Simon et al. classified endo-perio lesion based on primary source of infection. It is the most accepted and commonly used classification.⁽⁷⁾

- Primary endodontic lesion
- Primary periodontal lesion
- Primary endodontic lesion with secondary periodontal involvement
- Primary periodontal lesion with secondary endodontic involvement
- True combined lesion

Connecting paths between endodontium and periodontium: The endodontium and periodontium develop from a common ectomesenchymal origin which results in numerous communication channels, which

may lead to the spread of pathological disorders. The common possible pathways for spread of bacteria and their products are: Anatomical and Non-physiological.⁽⁸⁾

Anatomic pathways: The primary connection between the pulp and periodontium are apical foramina. In addition, there are numerous lateral and accessory canals that connect the main root canal system and the periodontium. Dentinal tubules are the third most common anatomic route for spread of infection.⁽⁸⁾

Non-physiological pathways: Iatrogenic root canal perforations and vertical root fractures are main cause. They are produced by powered rotary instruments during access opening or tooth preparation for post placement. It can also be caused by improper manipulation of endodontic instruments. They are critical complications of dental treatment and have poor prognosis.⁽⁹⁾

Vertical root fractures are caused by trauma to the tooth. It can occur in vital as well as non-vital teeth. In vital teeth it can be an extension of coronal fractures in the "cracked tooth syndrome" or it can occur exclusively on root surfaces.⁽¹⁰⁾

Case Report

A healthy female patient aged 33 years reported to the OPD, Dept. of Periodontology, KMCT Dental College, with the chief complaint of dull pain and mobility in relation to upper right front tooth from past 3 months. The pain was throbbing in nature. It was intermittent and aggravated on mastication. Patient gave a history of trauma to her upper front tooth following which it was endodontically treated 1 year ago. There was no relevant medical history.

On intra-oral examination, a sinus opening with suppuration was present in relation to discoloured 11. A probing pocket depth of 9mm and gingival recession of 3mm was present. Grade I mobility was also present. It

was slightly rotated and supra-erupted. An IOPA radiograph was taken to assess the periapical condition and to rule out any inadequacy of the endodontic treatment. The IOPA radiograph revealed widening of periodontal ligament space and radiolucency in the lateral aspect of the root. The obturation was satisfactory.

A diagnosis of a combined endo-perio lesion was made because of the concomitant presence of both lesions. Since the obturation was satisfactory, periodontal regenerative surgery was planned in relation to 11. After administering Lignocaine hydrochloride (1:1, 00,000 dilution), crevicular incisions were placed using a no. 11 BP blade in relation to 12, 11, 21 and 22. Full thickness mucoperiosteal flap was raised. After reflection thorough degranulation, debridement, scaling and root planning was carried out. In apical-third of the labial aspect of the tooth, a perforation was present exposing the guttapercha points. The exposed portion was sealed with Glass ionomer cement (GC FUJI). DFDBA (OSSEOGRAFT) was emptied into sterile dappen dish and increments of the graft materials were added, to the defect followed by placement of bioresorbable collagen membrane (PERIOCOL) to prevent epithelial migration into the defect. Primary soft tissue closure was achieved with non-resorbable black silk (3-0) suture using interrupted suturing technique. Care was taken to achieve tension-free primary closure of the flap during suturing. Silk sutures were used because of their outstanding handling properties and knot tying characteristics. Periodontal pack (COE-PAK) was placed. Antibiotics and analgesics were prescribed for 5 days. Post-operative instructions were given. Patient was advised to avoid chewing in the area of surgery for 2 weeks and not to brush or manipulate the area for 10 days. Medications were prescribed: 500 mg of Amoxicillin thrice a day for 5 days and a combination of Mefenamic acid with Paracetamol for 3 days was prescribed. After 7 to 10 days, the dressing, sutures, any plaque present were removed. Recall appointments were scheduled at 1, 3 and 6 months after the surgery for soft tissue evaluation, plaque control, radiographic evaluation and recording clinical variables. There was significant improvement in periodontal parameters and bone fill after 6 months and 9 months.



a



b

Fig. 1 a & b: Pre-operative



Fig. 2: Flap reflection



Fig. 3: Debridement and sealing perforation with GIC



a



b

Fig. 4 a & b: Placement of bone graft (DFDBA) and GTR membrane



a



b

Fig. 5 a & b: Sutures placed and periodontal pack given



Fig. 6: 10 days post-operative



Fig. 7: 6 months post-operative

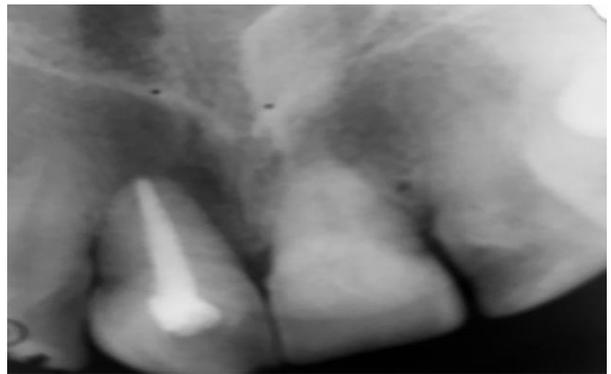


Fig. 8 a & b: Radiographic evaluation-Pre-operative 6 months post-operative

Discussion

One of the most common challenges in today's clinical practice is to diagnose and treat endo-perio lesion. The simultaneous existence of both lesions can complicate treatment planning.⁽¹⁾ This is particularly true for patients with advanced pulpitis, periodontitis and tooth loss. These diseases are studied as distinct entities and such primary disease may mimic the clinical characteristics of other diseases.⁽²⁾ A careful case history and use of proper diagnostic aids are required to identify and accurately assess the contribution of each lesion to patient's problem and determine the sequence of treatment that to produce optimal results.⁽³⁾ A variety of grafting materials like

autografts, allografts, xenografts and alloplasts has been used for periodontal regeneration.^(14,15)

DFDBA was used as it is less immunogenic and has osteo-conductive and osteo-inductive properties. Urist *et al.* showed through numerous animal experiments that DFDBA could stimulate the formation of new bone by osteoinduction.⁽¹⁶⁾ Schallhorn and McClain in 1988,⁽¹⁷⁾ reported when a combination therapy of barrier membrane and DFDBA was used followed by root conditioning with citric acid improved clinical results in intrabony defects and degree II furcations was observed. Guillemin *et al.* in 1993⁽¹⁸⁾ compared the effect of a combination of barrier materials and DFDBA with DFDBA alone in intrabony defects showed significant gain in clinical attachment and bone fill after six months, but no significant differences was found between the two treatments. Anderreg *et al.* in 1991⁽¹⁹⁾ compared the effect of combination of GTR and DFDBA with GTR treatment alone and found that there was significant improvement in horizontal probing attachment level in mandibular degree II furcation treated with combination of GTR and DFDBA. Lekovic *et al.* in 1990⁽²⁰⁾ conducted similar study and observed that the combination therapy resulted in greater extent of furcation fill, indicating that the use of bone graft in combination with bioresorbable barrier membrane is beneficial for the treatment of mandibular degree II furcation defect.

Conclusion

Diagnosis of teeth with combined endo-perio lesion is difficult to establish and hence they require proper history and use of various diagnostic aids to obtain accurate diagnosis. Lesions with combined causes will require both endodontic & periodontal therapy. Besides this, regenerative and resective techniques offer alternative approaches for treatment. The result of this case report suggests that endo-perio lesion was effectively managed with decalcified freeze dried bone allograft (DFDBA) and bioresorbable barrier membrane. It resulted in significant bone fill and improvement in periodontal parameters.

References

1. Simring M, Goldberg M. The pulpal pocket: retrograde periodontitis. *J Periodontol.* 1964;35:22-48.
2. Kurihara H, Kobayashi Y, Francisco LA, Isoshima O, Nagai A, Murayama Y.A microbiological and immunological study of endodontic-periodontic lesions. *J Endod* 1995;21:617-621.
3. Kobayashi T, Hayashi A, Yoshikawa R, Okuda A, Hara K. The microbial flora from root canals and periodontal pockets of non-vital teeth with advanced periodontitis. *Int. Endod J* 1990;23:100-106.
4. Langeland K, Rodrigues H, Dowden W. Periodontal disease, bacteria and pulpal histopathology. *Oral Surg Oral Med Oral Pathol*;37:257-270.
5. Kerekes K, Olsen I. Similarities in the microfloras of root canals and deep periodontal pockets. *Endod Dent Traumatol* 1990;6:1-5.
6. PV Abbott, J Castro Salgado. Strategies for the endodontic management of concurrent endodontic and periodontal diseases. *Australian Dental Journal*; 54:(1 Suppl): S70-S85.
7. Simon HJ, Glick DH, Frank AL. The relationship of endodontic periodontic lesions. *J Periodontol* 1972;43:202-208.
8. Zehnder M, Gold SI, Hasselgren G. Pathologic interactions in pulpal and periodontal tissues. *J Clin Periodontol*;29:663-71.
9. Petersson K, Hasselgren G, Tronstad L. Endodontic treatment of experimental root perforations in dog teeth. *Endod Dent Traumatol* 1985;1:22-8.
10. Chan CP, Lin CP, Tseng SC, Jeng JH. Vertical root fracture in endodontically versus non-endodontically treated teeth. A survey of 315 cases in Chinese patients. *Oral Surg Oral Pathol Oral Radiol Endod* 1999;87:504-7.
11. Sharanappa Kambale, Nagaveni Aspalli, Anil Munavalli, Nishant Ajaonkar, Roopa Babannavar. A Sequential Approach in Treatment of Endo-Perio Lesion- A Case Report. *Journal of Clinical and Diagnostic Research.* 2014 Aug, Vol-8(8): ZD22-ZD24.
12. Schwartz SA, Koch MA, Deas DE, Powell CA. Combined endodontic-periodontic treatment of a palatal: A case report. *J Endod.* 2006;32:573-8.
13. Peters DD, Baumgarten JC, Lorton L. Adult pulpal diagnosis: Evaluation of the positive and negative responses to cold and electric pulp tests. *J Endod.*1994;20:506-11.
14. Reynolds MA, Aichelmann-Reidy ME, and Branch-Mays GL. Regeneration of periodontal tissue: Bone replacement grafts. *Dent Clin North Am* 2010;54:55-71.
15. Ouhayoun J. Biomaterials used as bone graft substitutes. *Proceedings of the 2nd European Workshop on Periodontology.* Quintessence publishing Co.ltd. 1996:313-58.
16. Urist MR. Bone formation by auto induction. *Science* 1965;150:893.
17. Schhallhorn and McClain. Combined osseous composite grafting, root conditioning and guided tissue regeneration. *International Journal of Periodontics and Restorative Dentistry.* 1988;4:9-31.
18. Guillemin M, Mellonig J. Healing in periodontal defects treated with decalcified freeze dried bone allograft in combination with e-PTFE membranes. *Journal of Clinical Periodontology.* 1993;20:528-36.
19. Anderreg C, Mellonig J. Clinical evaluation of the use of decalcified freeze dried bone allograft with guided tissue regeneration in the treatment of molar furcation area. *Journal of Periodontology.* 1991;62:264-8.
20. Lekovic V, Carranza F. Treatment of class II furcation defects using porous hydroxylapatite in conjunction with PTFE membrane. *Journal of Periodontology.* 1990;61:575-8.