

Efficacy of Bioactive Glass Material with Guided Tissue Regeneration in the Endo-Perio Lesion

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Abstract: The pulp and periodontium have embryonic, anatomic and functional inter-relationships. The simultaneous existence of pulpal problems and inflammatory periodontal disease can complicate diagnosis and treatment planning. This case report evaluates the efficacy of Alloplast material along with bio-absorbable barrier membrane periocol in the management of fenestration associated with an endo-perio lesion in a right mandibular first molar. A 32-year-old female patient with an endo-perio lesion in the right mandibular first molar was initially treated with endodontic therapy. Patient complaint of pain in the same region after 2 weeks following the endodontic treatment, the patient was then referred to periodontics department, a 5 mm pocket was noticed in the buccal aspect of 46. Fenestration was seen with distal root of 46 after open flap debridement. Defect was treated using graft substitute material along with guided tissue regeneration (GTR) membrane. There was a significant bony fill on radiographic examination. After 6 months there was a significant gain in CAL and PD reduction.

Keywords: Alloplast, Endo-perio Lesion, Guided Tissue Regeneration, Perio-dontal Disease

I. Introduction

The pulp & the periodontium are closely related, they have embryonic, anatomic and functional similarities. Turner and Drew¹ was the one who summarized the effect of periodontal diseases on the pulp, in the 1919. The relationship between periodontal and pulpal disease was first described by Simring and Goldberg in 1964². Pulpal and periodontal problems are estimated to cause 50% of tooth mortality³. Though endoperiodontal lesions are encountered occasionally they may pose difficulty to the clinician in diagnosis and complicate the treatment⁴. The periodontal-endodontic lesions have been characterized by the association of the pulp and periodontal disease in a same tooth, which makes complex its diagnosis because a single lesion may present signs of endodontic and periodontal involvement. This suggests that one disease may be the result or cause of the other or even originated from two different and independent processes which are associated by their advancement⁵. The effect of periodontal inflammation on dental pulp is very controversial.

The Periodontium & Dent pulp have an embryonic, anatomic and functional inter-relationships.⁷ The dental pulp and periodontium are ectomesenchymal in origin. Lindhe⁸ also reported that in case of accessory canal exposure, bacterial infiltrates of the inflammatory process can reach the pulp, through apical foramina and canaliculi of the furcation area. According to Adriaens et al.⁹ bacteria coming from the periodontal pockets have the capacity of reaching the root canals towards the pulp. This suggests that the dentinal tubules may serve as a reservoir for the microorganisms and that may recolonize the treated root surface.

The most commonly used classification was given by Simon et al.⁴

1. Primary endodontic lesion
2. Primary periodontal lesion
3. Primary endodontic lesion with secondary periodontal involvement
4. Primary periodontal lesion with secondary endodontic involvement
5. True combined lesion

II. Case Report

A 32 years old patient came to the Department of Periodontics and Implantology, D.Y. Patil University school of dentistry, Navi Mumbai with the chief complaint of pain in the 46 region of the jaw since 1 month after root canal treatment has been done in the endodontic department. Patient had been referred for periodontal opinion. On clinical examination 5 mm pocket on the buccal aspect had been noticed with 46 region. RVG and necessary blood investigation was advised. Full mouth scaling and root planning was done and patient was followed up after 1 week. Again patient had experienced pain in the same region.

The area selected for surgery was anesthetized using xylocaine with adrenaline 1:80,000. A full thickness mucoperiosteal flap was raised at the buccal aspect following intracrevicular incision in the 46 region extending one adjacent tooth and vertical releasing incision at the line angle of 47 region not extending into the alveolar mucosa in the 46 region. Full thickness flap followed by split thickness flap was raised beyond the mucogingival junction. This was done to facilitate coronal positioning of the flap to achieve better regenerative procedure. After reflection, thorough degranulation and debridement was done at the fenestration. Also thorough scaling and root planning was carried out on the exposed root surface area of the defect.

Alloplast (bioactive glass) material with osteoconductive and osteostimulative properties was placed and stabilized in the fenestration area with resorbable membrane (Periocol) [fig 5, 6]. Coronally advanced flap and primary soft tissue closure was done with non-resorbable black silk (3-0) suture using interrupted suturing technique. The patient was advised proper plaque control, and was prescribed 0.12% chlorhexidine mouthwash for rinsing twice daily. The sutures were removed 10 days after surgery and the patient was advised to brush at the surgical site using an ultra-soft bristle brush for 2 weeks. The patient was also advised to continue mouthwash for another 3 weeks. The patient was put on regular recall at 1, 3, 6 months. A bioactive glass material resulted in a substantial amount of bone fill in the fenestration. After 6 months, the probing depth was found to reduce significantly. The post-op radiograph shows bone fill in the defect as shown in figure 2.

III. Discussion

The periodontal-endodontic lesions have been characterized by the involvement of the pulp and periodontal disease in the same tooth. This makes it difficult to diagnose whether the lesion is endodontically or periodontally involved. Generally, in a case of combined endo-perio lesion, only endodontic treatment would result in healing of the endodontic lesion. The prognosis may depend on the periodontal repair/regeneration initiated by either of the treatment protocol⁷. In this case, following endodontic therapy the periodontal lesion had reduced radiographically to some extent after 1 month but did not subside completely and there was no change in the clinical symptoms like pus discharge through pocket. This has confirmed a secondary periodontal involvement along with primary endodontic lesion. Recently, many studies have been publishing with bioactive glass material. The Bioactive glass have both osteoconductive and osteostimulatory effects⁹. This Pore size (90–710 μm) allows optimal space for neovascularization. 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 quickly converts into a hydroxyl carbonate apatite layer.

When the etiology is purely endodontic, calcium hydroxide can be used as the best intracanal medicament to subside the lesion. It is an excellent medicament as it is a bactericidal, anti-inflammatory and proteolytic, it inhibits resorption and it favors repair⁹⁻¹¹. Calcium hydroxide is mainly effective in endodontic lesions with extensive periapical pathology and pseudo pockets¹¹. This will help in resolving the pseudo pocket within a few days. In any conditions with both endodontic and periodontal lesion, an attempt should be made to identify the primary cause of a combined lesion but this may not always be possible. In such cases, it is not essential to determine which disease entity occurred first as the treatment will involve endodontic and then periodontal management¹¹. The results of this case report suggest that bioactive glass is effective bone filler seen radiographically and reduces pocket depth clinically¹². This was also seen from the studies by Anderegg ET al.⁸ Raja ET al.⁹ and Humagain ET al.¹⁰ used bioactive glass in the fraction defects. Therefore it can be concluded that bioactive glass is effective as a bone graft substitute in treatment of periodontal component of the endo-perio lesion.

IV. Conclusion

Endodontic-periodontal lesions present challenges to the clinician as far as diagnosis and prognosis of the involved teeth are concerned. It is a multifactorial disease entity having multiple etiologic factors such as bacteria, fungi, and viruses as well as other various contributing factors such as trauma, root resorptions, perforations and dental malformations also play an important role in the development and progression of such lesions. The endo-perio lesion is a condition characterized by the association of pulpal disease and periodontal in the same dental element. This highlights the importance of taking the complete clinical history and making the right diagnosis to ensure correct prognosis and treatment.

Reference

- [1]. Turner JH, Drew AH. (1919): Experimental injury into bacteriology of pyorrhea, Proc R Soc. Med (Odontol) 12:104.
- [2]. Simring M., Goldberg M. (1964): The pulpal pocket approach: retrograde periodontitis, J Periodontol 35:22.
- [3]. Yoneda.M, Motooka.N, Naito.T, Maeda.K, Takao.H. (2005): Resolution of furcation bone loss after non-surgical root canal treatment: application of a peptidase-detection kit for treatment of type I endoperiodontal lesion, J.Oral Sci. 47: 143-147.
- [4]. Simon JH, Glick DH, Frank AL. The relationship of endodontic- periodontic lesions. J Periodontol. 1972;43:202-8.
- [5]. Dejean KS, Reinheimer DM, Piva MR, Silva LCF, Martins Filho PRS. Disseminação de infecção odontogênica originada de um abscesso endoperiodontal – relato de caso. Academia Tiradentes de Odontologia. Revista Online de Odontologia. 2009;10:861-6.
- [6]. Seltzer S, Bender IB, Ziontz M. The interrelationship of pulp and periodontal disease. Oral Surg Oral Med Oral Pathol. 1963;16(12):1474–90.

- [7]. Mandel E, Machtou P, Torabinejad M. Clinical diagnosis and treatment of endodontic and periodontal lesions. *Quintessence Int.* 1993;24(2):135–9.
- [8]. J. Lindhe, *Tratado De Periodontia Clínica e Implantologia Oral*, Guanabara Koogan, Rio de Janeiro, Brazil, 3rd edition, 1999.
- [9]. Anderegg CR, Alexander DC, Freidman M. A bioactive glass particulate in the treatment of molar furcation invasion. *J Periodontol.* 1999;70:384–7.
- [10]. Humagain M, Nayak DG, Uppoor AS. A clinical evaluation of bioactive glass particulate in the treatment of mandibular class II furcation defects. *Braz J Oral Sci.* 2007;6:1450–6.
- [11]. Khalid S. Al-Fouzan. A New Classification of Endodontic-Periodontal Lesions *International Journal of Dentistry.* Volume 2014 (2014).
- [12]. Louis FR, Brian M, Robert G. Mosby; 2004. *Text Book Of Periodontics: Medicine, Surgery and Implants Elsevier*; p. 586.

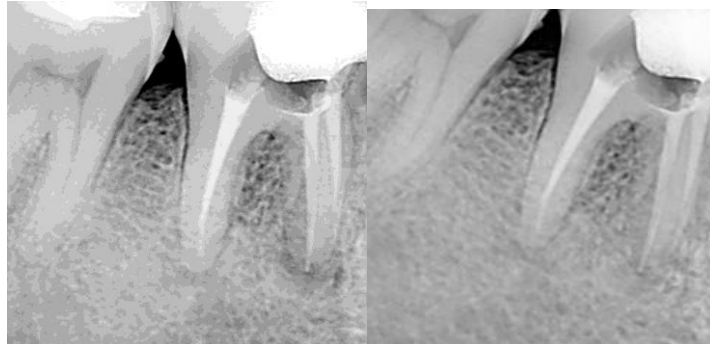


Figure 1. Preoperative RVG **Figure 2.** Postoperative 6 month RVG



Figure 3. Periodontal abscess



Figure 4. fenestration with 46



Figure 5. Bioactive glass material **Figure 6.** Periocol membrane



Figure 7. Six Months follow up