

REVIEW

Periodontal Management of Non Healing Endodontic Lesion

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ABSTRACT:

The fact that the periodontium is anatomically interrelated with the dental pulp by virtue of apical foramina and lateral canals creates pathways for exchange of noxious agents between the two tissue compartments when either or both of the tissues are diseased. Proper diagnosis of the various disorders affecting the periodontium and the pulp is important to exclude unnecessary and even detrimental treatment.

This is a clinical case report of an endodontic-periodontic lesion in relation to lower left central incisor. Root canal treatment has been done with the respected tooth six months ago, but the lesion showed no sign of healing resulting in draining sinus and increasing pocket depth. Radiographic examination revealed over-obturation of gutta-percha with peri-radicular pathology. Periodontal flap surgery was performed and the defect was filled with bone graft mixed with Platelet rich plasma (PRP) and covered by platelet rich fibrin (PRF). Patient reviewed for six months which showed uneventful healing and no recurrence of the lesion.

Key words: *Endodontic-periodontic lesion; non healing lesion; over-obturation; platelet rich plasma; platelet rich fibrin; Regenerative periodontal surgery.*

INTRODUCTION:

The relationship between pulpal and periodontal disease was first described by Simring and Goldberg in 1964. Since then the term endo-perio lesions has been used to describe lesions due to inflammatory products found in varying degrees in both pulp and periodontal tissues. The pulp and periodontium have embryonic, anatomic and functional interrelationships as they are ectomesenchymal in origin.¹

The endodontic-periodontic lesion presents challenge to the clinicians as far as diagnosis and prognosis of involved teeth are concerned. Proper diagnosis of the lesion is essential for appropriate treatment. When endodontic infection drains through the periodontal ligament, a typical narrow and deep probing site can be detected.

Classification of Endodontic-Periodontic Lesions.²

1. Primary Endodontic
2. Primary Periodontic
3. Primary Endo Secondary Periodontic
4. Primary Periodontic Secondary Endodontic
5. True Combined lesion

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In general, when primary disease of one tissue, i. e. pulp or periodontium, is present and secondary disease is just starting, always treat the primary disease.^{3, 4, 5} When secondary disease is established and chronic, both primary and secondary disease must be treated. By and large, endodontic therapy precedes periodontal therapy. The complete healing of periodontal support can be expected following successful treatment of pulpal pathology.

Regenerative periodontal surgery provides more predictable result for the regeneration of lost periodontal structures. Recently various autologous concentrate have been tried, like platelet rich plasma (PRP) and platelet rich fibrin (PRF) in combination with bone graft for the regeneration which showed better clinical result.

PRP is procured from the whole blood which is taken from the patient before the surgery and is then centrifuged. The concentration of platelet is then mixed with calcium chloride.⁶ PRP has various growth factors which enhances the healing of wound and rapid regeneration of lost supporting periodontal structure.⁷ Medical literature provides evidence that platelets contain many growth factors, including platelet derived growth factor (PDGF), insulin like growth factor (IGF) and transforming growth factor β (TGF- β).⁸

PRF was first developed in France by Choukroun et al. (PRF) is an autologous fibrin matrix used to enhance bone regeneration.⁹ PRF offers several advantages including promoting wound healing, bone growth and maturation, graft stabilization, wound sealing and hemostasis, and improving the handling properties of graft materials. PRF can also be used as a membrane. Clinical trials suggest that the combination of bone grafts and growth factors contained in PRP and PRF may be suitable to enhance bone density.

CASE REPORT:

A 32 year old male patient reported to the department of Periodontology and Implantology in

K. B. H Dental College and Hospital complaining of mobility and pus discharge from the lower right anterior region. He also complains of intermittent throbbing pain which was aggravated on biting. Patient gave a history of root canal treatment done with lower right central incisor two years ago.

Clinical examination:

Intra-oral examination revealed chronic abscess with draining sinus through attached gingiva in relation to 31 (Fig. 1). Pus was expressed though the draining sinus on digital pressure. Periodontal examination revealed pocket of 9 mm on the labial aspect of 31 which was extending beyond muco-gingival junction (Fig. 1). The respected tooth was slightly extruded and had grade I mobility.

Radiographic examination:

Revealed over-obturation of the gutta-percha in the peri-apical area and peri-radicular pathology in relation to 31 (Fig. 2). The lesion was extending from 32 to 41.

Vitality test was done with 31, 32 and 41. Negative response was with 31 and positive with 32, 41, so RCT was not done with 32, 41.

Treatment:

At the initial appointment abscess drainage was done followed by antibiotic regimen. In the next appointment through scaling and root planing was done. To eliminate mobility, splinting was done with the help of impregnated glass fiber splint material [Interling, Angelus (Brasil)].

Two weeks after completion of phase one therapy patient was appointed for the periodontal surgery. Before starting the surgery 15 ml of blood was collected from the left cubital vein of patient. Collected blood was centrifuged to prepare PRP (3A) and PRF (3B) respectively. PRF was prepared by centrifugating the blood by using a table top centrifuge for 12 min at 2700 RPM [Etek, Elektrocrafts, Bombay]. PRP was prepared as follows. At the first centrifugation step (2, 400 rpms for 10 minutes), PRP

and platelet-poor plasma (PPP) portions were separated from the red blood cell (RBC) fraction. After discarding the RBC fraction, the samples were again centrifuged (3,600 rpms for 15 minutes) to separate the PRP (0.6 ml) from PPP [Eltek, Elektrocrafts, Bombay].

Subsequently periodontal flap was reflected by using crevicular and releasing incision. Through scaling root planing and degranulation was done to visualize the anatomy of the defect. The defect was arch shape extending from the distal aspect of 32 to distal aspect of 41 (Fig. 4). The bone was present on the lingual aspect of the roots. Over-obtured gutta-percha was removed by using high speed rotating bur. Regenerative osseous surgery was performed by using bone graft which was mixed with PRP. Defect area was filled with grating material and covered by PRF membrane (Fig. 5). Flap was sutured back by using interrupted loop suture (Fig. 6). Post operative instruction and antibiotic was given to the patient.

Patient recalled after 10 days for suture removal and then reviewed every month for six months. Patient showed uneventful healing and no recurrence up to the end of six months of follow-up period (Fig. 7). Radiograph showed evidence of bone regeneration in the peri-radicular area (Fig. 8).

Discussion:

The relationship between the pulp and the periodontium has been extensively studied; however, queries regarding the diagnosis, prognosis and treatment are raised time and again. The pathways for the spread of bacteria between pulpal and periodontal tissues have been discussed with controversy.^{10,11,12} Pulpal infection can drain through the periodontal ligament space and give an appearance of periodontal destruction, termed retrograde periodontitis.

The presented case was a primary endodontic lesion with secondary involvement of periodontal tissue. The patient gave history of endodontic treatment done two years ago and pus discharge, mobility and mild throbbing pain with 31 since six

months. The treatment was done on the basis of evidence that PRP and PRF helps in the healing of periodontal tissue when used in conjunction with bone graft material.

Marx et al performed the most compelling study available on the use of PRP in combination with bone graft. The author found that the bone graft combined with PRP showed a maturity index more than twice the actual maturity.¹³ de Obarrio et al incorporated PRP into a combination technique involving bone allograft for periodontal regeneration. They observed significant gain in clinical attachment and filling of the treated defect.¹⁴

Use of PRF to improve bone regeneration is well documented.^{15,16} Joseph Choukroun from a histological study concluded that sinus floor augmentation with FDBA and PRF leads to a reduction of healing time prior to implant placement.¹⁷ The findings of Wiltfang et al. from a series of clinical trials are encouraging in that they show improved properties of PRF as compared with PRP.¹⁸

Conclusion:

This case report demonstrates nature of periodontal lesion as secondary involvement to an originally endodontic lesion involving the tooth. Treatment of combined endodontic and periodontal lesions does not differ from the treatment given when the two disorders occur separately. The part of the lesion sustained by the root canal infection can usually be expected to resolve after proper endodontic treatment. The part of the lesion caused by the plaque infection may also heal following periodontal therapy. Newer treatment strategies like use of bone graft, PRP and PRF for regeneration of lost periodontal structure show better results.

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Figure 1: Preoperative with probing pocket depth

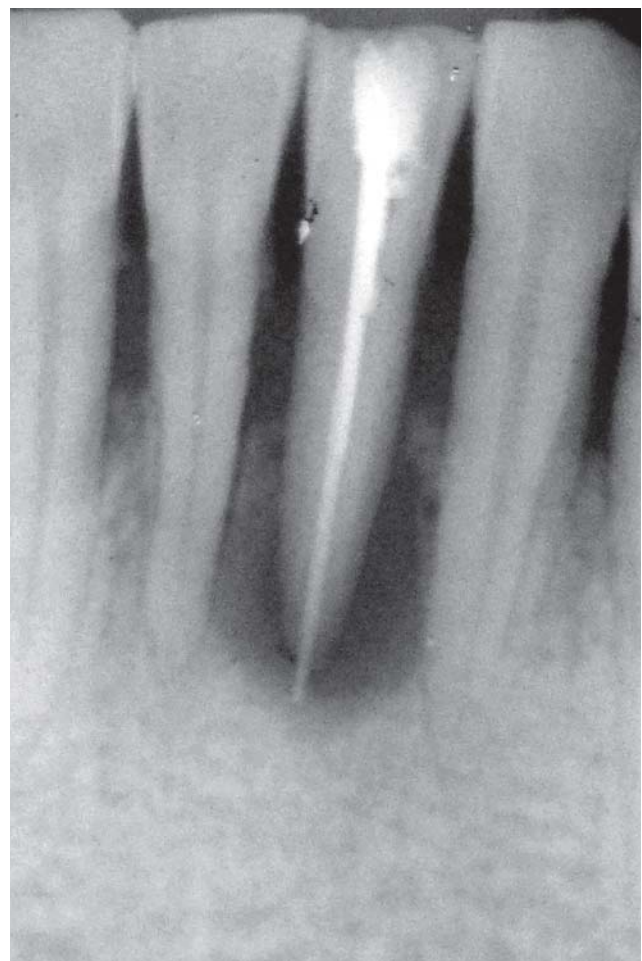


Figure 2: Preoperative radiograph showing periapical bone loss with overobturation of gutta-percha.

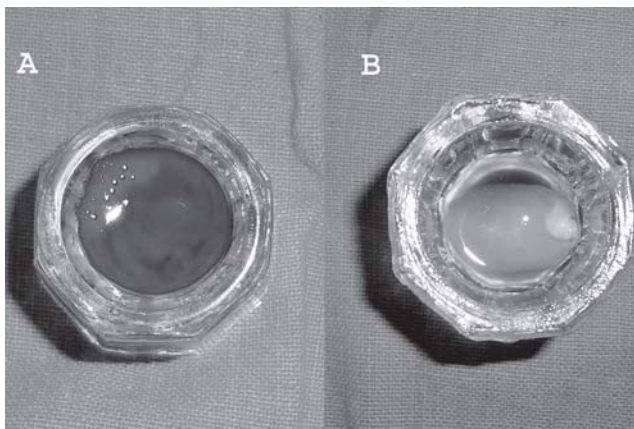


Figure 3: Prepared PRP (A) and PRF (B).



Figure 4: Flap reflection and degranulation of the defect.



Figure 5: PRP + bone graft and PRF in place.



Figure 6: Flap closed with silk suture.



Figure 7: Healing after six months.



Figure 8: Radiograph showing bone regeneration after six months.