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Conservative Approach in the Management of Periapical Granuloma and Management of Fenestration Around Upper Left Central Incisor using PRF

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Abstract

Periapical granuloma are a pathology frequently addressed to endodontic specialists. Although their therapy is still not standardized, the treatment should be as conservative as possible and by endodontic means, as they are lesions of endodontic origin. The present case report describes case of upper left lateral incisors with large periapical lesion. This case report also discuss the regeneration of periodontal tissues in fenestration defects that had developed around maxillary left central incisor, using a novel, cost effective platelet-rich fibrin clot. Breach in the continuity of the cortical plate often leads to dehiscence and fenestration alveolar defects. These alveolar defects profoundly affect the prognosis of both periodontal and endodontic treatment outcomes; therefore, they should be carefully diagnosed and managed to increase the long-term prognosis of the tooth.

Keywords: Periapical granuloma, fenestration, platelet rich fibrin

Introduction

This case report has been presented to emphasize that all non-vital teeth with periapical lesion should be first treated conservatively, and the treatment mode is to be changed to surgical therapy only when conventional treatment proves ineffective.[1] Thus surgical endodontic treatment is indicated in limited number of cases of persistent periradicular pathosis. Selection between alternative treatments should be based on assessment of individual case.[2] An innovative method of surgical removal of the periapical lesion to save teeth with periapical pathosis refractory to conventional treatment and to preserve the adjacent vital structures has been introduced.[3]

The periodontium is considered healthy when the crest of the interproximal bone is positioned within 2mm apical to CEJ.[4] Whenever there is a breach in the contour of cortical plate, anatomical defects such as a fenestration or dehiscence may result.[5] In simple words, fenestrations are described as secluded areas of denuded root where the surface is blanketed only by the periosteum and gingiva, but marginal bone is intact.[1]

PRF, a natural reservoir for growth factors, is a strong fibrin matrix useful in tissue regeneration. The case-reports detailed below discuss the use of PRF as a regenerative biomaterial for the management of alveolar defects.[1]

Case Report

A 45-year-old male, healthy, nonsmoker patient reported to department with chief complaint of food lodgement in upper front teeth since 1 month. The patient had no contributory medical condition. Clinical examination identified generalized attrition

and open pulp chambers in relation to 12, 11, 21 and 22 and food lodgement in same. Tooth responded negatively to thermal and electric pulp sensitivity tests. The periodontal consultation that included bone sounding (transgingival probing) under local anesthetic infiltration gave rise to the suspicion of a fenestration defect on the radicular surface of tooth 21. Radiographic evaluation of the maxillary anterior teeth, revealed a periapical radiolucency in relation to 12, 11 and 21 while on the other hand 22 revealed periapical unilocular radiolucency [Figure 1A]. The condition was diagnosed as asymptomatic periapical granuloma and fenestration defect .

The treatment plan consisted of RCT of 12,11,21 and 22 followed by a periapical surgery and retrograde filling of the root and PRF for regeneration of lost periodontal tissue. An informed consent was obtained from patient. Following rubber dam isolation and local anesthesia administration, access was gained into the tooth, and the canal was instrumented circumferentially. Chlorhexidine, saline and sodium hypochlorite was used as an irrigant. Nonsetting calcium hydroxide-iodoform paste (Metapex) was used as an intracanal medicament. At subsequent visit after 7 days, the patient was asymptomatic. The canals were obturated 50 number GP-cones and endomethasone-sealer. Rest of canals was laterally condensed using accessory cones, and the access cavity was sealed with GIC [Figure 1B].

The patient was scheduled for surgery, prior to which a complete hemogram was done, with all the parameters within normal limits. Prior to initiating the surgical procedure, 10ml of patient's own blood sample was taken without anticoagulant in 10ml tubes and immediately centrifuged at 3000rpm for 12min in tabletop centrifuge machine. The supernatant was removed, and PRF was isolated by collecting the upper layer after cutting below the junction between the middle and RBC layers [Figure 1E]. Local anesthesia was administered using 2%lignocaine hydrochloride with 1:80,000adrenaline. A crevicular incision was given to raise a full thickness mucoperiosteal flap from distal margin of 11 extending up to distal margin of 23 region[Figure 1C]. Complete debridement of surgical site indicated a fenestration defect in relation to 21 [Figure 1D]. As periapical granuloma was at the apex of 22, the osteotomy site was extended apically to expose the lesion and root end [Figure 1D]. The gutta-percha at root end was sheared off with a heated excavator, and root end was prepared with an inverted cone bur on a slow speed handpiece to receive MTA (ProRoot MTA, Dentsply). The hydroxyapatite graft (G-bone, modified hydroxyapatite granules) was mixed with the blood of the patient and filled in the osseous defect [Figure 1F and G]. The PRF obtained was divided into two parts one placed into the cavity onto the bone graft and another one was squeezed and was positioned as a membrane over the surgical site, and the reflected tissue was readapted and sutured [Figure 1E,H,I,J and K]. Coepak was applied on operative area. Postoperative instructions were given to patient and analgesic was prescribed for 3 days. The patient was instructed to use 0.2% of chlorhexidine mouth rinse for a week from the 2nd day after periodontal surgery. Pack and sutures were removed 7 days after the surgical procedure [Figure 1L].

Discussion

The regeneration of bone after periapical surgery depends primary wound closure, angiogenesis of vessels, source of undifferentiated mesenchymal cells, space maintenance and stability of the wound.[1] The most commonly used technique for regeneration involves the use of osseous grafts which aids in tissue or bone regeneration through a variety of mechanisms. HA has shown very good results with respect to periodontal and periapical bone regeneration. Literature review reported that a combination of HA and PRF resulted in greater pocket depth reduction, a gain in clinical attachment and better defect fill than PRF used alone.[2] Thus, HA was selected, to enhance the effects of PRF by maintaining the space for tissue regeneration and osteoconductive effects in the bony defect area.[6] A blood clot is the host's own biologic product which plays a major role in wound healing. When PRF is used along with bone grafts, it offers several advantages like promoting wound healing, bone growth and maturation, graft stabilization, wound sealing, haemostasis and improving the handling properties of graft materials.[3] The PRF used in this case report has proven to be a favourable bone regeneration material along with an interpositional material.[7]

Conclusions

It can be concluded that endodontic treatment with calcium hydroxide as intracanal medicament might

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be a viable approach for promoting periapical healing and success in root canal treatment in non-vital teeth associated with periapical lesion. However, periapical surgery may be the only alternative when the tooth with periapical lesion fails to respond to calcium hydroxide as intracanal medicament. To prevent injury to other vital anatomic structures, a novel method of surgically treating large periapical lesions has also been introduced in the present case report.

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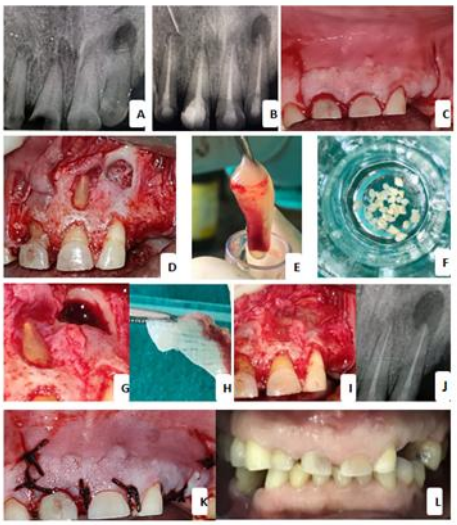

Preoperative view. (B) RCT in 12,11,21 and 22. (C) Full thickness flap reflection. (D) Alveolar defect in relation to 21 and osteotomy site was extended apically to expose the lesion and root end-22. (E) PRF obtained from patient's blood sample. (F) Bone Graft. (G) Graft and PRF filled in the defect. (H-I) PRF- membrane placed over graft-filled defect and fenestration region. (J) Postoperative view. (K) Flap readapted and sutured. (K) Suture removal after 7 days

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