Management of a large non healing periapical lesion by combined
Endodontic-Periodontic Approach: A Case Report

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Abstract:
Regeneration of lost tissues within the oral cavity seems to be the trend of dental professionals and numerous advances have been made in that direction. Unfavorable outcome following root canal treatment can be attributed to many reasons, but sometimes even a well-performed treatment can lead to non-healing of peri radicular lesions necessitating a more aggressive and invasive periapical surgery. PRF(platelet rich fibrin), a second generation platelet concentrate containing viable platelets has generated widespread attention because of its ability to provide multiple growth factors. The present case report aims to evaluate the efficacy of minced PRF along with Xenograft in the treatment of a non-healing periapical lesion. The results were evaluated based on the clinical symptoms and radiological (bone fill) findings. It is seen that PRF results in improved healing and excellent bone fill when used in conjunction with bone grafts.

Key Words: Regeneration, PRF (platelet rich fibrin), Xenograft.

Introduction
Surgical treatment of oral defects results in repair or regeneration. Regeneration is defined as the reproduction or reconstitution of a lost or injured part of the body in such a way that the architecture and function of the lost or injured tissues are completely restored. Since repair is not the ideal outcome anticipated by surgeons, newer regenerative techniques that aim at complete regeneration have been employed routinely in dentistry.

Bacterial infection of the dental pulp may lead to periapical lesions. In situations where conventional root canal therapy fails to eliminate the lesion; surgery is the last alternative. Periapical surgery includes removal of diseased soft tissue and sometimes application of different graft material to enhance new bone formation at the defective site.

In 1974, platelets regenerative potentiality was introduced, and Ross et al., were first to describe a growth factor from platelets. After activation of the platelets, which are trapped within fibrin matrix, growth factors released and stimulate the mitogenic response in the bone periosteum during normal wound healing for repair of the bone.

Platelet rich fibrin (PRF) described by Choukroun et al., allows one to obtain fibrin mesh enriched with platelets and growth factors, from an anticoagulant free blood harvest without any artificial biochemical modification. The PRF clot forms a strong natural fibrin matrix, which concentrates almost all the platelets and growth factors of the blood harvest, and shows complex architectures as a healing matrix, including mechanical properties that no other platelet concentrate can offer.

Case Report
A 23 year old female pt reported to the Department of Conservative Dentistry and Endodontics with chief complaint of recurring pain and swelling in the upper front tooth region since 1 year back. The tooth was tender on vertical percussion and IOPAR showed well obturated root canal with large periapical radiolucency. (Figure1) Based on the history and the radiograph, it was planned to perform a periapical surgery with retrograde MTA placement followed by placement of bone graft with PRF into the defect. The whole treatment plan was explained in detail to the patient and a written informed consent was taken for the same.

The PRF was prepared in accordance with the protocol developed by Choukroun et al. Just prior to surgery, 8 ml intravenous blood was collected in a 10-ml sterile tube without anticoagulant and immediately centrifuged in centrifugation machine at 3,000 revolutions per minute for 10 minutes. Blood centrifugation immediately after collection allows the
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Composition of a structured fibrin clot in the middle of the tube, just between the red corpuscles at the bottom and acellular plasma (Platelet-poor plasma) at the top. PRF results from a natural and progressive polymerization, which occurs during centrifugation. PRF was easily separated from red corpuscles base [preserving a small red blood cell (RBC) layer] using a sterile tweezers and scissors just after removal from the tube and then transferred onto a sterile dappen dish and stored in refrigerator.

Surgical procedure

After administration of local anesthesia, labial and palatal sulcular incisions were made extending from tooth # 12 to tooth # 22 with vertical releasing incisions extending beyond the mucogingival junction at the distal line angles of both these tooth. A full thickness mucoperiosteal flap was raised and upon exposure, the defect was seen which had almost eroded the labial cortical plate. The lesion was carefully enucleated. (Figure 2) Now with a No 702 tapered fissure bur, the apical end of the root was trimmed and a retrograde MTA (Mineral trioxide Aggregate) was placed. Now, the previously prepared PRF was minced, mixed with bone graft (OSSEOMOLD, ENCOLL, USA) and placed into the defect. (Figures 3 & 4) The flap was repositioned and secured with 4-0 silk sutures by giving simple interrupted sutures and subsequent placement of periodontal coe pack.

Post-operative instructions were given to the patient and suitable antibiotics, analgesics and 0.2% chlorhexidine gluconate mouthrinse was prescribed to the patient. The sutures were removed 7 days post surgery and the patient reviewed upto 1 year. Routine radiographs were obtained and the radiograph after 1 year revealed complete healing of the lesion with adequate bone fill with the patient reporting totally asymptomatic. (Figures 5 & 6)
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The present case utilized PRF along with a Xenograft for treatment of a periapical lesion along with MTA for retrograde apical seal. The main reason for the favorable outcome following PRF is the elaboration of numerous growth factors like platelet derived growth factor (PDGF), Transforming growth factor beta (TGF beta 1 & 2), Insulin like growth factor (IGF) and epidermal growth factor to name a few which help in healing probably by decreasing inflammation. Secondly it has been hypothesized that it has a natural fibrin framework and can protect growth factors from proteolysis. Thirdly, PRF increases cell attachment, proliferation, and collagen related protein expression of human osteoblasts. In this case, we employed minced PRF along with Xenograft (OSSEOMOLD) to ensure easy delivery of the graft to the site of the defect.

Conclusion
In the present case, use of PRF with Xenograft resulted in favorable outcome following surgical treatment of a non-healing periapical lesion

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References: