

Management of Localized Loss of Periodontal Support Associated with Intrabony Defect in Patient with Localized Chronic Periodontitis Using Mixture of Platelet-Rich Fibrin and Bioactive Glass

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ABSTRACT

Background: Periodontal disease is infectious, complex, multifactorial, chronic inflammatory disease of supporting periodontal tissues of oral cavity that affects the bone morphology including its height. Among different types of bony deformities vertical defects are more amenable to regenerative periodontal therapy. For this reason the present case report describes the use of regenerative procedure using bonegraft in combination with platelet rich fibrin management of localized advance osseous intrabony vertical defect.

Keywords: Bioactive glass, Bonegrafts, PRF.

INTRODUCTION

The management of periodontitis begins with proper clinical and radiographical diagnosis. The presence of boneloss in the form of intrabony defect indicates a regenerative procedure in management of periodontal disease. Many techniques are available where combinations of grafts are used. Choukroun's platelet-rich fibrin (PRF) ⁽¹⁾ potential has attracted lot of attention of various researchers not only in field of periodontology but in other branches as well.⁽²⁾ The purpose of this report is to evaluate the efficacy of combination of bioactive glass and platelet rich fibrin in management of intrabony defect.

CASE REPORT

A 35-year-old male patient reported to the Department of Periodontics with chief complaint of food lodgement, in lower right back tooth region

and bleeding gums. On examination, local factors and gingival inflammation were observed [Figure 1]. Patient showed generalized normal probing depth of 2-3 mm except in #46 tooth where distobuccal vertical probing depth of 12 mm was present [Figure 2]. The patient was otherwise systemically healthy. Intraoral periapical radiograph [Figure 3] revealed localized intrabony defect with diagnosis of localized periodontitis.

After Phase I therapy, patient was reevaluated after 3 weeks and showed healthy gingiva with normal clinical sulcus with proper oral hygiene maintenance, however the #46 tooth showed presence of deep pockets and radiographically evident intrabony defect. The management of #46 tooth was planned with regenerative procedure using bonegraft along with platelet rich protein to utilize the modern concepts

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Fig 1: Preoperative photograph showing presence of local factors and gingival inflammation.



Fig 2 : Vertical probing depth of 12 mm in distobuccal aspect of #46.



Fig 3: Intraoral periapical radiograph showing advanced localized bone loss with intrabony defect in #46.

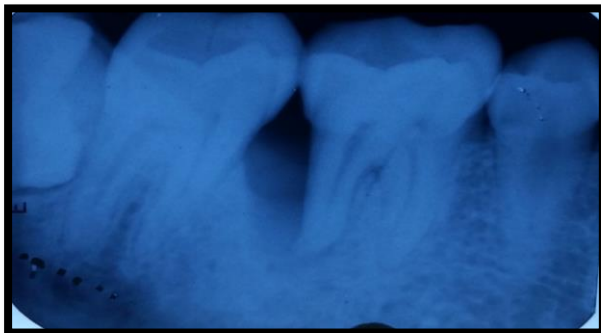


Fig 4: Flap is reflected and thorough debridement is done buccally and lingually.



Fig 5: The bioactive glass bone graft is mixed with prepared PRF.



Fig 6: The bone graft and PRF mixture is properly condensed and filled in intrabony defect.

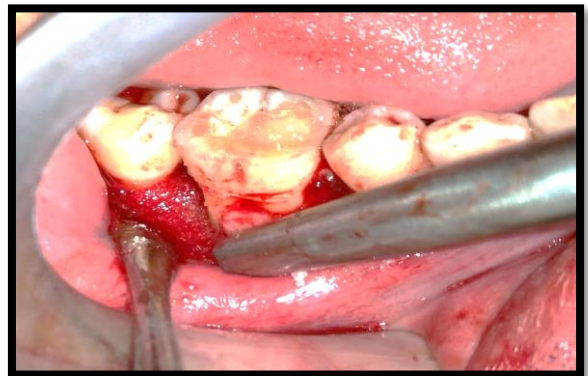
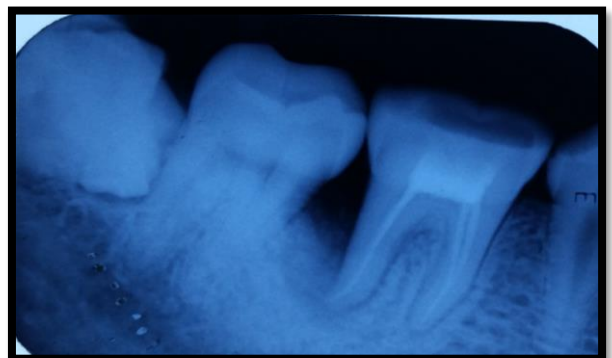


Fig 7: Post operative intraoral periapical radiograph showing bone fill after duration of 6 months.



for better benefits. Choukroun's PRF and bioactive was used and duly signed consent from the patient was taken. The patient was advised routine blood, urine investigations along with HIV, hepatitis C virus, and hepatitis viral markers were reported to

be negative. the periodontal surgery was preceded by intentional root canal treatment because of apical involvement of concerned tooth.

After local anesthesia administration both the buccal and lingual full-thickness flaps were reflected after crevicular incision with respect to #45-#47 along with vertical incision in distobuccal aspect of #45. A thorough subgingival scaling and root planing of intrabony defect associated with #46 is done [Figure 4]. After proper debridement PRF was prepared as per protocol developed by Choukroun's *et al.* [3] Ten milliliters of blood sample was taken from antecubital vein of the patient in sterile glass tube without an anticoagulant and centrifuged at 3000 rpm for 12 min. A fibrin clot was formed in the middle part of the tube whereas the upper and bottom part contained acellular plasma and red cells, respectively.

A fibrin clot formed in the middle part of the tube was obtained and mixed with bioactive glass [Figure 5]. The mixture is properly condensed on the walls of defect [Figure 6] followed by placement of collagen membrane and direct loop sutures were taken. The patient was instructed given instructions and advised oral rinse twice daily with 0.12% chlorhexidine for 2 weeks and amoxicillin 500 mg and ibuprofen 400 mg was advised thrice a day for 5 days. Surgical wound healed uneventfully, and sutures were removed 10 days postoperatively. Radiographic evaluation of #46 at 6 months showed bony regeneration [Figure 7].

DISCUSSION

Chronic periodontitis is characterized by loss of attachment due to destruction of periodontal ligament along with loss of adjacent supporting bone. The goal of management of periodontitis includes not only the cessation of periodontal disease progression, but also the regeneration of periodontal structures lost due to disease⁽⁴⁾. Bone grafting is one of the most common forms of regenerative therapy and is essential element for restoring periodontal supporting tissue⁽⁵⁾. A wide variety of bone grafting materials, including bone grafts and bone graft substitutes, have been evaluated and discussed, such as autografts, allografts, xenografts, and alloplasts (synthetic/semisynthetic materials)⁽⁶⁾.

Platelet Rich Fibrin (PRF), is an autologous biomaterial, containing leukocytes, platelets and a wide variety of important healing proteins within a dense fibrin matrix. PRF holds promise as a regenerative material as it releases high amounts of growth factors such as (TGFβ1, PDGF-AB, VEGF) and matrix glycoproteins. Thus may stimulate the proliferation of different cell types including fibroblasts, osteoblasts and keratinocytes⁽⁷⁾.

Bone grafting materials have been used to maintain the space for cell repopulation and to act as osteoinductive or osteoconductive materials for the formation of host bone.^(8,9) Bioactive glass is used widely in other clinical situations, such as periodontal lesions. Bioactive glass has been demonstrated to repair periodontal defects and to produce bone fill in the defect. On placement, the material immediately interacts with the blood and stimulates a series of reactions to form a silica- and calcium-rich surface gel that traps cellular and noncellular materials. As time passes, the matrix is transformed, remodeled, and replaced by newly formed osseous tissue⁽¹⁰⁾.

In spite of different periodontal regenerative approaches, as currently, not a single regenerative material is considered gold standard in the treatment of osseous defects; therefore, mixture of bioactive glass and Choukroun's PRF was utilized. In this case regeneration of bone can be seen in [figure 5]. similar bone fill was seen in case report published by biswas et al. in 2016 where combination of bioactive glass and prf as used in regeneration in furcation defects⁽¹¹⁾.

CONCLUSION

Addition of PRF to bioactive glass was effective for the management of localized intrabony defect but long-term randomized clinical trials should be undertaken for the final conclusion.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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