



STICKY BONE & A-PRF IN THE MANAGEMENT OF PERIIMPLANTITIS – A CASE REPORT

Dental Science

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ABSTRACT

Periimplantitis requires a comprehensive management with a combination of nonsurgical and surgical modalities. Predictable outcomes with autogenous and xenogenic bone grafts have been demonstrated. Platelet concentrates a good source of growth factors can be used for bone regeneration as well as soft tissue healing. This case report describes treatment of periimplantitis where sticky bone, prepared using autologous fibrin glue and demineralised bovine bone matrix, along with A-PRF membrane was used. Clinical healing and radiographic evidence of regeneration was satisfactory. Sticky bone is a viable alternative for regeneration in the surgical management of periimplant disease.

KEYWORDS

Periimplantitis, Regeneration, Bone graft, Platelet concentrates

INTRODUCTION

Implant as a treatment modality is the norm of the day. They are functionally and esthetically predictable option but periimplant disease as a complication is quite challenging to the clinician and cumbersome to the patient. Periimplant disease encompasses periimplant mucositis and periimplantitis. While periimplant mucositis is easily managed, periimplantitis requires non-surgical or surgical intervention depending upon the complexity and severity of involvement. One such surgical protocol is regenerative therapy. Bone replacement grafts alone or in conjunction with barrier membranes have shown good results.^[1]

The discovery of platelet concentrates has enriched regenerative periodontology. Platelets, a rich source of growth factors, orchestrate a pivotal role in wound healing. Platelet rich plasma (PRP), first introduced in hematology^[2] in 1970's, has progressed from its first generation to second generation platelet rich fibrin (PRF), concentrated growth factor (CGF) to A-PRF & I-PRF.

Sticky bone, which is basically growth factor enriched bone matrix was introduced by Sohn et al^[3] in 2010, wherein autologous fibrin glue (AFG) was mixed with bone graft to get "sticky bone". It helps in providing stability to the bone graft during the regenerative period. Sticky bone has many applications in periodontology and implant dentistry and this case report describes its combination with a-PRF in the management of periimplantitis.

CASE REPORT

A 20 year old female patient presented with a complaint of swelling in the gums above the tooth with dental implant with temporary crown that was placed 6 months ago. On examination, abscess with sinus opening was evident in relation to 11 (Figure 1). Intraoral periapical radiograph showed a bone loss up to the cervical third of the implant (Figure 1). No sign of mobility was detected. A thorough CHX irrigation was done followed by antibiotic regimen a week. Patient was apparently healthy with no history of systemic diseases or environmental contributory factors that would be detrimental to the implant management. Taking in to consideration the above clinical and x ray findings, surgical regeneration with sticky bone and a-PRF membrane was planned and patient consent was obtained for the procedure.

PREPARATION OF AFG & A-PRF

AFG was prepared following the protocol proposed by Sohn et al 2015.^[3] Venous blood (2X10ml) drawn from the median cubital vein in patient's forearm was divided into two types of vacutainers without anticoagulant. Non-coated test tube (yellow cap) was used to obtain AFG, which will make sticky bone and glass coated test tube (red cap), was used to obtain A-PRF membrane.

They were then centrifuged separately with a centrifuge with a rotor turning at alternated and controlled speed. The first cycle was at 2,400 to 2,700 rpm for 12 minutes. The RBC'S at the bottom layer was discarded and the upper layer consisting of AFG was drawn out with a syringe and mixed with bovine demineralised bone matrix and left undisturbed for polymerisation to occur. The other vacutainer was centrifuged at 1500rpm for 14 minutes to procure A-PRF. The exudate taken after compression of A-PRF layer was added to the sticky bone for acceleration of polymerization (Figure 2).

SURGICAL PROTOCOL

A mucoperiosteal flap was raised to expose the defect. Buccal dehiscence was seen. Following curettage, the defect site was filled with sticky bone and covered relieve A-PRF membrane and sutured around the site (Figure 3). Tension free interrupted sutures were placed and frenotomy was carried out to relieve frenal pull and the teeth were stabilized palatally. Antibiotic regimen (Amoxycillin) and anti-inflammatory drug (Ibuprofen) was prescribed for 5 days along with 0.12% Chlorhexidine mouth rinse for 2 weeks. The patient was recalled after 15 days for review and suture removal and an IOPA was taken after three months (Figure 3).

DISCUSSION

Bone regeneration involves a series of coordinated events, where growth factors are crucial in cellular proliferation, migration, differentiation as well as in neovascularisation.^[4] Exploitation of platelets seems to be beneficial in regeneration and has proven successful in orthopaedics, dermatology and dentistry.^[5] AFG & a-PRF are relatively easy to procure than the first generation of platelet concentrates, which require the addition of bovine thrombin and calcium chloride to accelerate the formation of the gel. Once the xenograft was added to AFG to form sticky bone, it was easy to handle and to adapt in and around the periimplant defect as it holds the bone graft particles together. The advantages of using sticky bone are multifold- movement of bone graft is avoided, entrapped platelets slowly and continuously release growth factors, ingrowth of soft tissue is prevented.^[4]

A-PRF was used as a membrane over the sticky bone. A-PRF is a blood concentrate and not a platelet concentrate and is based on low speed centrifugation concept and it combines the fibrin network, growth factors from the platelets and leucocytes for faster and complete neovascularization.^[6] This scores over commercially available resorbable membranes as it provides a natural scaffold and environment for regeneration to occur. Kökdere NN et al^[7] suggested that the use of PRF membrane as a barrier membrane over the sticky bone increases new bone formation due to the availability of growth factor enriched surrounding, thus leaving a positive effect on tissue healing. PRF has shown to induce a higher bone to implant contact than PRP in bony defects around implants.^[8] Clinically, the healing was satisfactory, the

implant and prosthesis stable and radiographic evidence three months post surgery showed adequate bone fill (Figure 9).

CONCLUSION

Harnessing the full potential of platelets to form sticky bone and growth factor enriched membrane (A-PRF) is a simple, less expensive and efficacious technique in the management of periimplantitis. Sticky bone, true to its given name, “sticks” the graft particles together, accelerates the early wound healing, thus facilitating regeneration.

CONFLICT OF INTEREST

Nil

LEGENDS FOR FIGURES



FIGURE 1 - Abscess in relation to implant in 11 and IOPA showing bone loss

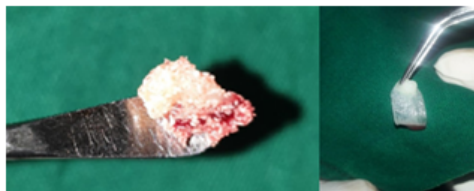


FIGURE 2 – Sticky bone and A-PRF



FIGURE 3 – Sticky bone placed and IOPA at 3 months showing good bone fill

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