

Case Report

Management of Peri-Implantitis with PRF as a Sole Grafting Material: A Case Report

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Abstract: PRF was used as a sole grafting material for surgically treatment of a 8 mm pocket around an implant that had 3 threads of bone loss, BoP, and exudate, and the patient was followed up for 1 year. Surgical treatment with the help of PRF, home care reinforcement, clinical indices records, and radiographic examination was done. The patient was monitored frequently for the first 3 months. Subsequently, maintenance visits were scheduled at 3 month intervals. The patient had a decreased probing pocket depth and a negative BoP index compared to initial clinical data, and the results were stable after a year. After 1 year of follow up visit, there appeared to be rebound of the bone level radiographically.

Keywords: Peri-implantitis, PRF, Surgical management, Periodontal maintenance

INTRODUCTION

At the first European workshop on periodontology in 1993, two disease patterns associated with oral implants were identified and defined. Peri-implant mucositis is a term used to describe reversible inflammatory reaction in the mucosa adjacent to an implant. Peri-implantitis is defined as an inflammatory process that affects the tissues around osseointegrated implant in function and results in loss of supporting bone. Diagnostic aspects regarding the peri-implantitis includes the mobility, bleeding on probing, attachment loss around implants and pus formation. A higher implant failure rate and elevated number of sites with periimplant bone loss were documented in periodontally compromised patients. nonsurgical periodontal treatment (NSPT) of periimplantitis is not predictable. Although minor beneficial effects of laser therapy on periimplantitis have been shown, which requires further evaluation. PRF is enriched with platelets, growth factors and cytokines increasing the healing potential of both hard and soft tissue [1]. PRF by Choukroun's technique is a simple and inexpensive technique for the successful regeneration of periodontal tissues. The main advantage is that PRF preparation utilizes the patient's own blood reducing or eliminating disease transmission through blood. More recently, Gassling *et al* have shown that PRF is a suitable scaffold for breeding human periosteal cells in vitro, which may be suitable for bone tissue engineering applications [2]. The use of PRF in periimplantitis therapy is an emerging

therapeutic option, although little reliable evidence present it suggests that it can effectively treat periimplantitis.

CASE REPORT

A 32 year old male presented with pain and swelling at a mandibular implant site (Myriad equinox). Clinical examination revealed a deep pocket [8mm pocket depth (PD)] and bleeding on probing [Fig 1], with suppuration and gingival inflammatory edema at the implant site. The patient was in good general health, did not take any medications, and was an occasional smoker (4-5 cigarettes/day). No occlusal trauma or parafunctional habits were detected. A periapical radiograph demonstrated bone loss of three fixture threads on the most distal and mid buccal mandibular left implant, when compared to the original radiograph [Fig 2]. The patient was scheduled for periodontal surgery to treat the inflammatory lesion, but emergency treatment was indicated to disinfect the area by removing the bacterial biofilm and alleviating pain using an diode laser. Nonsurgical periodontal instrumentation was performed with hand instrumentation using a plastic curette [Fig 3]. After re-evaluation of 6 weeks still there was pocket present on the distal and midbuccal region of the mandibular left implant site. Therefore it was decided to go for regenerative approach to treat the particular lesion. After induction of local anesthesia, buccal and lingual sulcular incisions were made, and mucoperiosteal flaps

reflected. Care was taken to preserve as much interproximal soft tissue as possible. Meticulous defect debridement were carried out using plastic curettes. Autologous PRF was introduced into the defect [Fig 4]. The mucoperiosteal flaps were repositioned and secured in place by sling sutures by using 3-0 non-absorbable black silk [fig 5]. The surgical area was protected and covered with periodontal dressing. Postoperative instructions were given, and the patient was prescribed amoxicillin 500 mg t.i.d and paracetamol 500 mg t.i.d for 5 days. The sutures were removed after one week. Surgical wounds were gently cleansed with 0.2% of chlorhexidine digluconate, and patients were given instructions for gentle brushing with a soft toothbrush. Healing was reviewed in subsequent visits at 1, 3, and 6 months. Periodontal indices were documented and intraoral periapical radiographs were taken at the 1 year [Fig 6]. Satisfactory results were obtained by the application of PRF in surgical periimplant therapy. Periodontal pocket depth was reduced from 8 to 3 mm with no bleeding upon probing. Intraoral periapical radiographs, taken up to 1 year during 3 months of interval post-nonsurgical treatment, provide evidence of some improvement of the bone level. The reduction of periodontal pockets is probably due to re epithelialization, with formation of a long junctional epithelial attachment.

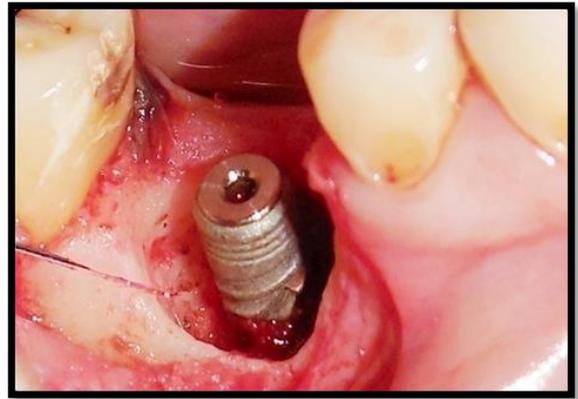


Fig-3: After Debridement with plastic curettes



Fig-4: Placement of PRF



Fig-1: Pre-operative View



Fig-5: Sutures placed



Fig-2: Pre-operative IOPA



Fig-6: Post-operative IOPA after 1 yr

DISCUSSION

The aim of periodontal therapy is to arrest and control the periodontal infection and ultimately regenerate lost periodontal structures [3]. Newer approaches to periodontal therapy include regenerative procedures that aim to restore lost periodontal ligament, bone, cementum, and connective tissue. The complete regeneration of the periodontium after periodontal treatment modalities has been difficult to achieve because of differences in the healing abilities of different periodontal tissues [4]. In recent times, the local application of biologic modifiers, such as growth factors, has been investigated for use in the promotion of periodontal regeneration and healing. These agents act by augmenting the wound healing process through anabolic bone formation, angiogenesis, cementogenesis, osteoblast differentiation, mitosis, chemotaxis, and other processes that improve the healing environment. Biologic modifiers, including enamel matrix derivative (EMD), platelet derived growth factor (PDGF), bone morphogenetic protein (BMP), platelet-rich plasma (PRP), PRF, fibroblast growth factor (FGF), and parathyroid hormone (PTH), have all shown promise in enhancing regeneration [5-9]. At present, one of the most widely used periodontal regenerative modalities is bone graft therapy. Unfortunately, the application of bone graft materials derived from the host or other living tissues may be limited by their inherent limitations. The present case evaluates the clinical efficacy of PRF in the treatment of peri-implantitis defect. The uneventful healing in the defect area supporting the excellent ability of autologous PRF to enhance periodontal wound healing. PRF afforded a great improvement in soft and hard tissue regeneration. PRF consists of a fibrin matrix polymerized in a tetra molecular structure; the incorporation of platelets, leukocytes, and cytokines; and circulating stem cells [10, 11]. Slow fibrin polymerization during PRF processing leads to the intrinsic incorporation of platelet cytokines and glycan chains in the fibrin meshes. This result implies that PRF, unlike the other platelet concentrates, can progressively release cytokines during fibrin matrix remodelling. This mechanism might explain the clinically observed healing properties of PRF. However, none of the study till date have shown the great potential of PRF in management of peri-implantitis as a sole grafting material.

CONCLUSION

Results of the case present here showed that treatment approach with PRF was effective in treating the peri-implant defects. Ideal amount of the components of PRF preparation are still being investigated, and more clinical researches are required to assess the longterm effectiveness of PRF therapy as a sole grafting material in the treatment of peri-implantitis defects.

REFERENCES

1. Deodhar AK, Rana RE; Surgical physiology of wound healing: a review. *J Postgrad Med* 1997;43:52-6.
2. Gassling V, Douglas T, Warnke YA, Wiltfang J, Becker ST; Platelet-rich fibrin membranes as scaffolds for periosteal tissue engineering. *Clin Oral Impl.*, 2010; 21: 543-549
3. Wang HL, Greenwell H; Surgical periodontal therapy. *Periodontol.*, 2001; 25:89-99.
4. Cho MI, Lin WL, Genco RJ; Platelet-derived growth factor modulated guided tissue regenerative therapy. *J Periodontol.*, 1995; 66:522- 530.
5. Giannobile WV, Somerman MJ; Growth and amelogenin-like factors in periodontal wound healing. A systematic review. *Ann Periodontol.*, 2003; 8:193-204.
6. Nevins M, Giannobile WV, McGuire MK, Kao RT, Mellonig JT, Hinrichs JE, McAllister BS, Murphy KS, McClain PK, Nevins ML, Paquette DW; Platelet-derived growth factor stimulates bone fill and rate of attachment level gain: results of a large multicenter randomized controlled trial. *Journal of periodontology*, 2005; 76(12):2205-15.
7. Jung RE, Glauser R, Schaerer P, Hammerle CH, Sailer HF, Weber FE; Effect of rhBMP-2 on guided bone regeneration in humans. *Clin Oral Implants Res.*, 2003; 14:556-568.
8. Heijl L, Heden G, Svardstrom G, Ostgren A; Enamel matrix derivative (EMDOGAIN) in the treatment of intrabony periodontal defects. *J Clin Periodontol.*, 1997; 24:705-714.
9. Bashutski JD, Eber RM, Kinney JS, Benavides E, Maitra S, Braun TM, Giannobile WV, McCauley LK; Teriparatide and osseous regeneration in the oral cavity. *New England Journal of Medicine*, 2010; 363(25):2396-405.
10. Choukroun J, Diss A, Simonpieri A, Girard MO, Schoeffler C, Dohan SL, Dohan AJ, Mouhyi J, Dohan DM; Platelet-rich fibrin (PRF): a second-generation platelet concentrate. Part IV: clinical effects on tissue healing. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, 2006; 101(3):e56-60.
11. Choukroun J, Diss A, Simonpieri A, Girard MO, Schoeffler C, Dohan SL, Dohan AJ, Mouhyi J, Dohan DM; Platelet-rich fibrin (PRF): a second-generation platelet concentrate. Part V: histologic evaluations of PRF effects on bone allograft maturation in sinus lift. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, 2006; 101(3):299-303.