

Regenerative Periodontal Therapy Using Dmbm (Osseograft™) and Amnion Membrane: A Clinical Case Series

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Abstract

The periodontium consists of cells and tissue complex organized into basic components of gingiva, cementum, periodontal ligament and alveolar bone. The challenge of regeneration is to reconstitute this complex. Periodontal regeneration is quite a complex and challenging task to achieve. Clinical and biological concept based newer treatments have further evolved the concept of periodontal regeneration. Guided tissue regeneration with the use of bone grafts is a well known treatment modality in periodontal regeneration. This is a clinical case series where regenerative periodontal therapy was used in different alveolar bone defects with successful outcomes.

Keywords: Periodontal Regeneration; DMBM (Osseograft™); Amnion Membrane

Introduction

The challenge of periodontal regeneration has come to the forefront of periodontal research and practice. In the overall evolution of periodontal therapy, attention was focused upon the arrest of disease and long-term maintenance of the dentition. Research regarding periodontal therapy has made it clear that Standard treatment techniques do not result in periodontal regeneration. It has also become apparent that, if the goal of periodontal regeneration is to be realized, the problem of regeneration needs to be approached from a basic biological perspective.

Periodontal regeneration is quite a complex and challenging task to achieve. But recently with advancements in materials and methods it is being practised in routine by the Periodontists with successful outcomes. Clinical and biological concept based newer treatments have further evolved the concept of periodontal regeneration [1]. Melcher hypothesis dictates our current periodontal healing model. Reinstitution of both the structure as well as function of lost periodontal tissues constitutes the concept of regeneration [2]. The following is clinical case series of 3 cases where regenerative periodontal therapy was used combining DMBM (Osseograft™) and Amnion membrane. Amnion membrane was procured from Tata Memorial hospital, Mumbai.

Case series

Case 1

A 30 years old female presented to the Department of Periodontology, Seema Dental College and Hospital, Rishikesh with the chief complaint of pain and pus formation in her lower left back tooth region. On clinical and radiographic examination abscess was seen i.r.t 46 (Figure 1A), the tooth was root canal treated (Figure 1B). Pus drainage was done and patient was put on antibiotics and analgesics and was recalled after 5 days. After 5 days the abscess has recurred again, so surgical abscess drainage was planned. Upon flap reflection and debridement an intra-bony defect was seen i.r.t. 46 (Figure 2-3). DMBM bone graft (Osseograft™) was placed after complete debridement followed by placement of amnion membrane (Figure 4). The flap was sutured back (Figure 5) followed by placement of coe-pak. Post-operative instructions were given and antibiotics and analgesics were prescribed. Patient was recalled after 10 days. On follow up visit, coe-pak and sutures were removed (Figure 6). The area was irrigated with saline. Patient was put on further monthly follow-up initially for 3 months and after that bi annually.

Figure 1A: Preoperative.

Figure 1B: IOPA.

Figure 2: Flap Reflection and Debridement.

Figure 3: Intra-bony defect.

Figure 4: Placement of bone graft and membrane.

Figure 5: Suture placement.

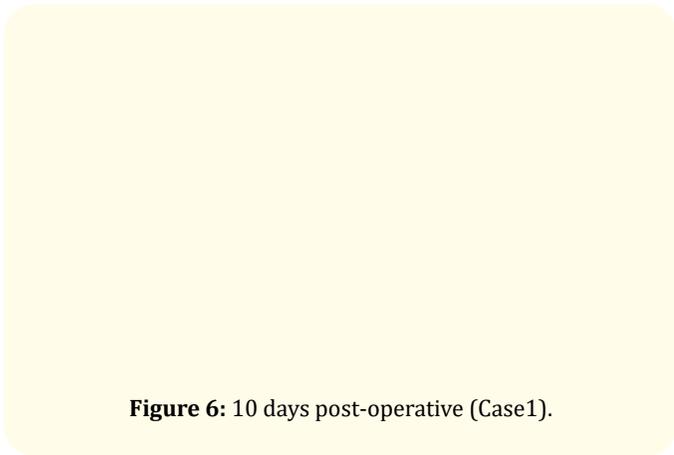


Figure 6: 10 days post-operative (Case1).

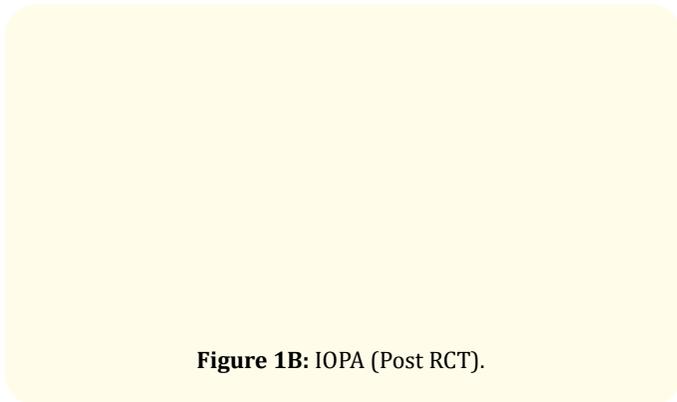


Figure 1B: IOPA (Post RCT).

Case 2

A 42 years old male presented with the chief complaint of trauma and pain in his lower front teeth region. Patient gave history of accidental trauma in that region few days back. IOPA showed bone loss in that region. Tooth vitality was checked and root canal was done in all lower incisors (Figure1A-1B). Patient was satisfied and was relieved of pain and went happily. After 1 week patient came back complaining of pain again in that same region. Radiograph showed radiolucency in that particular region so surgical flap debridement was planned. Upon flap reflection a fenestration defect was seen in the buccal alveolar process (Figure 2-3). After complete debridement DMBM bone graft (Osseograft™) was placed followed by placement of Amnion membrane (Figure 4-5). Flap was replaced and sutured (Figure 6) and coe-pak was given. Post-operative instructions were given and Antibiotics and analgesics were prescribed. Patient was recalled after 10 days for suture removal.

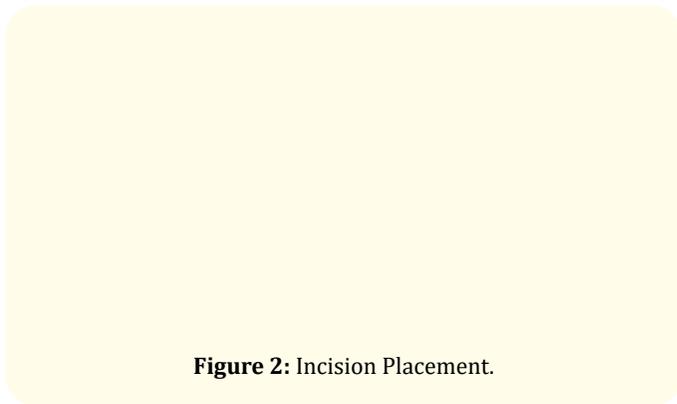


Figure 2: Incision Placement.

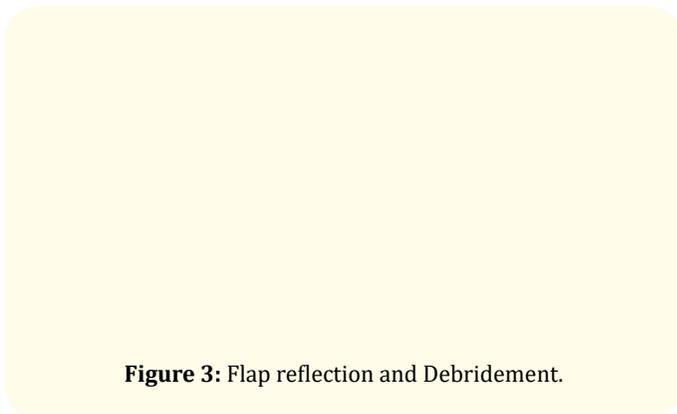


Figure 3: Flap reflection and Debridement.

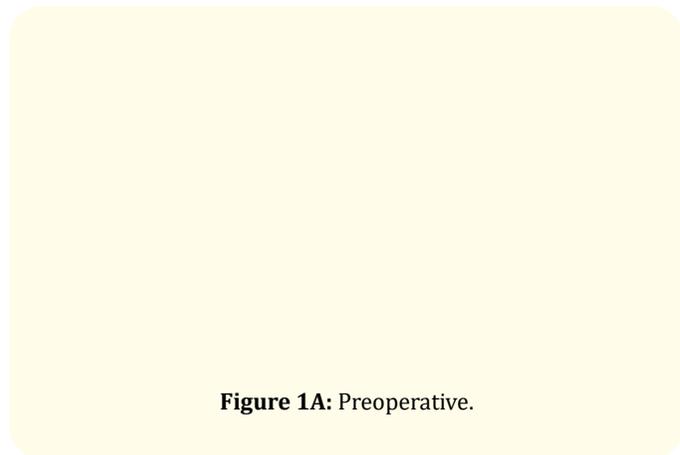


Figure 1A: Preoperative.

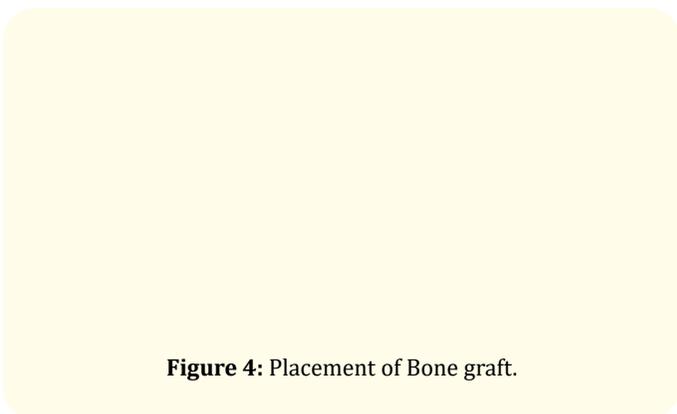


Figure 4: Placement of Bone graft.

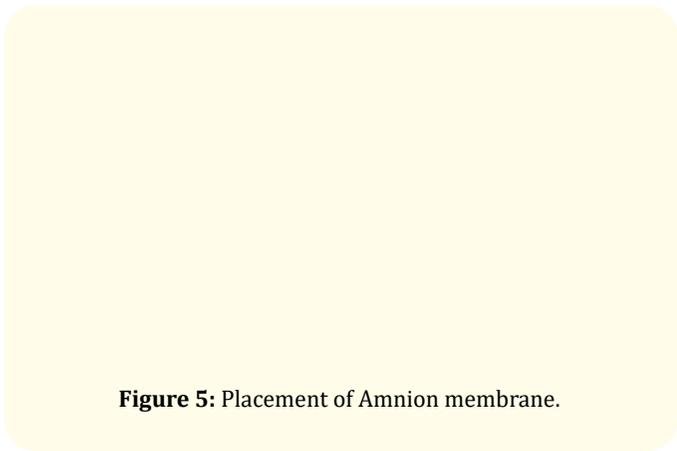


Figure 5: Placement of Amnion membrane.

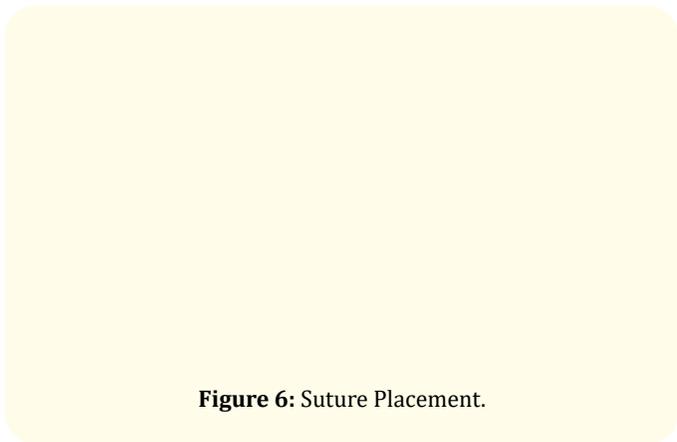


Figure 6: Suture Placement.

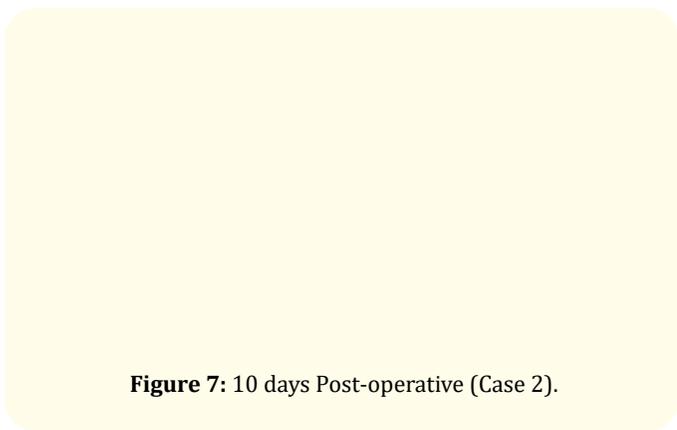


Figure 7: 10 days Post-operative (Case 2).

Case 3

A 37 year old female presented with the chief complaint of food lodgement in her right lower back tooth region. On examination

a 9 mm deep periodontal pocket was seen i.r.t. 36 with grade III furcation involvement. IOPA showed periapical radiolucency and an intra bony defect i.r.t 36 (Figure1A-1B). Root canal was done i.r.t 36. 3 - 4 weeks post completion of root canal, regenerative periodontal therapy was planned. Open flap debridement was done followed by placement of DMBM bone graft (Osseograft™) and barrier membrane Amnion was placed to promote regeneration (Figure 2-3). Flap was sutured back (Figure 4) and patient was recalled after 10 days. Post operative instructions were given and antibiotics and analgesics were prescribed.

On follow-up visit, coe-pak and sutures were removed. The area was irrigated with saline. Patient was put on further monthly follow-up initially for 3 months and after that bi annually (Figure 5A-5B).

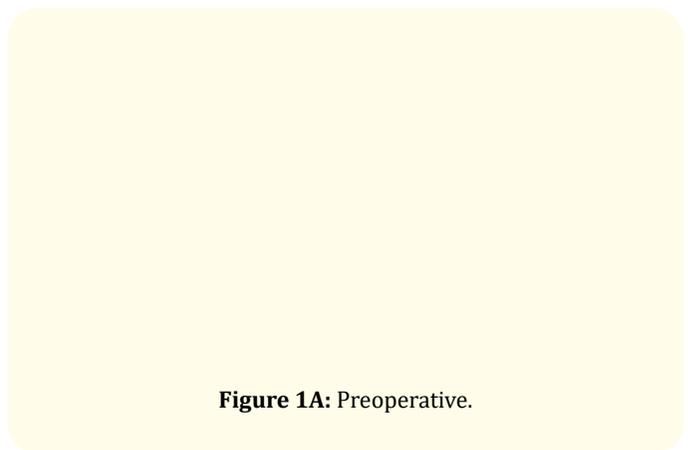


Figure 1A: Preoperative.

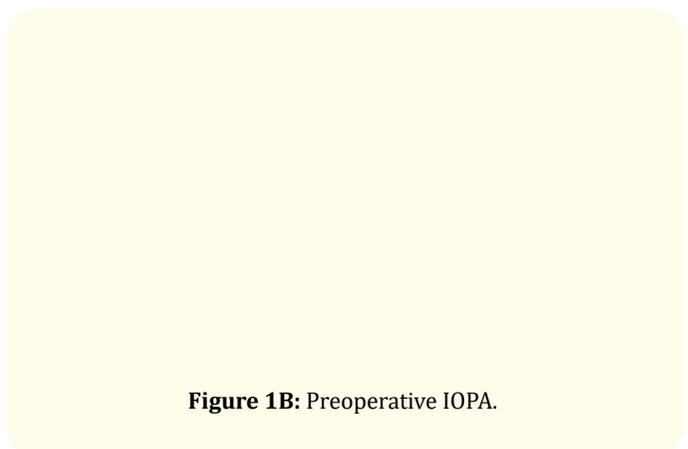


Figure 1B: Preoperative IOPA.

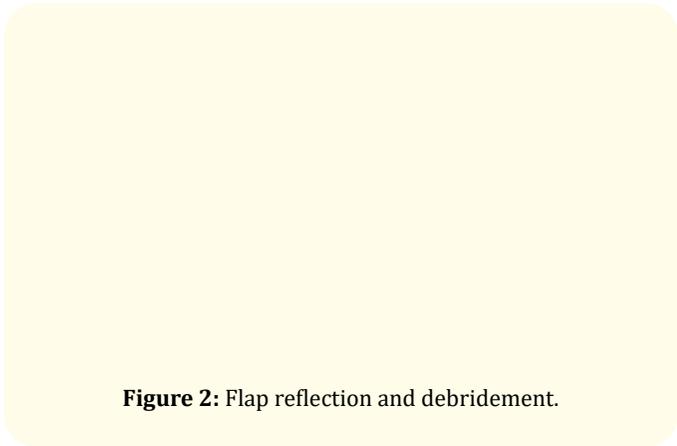


Figure 2: Flap reflection and debridement.

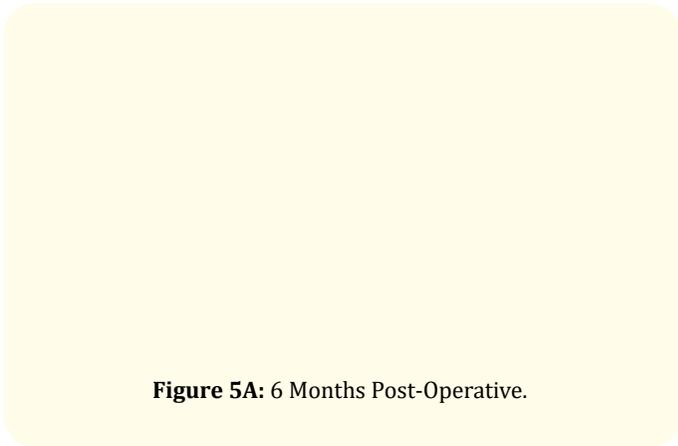


Figure 5A: 6 Months Post-Operative.

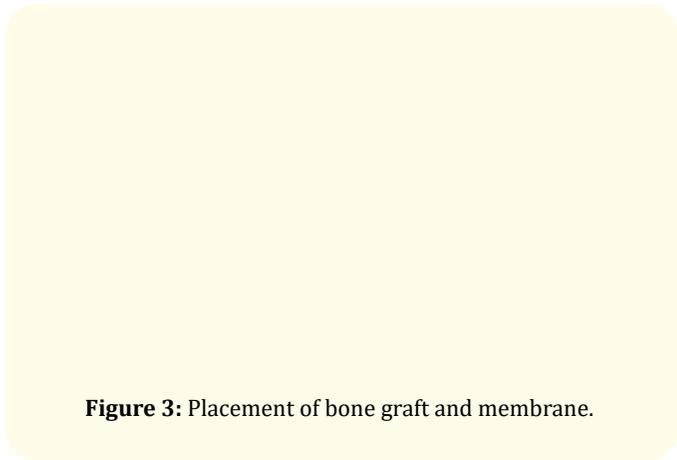


Figure 3: Placement of bone graft and membrane.

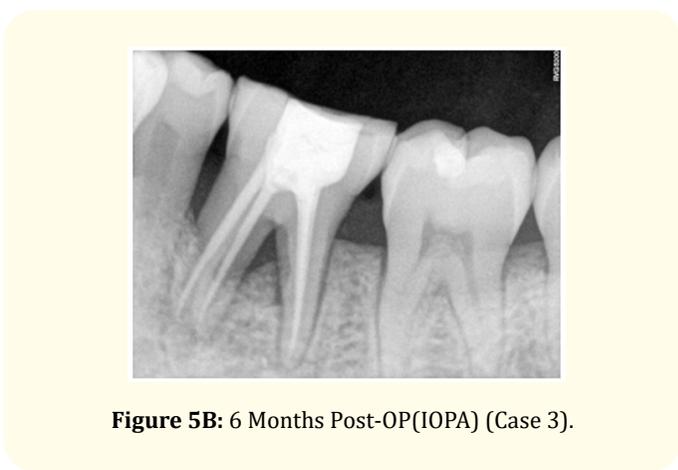


Figure 5B: 6 Months Post-OP(IOPA) (Case 3).

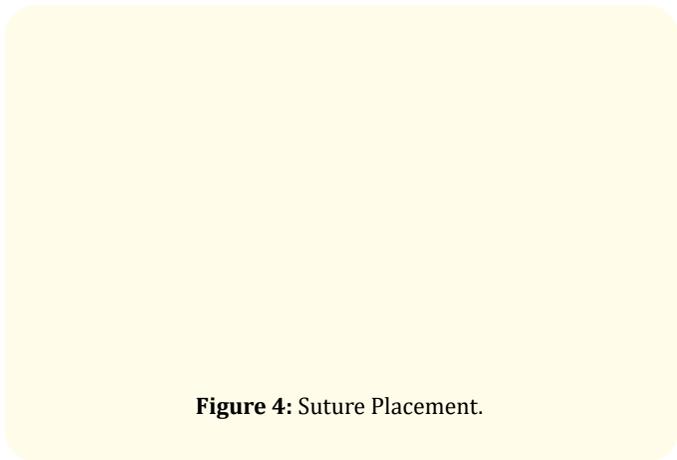


Figure 4: Suture Placement.

Discussion

Following periodontal disease, complete regeneration of periodontal tissues remains a challenging task. Guided tissue regeneration with the use of bone grafts is a well known treatment modality in periodontal regeneration.

DBBM is an Osteoinductive grafting material that provides a biologic stimulus that induces the progression of mesenchymal stem cells and other osteoprogenitor cells towards osteoblast lineage [3]. Osteoinduction is a process that stimulate the phenotypic conversion of progenitor cells within the healing wound to those that can form osseous tissue [4].

Demineralized bone matrix is produced by acid extraction of allograft. It contains predominantly type-1 collagen, various non collagenous proteins and osteoinductive growth factors [5].

Amnion was used as a barrier membrane to enable the periodontal ligament cells to repopulate the area [6]. Amnion membrane is the innermost lining of the fetal membrane. It has the biologic properties that promote wound healing and reduces inflammation [7]. Fetal membranes were first used in 1910 by Davis as skin substitutes to treat open wounds [8]. This membrane is rich in collagen type III, IV and V. It also contains in abundance cell adhesion factors like laminins and fibronectin [9].

The results of this clinical case series reveal that use of DMBM (Osseograft™) combined with use of Amnion membrane promote periodontal regeneration. The radiographic evidence also supports the results of this study. However further research and long term clinical trials are required to know their full potential in regenerative periodontal therapy.

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