

## Case Report

## Unusual Bone Defect Management Using Amniotic Membrane as Guided Tissue Regeneration – A Case Report

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**Abstract:** Guided tissue regeneration has emerged as a promising treatment modality in periodontal defects. A variety of non-resorbable and bioresorbable membranes have been successfully used. Among resorbable membranes, collagen has been extensively studied. Recently, amnion membrane, the third generation membrane which is a placental derived tissue has been introduced. On the basis of the findings of the present case report, it can be concluded that recently introduced amnion membrane (third generation membrane) are equally efficacious in the treatment of periodontal regeneration in terms of true regenerative potential. Amnion membrane has certain additive advantages over the collagen membrane such as better handling properties and a thin diameter enabling it to mold according to the defect anatomy and root surfaces easily.

**Keywords:** Amniotic membrane, true regeneration, guided tissue regeneration

### INTRODUCTION

The gingival tissue has been compared with fetal tissues in its structure, fibroblast phenotype and scarless healing [1, 2]. Amnion membrane is an allograft with many unique properties that make it a promising new substitute in the field of periodontics. It contains a variety of specialized proteins such as fibronectin, laminin, proteoglycans, glycosaminoglycan's and collagen type IV, V and VII. It not only provides a matrix for cellular migration and proliferation but also enhances the wound healing process [3].

### CASE REPORT

A 38-year-old female patient reported with a chief complaint of gum swelling and pain on chewing in the upper right back tooth region since 3 months. Her medical and family histories were non-contributory. On clinical examination, deep dental caries and sinus opening with positive tenderness on percussion was observed in relation to the tooth number 15. Radiological examination with gutta-percha sinus tracing revealed radiolucent change in bone on the mesial aspect of 15 at junction of middle and apical third (Figure 1). The treatment plan consisted of root canal therapy in relation to 15 and periodontal access flap surgery and defect debridement with bone graft and placement of an amnion membrane (Tissue bank, Tata Memorial Hospital, India).

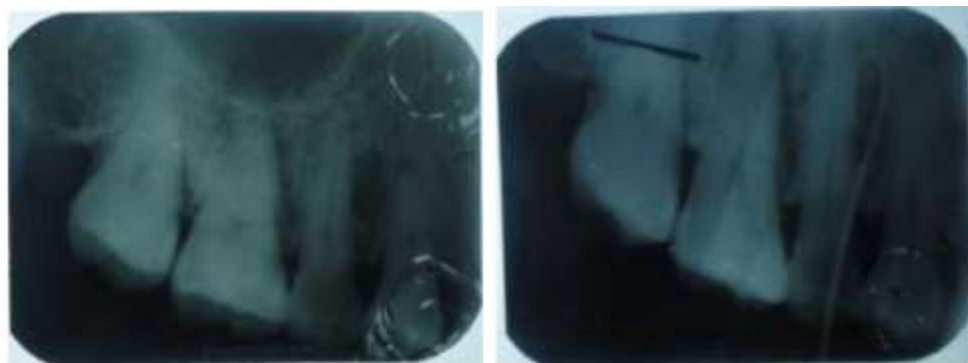


Fig-1: Preoperative radiological examination with sinus tracing revealing the defect

### CASE MANAGEMENT

An informed consent was obtained from the patient for the same. The patient was given oral hygiene instructions and supragingival scaling and root planing was performed. Root canal therapy was completed. After achieving adequate anaesthesia using Lignocaine hydrochloride 2%, an access flap (full thickness periosteal) was elevated, following which the exposed root surface was thoroughly planed and the bone defect was debrided. The bone defect observed was having intact marginal bone mimicking a tunnel (Figure 2) and bone graft was packed in the defect and the membrane size was calculated as 2 mm more on all sides (apically, mesially and distally) to be of sufficient dimension to cover the bone defect (Figure 3). The membrane was then placed over the bone defect and the flap was sutured back in position with 3-0 BBS sutures (Figure 4). Keeping in mind the adhesive properties of the amnion, the membrane was not sutured. Postoperative instructions, a combination of Diclofenac sodium (50 mg) Paracetamol 325 mg twice daily for 3 days, amoxicillin 500 mg thrice for 5 days and a Chlorhexidine mouth rinse 0.2% twice daily for 2 weeks were prescribed to the patient.



**Fig-2: Full thickness periosteal flap raised and the bone defect is seen**



**Fig-3: Bone defect packed with bone graft and amnion membrane**



**Fig-4: Simple interrupted 3-0 BBS sutures placed**

The patient was recalled after 7 days and was followed up till 9 months (Figure 5). Complete healing and bone formation, with excellent tissue contour and colour blend, was observed over the period of follow-up.



**Fig-5: 9 months post operative radiographic picture showing marked bone formation**

### DISCUSSION

The gingival tissue has been compared with fetal tissues in its structure, fibroblast phenotype and scarless healing [1, 2]. Amnion membrane is an allograft with many unique properties that make it a promising new substitute in the field of periodontics. It contains a variety of specialized proteins such as fibronectin, laminin, proteoglycans, glycosaminoglycan's and collagen type IV, V and VII. It not only provides a matrix for cellular migration and proliferation but also enhances the wound healing process [3]. It contains a large number of cytokines including transforming growth factor- $\beta/\alpha$ , vascular endothelial growth factor, epidermal growth factor, platelet-derived growth factor- $\beta/\alpha$  and fibroblast growth factor [4]. It has been reported to be non-immunogenic, to reduce inflammation, reduces scar tissue, has antibacterial properties, reduces pain at the site of application and acts as a natural biological barrier [3].

Such wound modulating properties make it an interesting new option for application in oral wound

healing [5]. In the present case, we observed that amnion allograft has certain additive advantages over the collagen membrane such as better handling properties and a thin diameter enabling it to mold according to the defect anatomy and root surfaces easily along with formation of bone around the defect and favourable true regeneration potential by following the guided tissue regeneration concept. The results were stable for 6 months post treatment. Another interesting finding was the enhancement of gingival biotype. A thick biotype has a tendency toward maintaining a more stable soft tissue in various periodontal surgical procedures [6] hence, all the optimum desired results as an allograft for guided tissue regeneration was obtained by using amnion allograft.

### CONCLUSION

This case report presents a novel material amnion allograft, its inherent wound-modulating properties may be used to enhance periodontal wound healing and enable true periodontal regeneration. Amnion allograft may provide an alternative to other conventional methods of treating other periodontal defects such as gingival recession, furcation involvement. The results from the present report are encouraging and demonstrate that the amnion allograft is well tolerated by the gingival and periodontal tissues and results in excellent healing. More studies exploring the potential of this allograft in periodontal therapies are required. This report paves a way for future studies that may investigate its application in other fields of periodontics and oral surgery.

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