



## Case Series

## Coronally repositioned flap procedure for gingival root coverage using human derived regenerative membranes - A case series

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## ABSTRACT

**Background:** The aim of this case series was to evaluate the effectiveness of platelet rich fibrin (PRF), Amnion and chorionic membrane for root coverage procedures using a coronally repositioned flap (CRF).

**Materials and Methods:** Three subjects with Miller's class I gingival recession were randomly selected for treatment using CRF with PRF, Amnion and Chorion membranes. The clinical parameters evaluated at baseline and 6 months follow up included: probing depth (PD), relative attachment level (RAL), recession height (RH), recession width (RW), width of keratinized tissue (WKT) and Gingival thickness (GT).

**Results & Conclusion :** Within the limits, this case series has shown that the use of human derived regenerative membranes along with CRF resulted in complete root coverage in Miller's Class I gingival recessions in much lesser time. The rapid healing and regeneration of these membranes stands as an alternative for connective tissue autografts and holds promise for future.

**Keyword:** Gingival thickness (GT), Relative Attachment level (RAL), Width of Keratinized Tissue (WKT)

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### 1. Introduction

Gingival recession is defined as the exposure of the root surface due to the movement of the gingival margin in the apical direction. Many surgical techniques, such as laterally positioned flaps, coronally repositioned flaps (CRF), free gingival grafts, have been proposed to achieve gingival root coverage<sup>1</sup> Among these techniques, the connective tissue autograft (CT) is considered as gold standard because of its high prognosis. However it requires additional surgical site for graft harvesting, which causes more discomfort and bleeding.<sup>2</sup> Whereas CRF is performed easily, as it involves coronal movement of soft tissue on the exposed root surface and there by eliminates clinical difficulties associated with the donor site.

The coronally repositioned flap (CRF) procedure was first presented by Norberg in 1926. It is mostly combined with copious different materials<sup>3</sup> like guided bone & tissue regenerative membranes (GBR/GTR), which helps in periodontal regeneration.

One of such regenerative material is Platelet rich fibrin (PRF). It is a second generation platelet concentrate and an autologous leukocyte. Choukroun developed it in 2001.<sup>4</sup> PRF releases various growth factors that aids in faster healing and automates inflammatory activity. It is a living biomaterial, not a commercially available inert membrane.

On the other hand, Novel membranes that are in use for GTR are foetal membranes. They acquire distinctive natural properties that facilitate wound healing and may enhance regeneration. Both amniotic (AM) and chorionic (CM) membranes are now being used as economical, allogenic replacement for the CT graft for accomplishing

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root coverage.

## 2. Aim

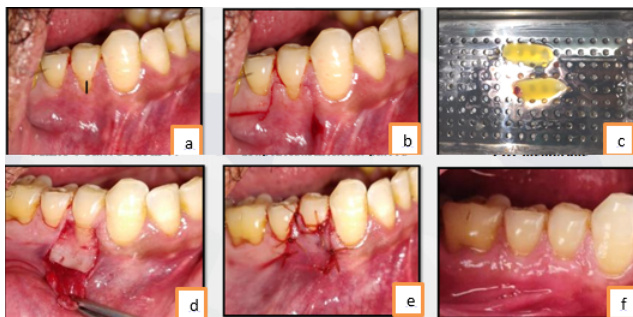
This case series aims to evaluate the effectiveness of PRF, Amnion and chorionic membranes for treatment of gingival recession using a coronally repositioned flap.

## 3. Case Presentation

Systemically healthy participants, having Miller's Class I gingival recession defects were arbitrarily selected for treatment using CRF with PRF (1), Amnion (1) and chorionic (1) membranes. Subjects screened for the study completed consent process. The clinical parameters evaluated at baseline and 6 months follow up included: probing depth (PD), relative attachment level (RAL), gingival recession height (RH), recession width (RW), width of keratinized tissue (WKG) and Gingival thickness (GT). A periodontal probe was used to make evaluation. RH was evaluated from CEJ to marginal gingival [Figure 1], RW was evaluated mesiodistally at CEJ, RAL was evaluated from CEJ to the pocket depth, WKG was evaluated from the most apical point on marginal gingiva to mucogingival junction (MGJ), and GT was evaluated at centre point location between the most apical point of gingival margin and MGJ. After anesthetizing, a file with a stopper was inserted at 90° to the mucosal surface until hard tissue was felt. After removal of the file, the space between the tip of file and stopper was calculated with a digital analyzer.

### 4. Case I

A 29-year old male patient reported to the Perio Department, Mamata Dental College (MDC), Khammam, Telangana, with a chief complaint of downturn shifting of gums in lower right back teeth region. Clinical and Radiographic examination reveals, Miller's Class I gingival recession with 44, having PD-2mm, RAL-5mm, RH-3mm, RW-4mm, WKG-3mm and GT-1mm (Figure 1 a).



**Fig. 1:** a: Millers class I GR in 44 b: Trapezoidal incisions placed c: PRF membrane d: PRF placed as the membrane e: Flap advanced and sutured f: Post operative 6 month

### 4.1. Pre-surgical therapy

Initially, oral prophylaxis was done and dental health education given. Necessary blood investigations were done in all the patients. Patient recalled after 2 weeks for surgical therapy.

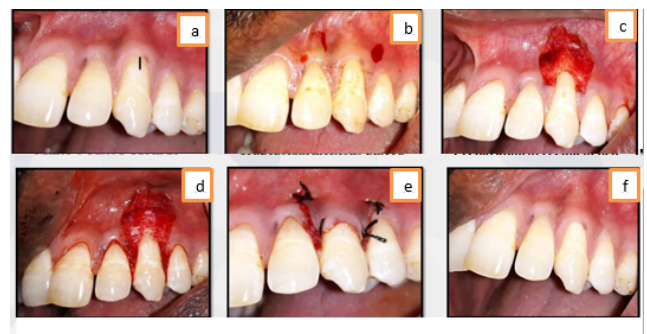
### 4.2. Surgical therapy

Firstly adequate local anesthesia is carried out with infiltration. Papilla preservation incisions were then made on mesial & distal sides of involved tooth using scalpel no.15. Then an oblique incision was made to limit the area of operation. Next, a full-thickness flap is opened by using the periosteal elevator until the mucobuccal fold followed by a split thickness flap (Figure 1 b). The operating area is irrigated with saline solution.

For PRF, I.V blood was drawn from the patient and collected without anticoagulant in test tubes. It is then centrifuged immediately at 3,000 rpm for 10 minutes. Thus leads to formation of PRF, in between red blood corpuscles and platelet poor plasma [PPP]. PRF was separated using sterile tweezers and scissors.<sup>4</sup> Then placed into a PRF box and compressed. This causes squeezing of serum and a stabilized fibrin membrane was formed (Figure 1 c). Moulded into required dimensions and placed at recipient site (Figure 1 d). The flap is positioned coronally and sutured with 5-0 vicryl sutures (Figure 1 e) followed by placing a non-eugenol dressing.

### 5. Case II

A 23yrs old male patient reported to the Perio Department, MDC, Telangana, with a chief complaint of sensitivity in upper left front teeth region. On Intra oral examination patient has Miller's Class I gingival recession with #23, having PD-1mm, RAL-4mm, RH-3mm, RW-5mm, WKG-4mm and GT-1mm (Figure 2 a).



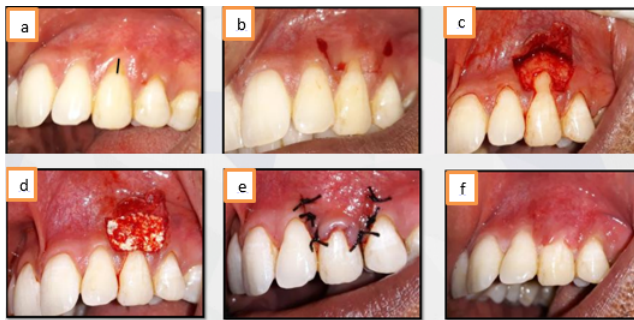
**Fig. 2:** a: Miller's class I GR in 23 b: Trapezoidal incisions placed c: Preparation of recipient bed d: Placement of amniotic membrane e: Flap advanced and sutured f: Post-operative

Pre surgical & Surgical therapy were same as Case-1 (Figure 2 b). Instead of PRF membrane, Freeze dried

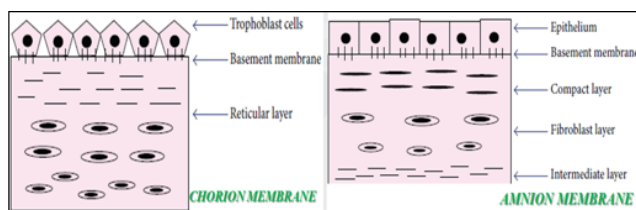
irradiated Amniotic membrane procured from Tissue Bank Centre of TATA MEMORIAL HOSPITAL, Mumbai was used. After cutting into required dimensions, membrane was placed at recipient site (Figure 2 d) and closely adapted with sling sutures (Figure 2 e) followed by a periodontal dressing.

### 6. Case III

A 26years old female reported to the Perio Department, MDC, Telangana, with a chief complaint of receding gums in upper left front teeth region. Clinical examination reveals Miller's Class I gingival recession with #23, having PD-1mm, RAL-4mm, RH-3mm, RW-4mm, WKG-4mm and GT-1mm (Figure 3 a). Pre surgical & Surgical therapy were same as Case-1(Figure 3 b). Freeze dried irradiated Chorionic membrane procured from Tissue Bank Centre of TATA MEMORIAL HOSPITAL, Mumbai was used. After cutting into required dimensions, membrane was placed at recipient site (Figure 3 d) and closely adapted with sling sutures (Figure 3 e) to avoid dead space. Periodontal dressing, coe-pak is applied.



**Fig. 3:** a: Miller's class I GR in 23 b: Trapezoidal incisions placed c: Preparation of recipient bed d: Placement of chorionic membrane e: Flap advanced and sutured f: Post operate



**Fig. 4:**

#### 6.1. Post-surgical phase

Patients were called back after one week for removal of periodontal dressing. Antibiotics and NSAIDS were prescribed for 5 days and directed not to brush in the treated area. Chlorhexidine solution (0.2%) twice daily for 1 min is recommended. Supragingival debridement was done at third month recall visit and evaluation of clinical parameters was

done at sixth month follow up.

### 7. Discussion

The post surgical outcome was good in all the patients and no adverse reactions were noticed. There was gain in RAL, RH, RW, WKG & GT in all the cases suggesting that recession coverage was equally achieved in all groups.

Coronally repositioned flap is an effective method for root coverage with good clinical results. It provides great aesthetic outcome as the tissue used to cover the recession site matches in colour, texture and thickness. The indications for CRF are the presence of 1 mm keratinized tissue apical to the recession site for shallow recession's and 2 mm for recession's  $\geq 5$  mm and thickness.<sup>5</sup>

The urge of the development of bioactive regenerative membranes that regulates inflammation and aids in healing had become one of the greatest challenges facing in clinical research. A latest novelty in dentistry is the preparation and use of PRF. The auto polymerization process in PRF preparation allows enmeshment of growth factors, platelets & cytokines in the thick fibrin matrix, permitting release of growth factors for extended period, enhancing tissue healing.<sup>6</sup> An extra edge of PRF is the presence of leukocytes and cytokines that allows auto regulation of infectious & inflammatory processes.

Del Corso (2009) determined the use of PRF in the treatment of root coverage at multiple sites with coronally repositioned flap procedure and found significant gain during early healing phase, with a stable final remodeled gingiva.<sup>7</sup>

PRF membranes should be used right away after preparation as they dehydrate, which will change the biologic characteristics. Thus newer biologic membranes overcoming these disadvantages have been recently researched. The vital factor that determines the beneficial outcome with GTR is the physical character of the membrane that is being used, particularly the configuration and mechanical strength. Observing the histological architecture of foetal membranes, Chorion is composed of trophoblasts, basement membrane and reticular layer & Amnion is composed of epithelial monolayer, a thick basement membrane, compact layer, fibroblast layer and intermediate layer (Figure 4).<sup>8</sup> Type I, IV, V, VI collagen, laminin, proteoglycans and fibronectin are rich in these placental membranes. They possess antimicrobial & antibacterial traits, decreases swelling at the wound site by the existence of MMP'S & IL'S. These inherent properties aids in rapid vasculogenesis, epithelialization and most importantly an ample source of stem cells has made these placental tissues an advisable choice in treatment of gingival recession.<sup>9,10</sup>

Lafzi et al (2014) in a split mouth study compared AM & CT for root coverage and described that use of amniotic membrane instead of CT reduced surgical duration &

discomfort of the patient considerably; however, recession coverage between the two methods was not significantly different.<sup>11</sup>

Dandekar et al. (2019) evaluated and compared the efficacy of CM and PRF membrane in the treatment of Miller's Class I and Class II recession defects and concluded that both are successful materials in root coverage, but chorionic membrane showed better and more stable results at the end of 6 months as compared to PRF membrane in treating gingival recession.<sup>12</sup>

## 8. Conclusion

Within the limits, the present case series has shown that the use of human derived regenerative membranes PRF, Amnion and Chorion along with coronally repositioned flap resulted in complete recession coverage in Miller's Class I gingival recession in much lesser time. The ease of applying these membranes and its beneficial outcomes, including rapid healing and regeneration stands as an alternative for connective tissue auto grafts and holds promise for future.

## 9. Source of Funding

None.

## 10. Conflict of Interest


None.

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