

## CASE REPORT



## Recession coverage using coronally advanced flap with Pericardium® membrane (collagen Type I) - A case report

Pooja Mishra<sup>1</sup>, Deepa Dhruvakumar<sup>2</sup>

<sup>1</sup>Department of Periodontology, Subharti Dental College and Hospital, Meerut, Uttar Pradesh, India, <sup>2</sup>Department of Periodontology, Theerthankar Mahaveer Dental College and Research centre, Moradabad, Uttar Pradesh, India

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### Correspondence:

Deepa Dhruvakumar, Department of Periodontology, Theerthankar Mahaveer Dental College and Research centre, Moradabad, Uttar Pradesh, India, E-mail: deepa\_arun@rediffmail.com.

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### Abstract

Apical migration of the marginal gingiva beyond the cemento-enamel junction causing exposure of the root surface is called gingival recession. This mucogingival deformity presents a significant esthetic problem. As sequelae, it could lead to pain due to the dentinal exposure or caries of the root. Several approaches and techniques have been advocated for root coverage with predictable success. Here, we present a case report, in which root coverage has been successfully achieved in gingival recession of Class I Miller's by coronally advanced flap with Pericardium® membrane.

### Introduction

In this era of patient-driven dentistry, it is very challenging for the clinicians, because apart from addressing biological and functional issues, they are also expected to offer treatment with satisfactory esthetics. Gingival recession presents a significant esthetic problem. Apical relocation of the marginal gingiva beyond the cemento-enamel junction is gingival recession. Based on the number of teeth involved, it is classified as localized and generalized. It could also be associated with single or more tooth surfaces. Among the population included in the epidemiological studies, more than 50% were found to have one or more sites with gingival recession. In addition, it was observed to be of at least 1 mm and buccal surfaces were more commonly involved. Higher recession sites were observed in males than females.<sup>[1]</sup> In patients with poor oral hygiene levels, the recession was observed on any tooth surfaces, whereas recession was observed commonly on buccal surfaces in patients with good oral hygiene.<sup>[2]</sup>

Gingival recession is caused due to various reasons, which include plaque-induced inflammation, trauma from improper oral hygiene practices, calculus, and high frenum attachment, from restorative iatrogenic factors, tooth malpositions, uncontrolled orthodontic movements, and improper periodontal

treatment procedures.<sup>[3]</sup> Patient experience and complain about pain due to exposure of dentinal tubules and root caries as a sequelae of gingival recession. This could also hamper the esthetic appearance, worsen the dentin hypersensitivity, and also hinder the ability to perform oral hygiene practices.<sup>[4]</sup>

Various surgical techniques that have been described to treat isolated gingival recession show a high predictability in terms of root coverage such as free gingival grafts, lateral pedicle flaps, coronally repositioned flaps, and connective tissue graft (CTG). The coronally advanced flap (CAF) is one of the most effective and simple techniques for the management of Miller Class I and II recessions because it offers excellent esthetic results, is technically simple to implement, and can be utilized for the treatment of multiple adjacent recessions.

CAF (along with CTG) was suggested to enhance the percentage of root coverage. To avoid second surgical wound site and the soft tissue harvesting, biological factors or biomaterials are being developed and used. These include enamel matrix proteins, guided tissue regeneration, acellular dermal matrices, platelet-rich plasma and fibrin, and human fibroblast dermal derivative cells.<sup>[5]</sup> Collagen membranes derived from porcine, bovine, and marine sources act as a scaffold material which has a great chance for regenerative success. Collagen Types

I and III, which are derived from porcine and bovine, are most commonly used barrier membranes. However, collagen Types I and III (porcine-derived) that are non-cross-linked could be incorporated well in the implantation bed and aid in augmentation of soft tissue.<sup>[6]</sup> This does not only induce any foreign body response but also undergoes slow biodegradation which helps in soft tissue augmentation.

Connective tissue layer encompassing the heart is the pericardium made of a simple connective tissue and squamous epithelium. Along with its constitutive cells, it is rich in collagen with majority of Type I collagen, glycosaminoglycans, and glycoproteins. The physical characteristics of the tissues of pericardium are determined by the arrangement of the collagen in different levels ranging from fibrils to laminates, fibers, and fiber bundles. This also provides a non-linear and anisotropic mechanical behavior.<sup>[7]</sup>

Here, we present a case report, in which complete root coverage was successfully achieved by CAF with Pericardium<sup>®</sup> membrane in isolated Class I Miller's gingival recession.

## Case Report

A healthy male patient aged 35 years reported to the department of periodontology, with a chief complaint of receding gums with generalized sensitivity to hot and cold. The patient was healthy with no systemic disease and no adverse habit such as smoking. On clinical examination, the patient was diagnosed with Class I



**Figure 1:** (a and b) Pre-operative recession length and recession width by UNC-15 probe



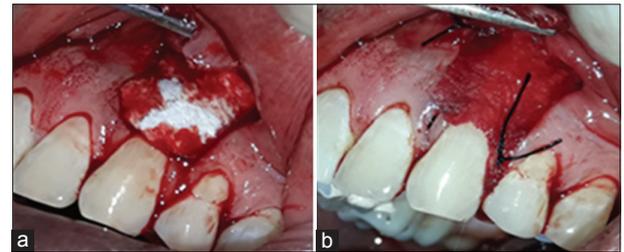
**Figure 2:** Horizontal and oblique incisions given

gingival recession in relation to 13 and 23 [Figure 1a and b]. Phase-I therapy included scaling and polishing, with gentle root planing on the exposed root surface with the Gracey curettes (Hu-Friedy). After the signature on the informed consent, the following surgical procedure was performed.

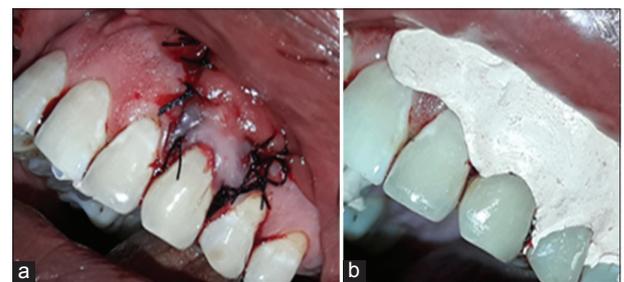
## Surgical procedure

The operative site was anesthetized using 2% lignocaine with adrenaline (1:2,00,000). At the mesial and distal line angles of the tooth, two oblique divergent incisions were given [Figure 2]. Later, intrasulcular incisions were given and this was followed by interproximal incisions. Initially, a split thickness flap was raised to move the flap coronally without tension. The root surfaces along with the most coronal alveolar bone were exposed by elevation of full-thickness mucoperiosteal flap. The Pericardium<sup>®</sup> membrane was adapted on the prepared recipient bed [Figure 3a and b]. The membrane was reshaped and trimmed to accommodate until at least 2 mm apical to bony margin. Overlying flap advanced coronally was positioned to completely cover the membrane. Sutures were placed, specifically sling sutures to attain a precise adaptation onto the tooth. Periodontal dressing (Coe-Pak) was applied over the site [Figure 4a and b].

The patient was instructed to avoid any hindrance or mechanical trauma at the wound site. Chlorhexidine solution (0.2%) twice a day was advised for 2 weeks. Ibuprofen 400 mg was prescribed 3 times a day for 5 days. At 10 days postoperatively, suture removal was done with reinforcement of oral hygiene instructions. The clinical parameters including the recession length and width were recorded at baseline, 1 month, and 3 months, respectively [Figure 5a and b].



**Figure 3:** (a and b) Flap raised and Pericardium<sup>®</sup> membrane placed, sutured



**Figure 4:** (a and b) Flap coronally repositioned and sutured and Coe-Pak placed

**Table 1:** Clinical measurements of the parameters recorded at baseline, 1 month, and 3 months

Clinical parameters	Measurements		
	Baseline	1 month	3 months
Recession length (mm)	3.5	1.0	0.2
Recession width (mm)	4.2	2.5	0.5
Width of keratinized gingiva (mm)	3.0	5.0	6.8
Pocket depth (mm)	2.0	1.5	1.5
CAL (mm)	5.5	3.0	1.7
Root coverage (%)	-	71.4%	94.2%

**Figure 5:** (a and b) Post-operative photograph at 1 month and 3 months

### Clinical observations

The surgical procedure was well tolerated by the patient. There were no visible local or systemic signs or symptoms of rejection, and pericardium was observed to be well integrated with the recipient tissues. The clinical parameters were measured thrice, at baseline, after 1 month, and 3 months, respectively. The recorded clinical parameters and their measurements are listed in Table 1. The result showed a significant reduction in length and width of recession with the use of the Pericardium<sup>®</sup> membrane. 3 months postoperatively, there was reduction in recession length, recession width, and clinical attachment level gain. The width of keratinized gingiva was also found to be increased. The patient was extremely satisfied with the final clinical outcome and appearance.

### Discussion

Root exposure as sequelae of isolated recession presents as an esthetic concern to the patient. In addition, along with these defects, dentin hypersensitivity, persisting gingival inflammation, and root caries are commonly observed. Periodontal plastic surgery is indicated in such situations for better clinical outcome and appearance. At present, there are many techniques available for root coverage such as free gingival autografts, coronally repositioned flaps, CTG, and lateral pedicle flaps. These surgical approaches were performed to attain a reduction in recession depth and gain in clinical attachment level and also to enhance the width of keratinized tissue.<sup>[8,9]</sup> Free gingival graft has, however, shown unpredictable long-term success for root coverage in terms of color match and texture.<sup>[10]</sup> Excessive tissue thickness as a result of CTG is considered as a post-operative

complication. Limitations of this technique are bleeding from the donor site and pain sensations in the palate.<sup>[11,12]</sup> Due to these restraints, like donor site morbidity and second surgical site, many biological membranes have been used within the past decades. Clinically relevant root coverage has been obtained by these membranes.<sup>[13,14]</sup>

In the present case, Pericardium<sup>®</sup> membrane was used to treat the isolated gingival recession. The membrane was found to have integrated well into the recipient tissues without complications or any allergic reactions observed. These results were similar to earlier study employing a similar human dermal-derived matrix.<sup>[14]</sup> The results (percentage of root coverage) obtained by the present membrane were found to be analogous with the current techniques. In this case report, there was an increase in the width of keratinized gingiva. The results demonstrated that pericardium showed analogous integrative capacities for soft tissue augmentation as that of other porcine-derived matrices and CTG. The used membrane could also augment the biotype by increasing the thickness of gingiva. However, long-term studies with this material are required to critically assess the potential of this new membrane as a barrier membrane.

### Conclusion

The isolated gingival recession was treated with the pericardium membrane successfully. Membrane was observed to be integrated well within the recipient's connective tissue and yielded good results. Gingival thickness and the keratinized gingival width were also increased with enhanced esthetic outcome. Overall patient's comfort and acceptance were satisfactory.

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