ECRONICON OPEN ACCESS

EC DENTAL SCIENCE
Case Report

Comparative Evaluation of Amnion-Chorion Membrane and Chorion Membrane for Root Coverage and Gingival Biotype Enhancement: A Case Report

Chaitanya Pradeep Joshi[1]*, Alisha Altaf Panjwani[1], Cynthia Bernardo D'Lima[2] and Nitin Hemchandra Dani[3]

[1]*Post Graduate Student, Department of Periodontics, MGV's KBH Dental College and Hospital, Nashik, India*

[2]*Scientific Officer, Tissue Bank, Tata Memorial Hospital and Research Centre, Mumbai, India*

[3]*Ex-HoD and Ex-Professor, Department of Periodontics, MGV's KBH Dental College and Hospital, Nashik, India*

***Corresponding Author**: Chaitanya Pradeep Joshi, Post Graduate Student, Department of Periodontics, MGV's KBH Dental College and Hospital, Nashik, India.

Received: August 26, 2017 **Published:** September 29, 2017

Abstract

Background: Myriad root coverage procedures are gaining a lot of momentum with their promising results in meeting patients' aesthetic and functional demands. However studies have proven that long term stability of recession coverage depends on improvement of gingival biotype. This case report attempts to compare the potential of human placental amnion-chorion membrane (ACM) versus chorion membrane (CM) for root coverage along with enhancement of gingival biotype.

Case Presentation: A 52-year-old male with a bilateral gingival recession in maxillary arch was treated with coronally advanced flap along with placement of amnion-chorion membrane and chorion membrane in a split mouth design. Results were evaluated for recession coverage and change in gingival biotype in millimeters (mm). Three months post-surgery, 100% root coverage was achieved at both the sides along with pronounced gingival biotype improvement from thin to thick on ACM side.

Conclusion: Due to exceptional biocompatibility and intrinsic growth factors, human placental membranes especially ACM can be an excellent alternative for root coverage and enhancement of gingival biotype.

Keywords: *Coronally Advanced Flap; Growth Factors; Platelet Rich Fibrin; Recession; Wound Healing*

Introduction

Apart from being a prime aesthetic concern, gingival recession (GR) has been associated with increased occurrence of dentinal hypersensitivity and root caries [1]. Due to its excellent predictability and long-term stability, autograft tissue still remains 'gold standard' in the world of periodontal plastic surgery [2]. However its use is limited as it significantly increases patient morbidity. Owing to this fact, there has been a constant search for a better alternative for autograft. Amnion and Chorion membranes with so many unique properties [3], including adhesive effects, bacteriostatic properties, wound protection, pain reduction and intrinsic growth factors; can prove to be a good alternative to conventional autografts.

This case report compares multiple adjacent gingival recessions treated with a combination of coronally advanced flap technique (CAF)+ACM membrane versus CAF+CM. Evidence demonstrates that thin gingival biotype in otherwise healthy mouth can maintain its position, but with even minimal irritation, it can result in more gingival recession. Thus along with the gain in gingival coverage, additional attempt was made to investigate the potential of placental membranes in improving gingival biotype over three months period. Thin-tissue biotype was defined as gingival thickness < 1.5 mm, and thick-tissue biotype as gingival thickness > 2 mm [4].

Case-Report

A 52 year-old male patient reported to the Department of Periodontology, MGV Dental College and Hospital, Nashik with a chief complaint of hypersensitivity to cold, with respect to the upper right and left front teeth region. No significant medical history was

reported. Intra-oral examination revealed multiple adjacent Miller Class-I recession with the maxillary teeth numbered 23, 24 and 13, 14,15. Gingival recessions were measured as the distance between cemento-enamel junction (CEJ) and gingival margin using periodontal probe[¥]. Gingival recession of 2 mm and 3 mm were recorded with teeth no.13, 22 and 14, 15, 23 respectively (Figure 1a and 1b). The measurement of thickness of the attached gingiva was done by transgingival probing with an endodontic reamer supplied with a rubber disc. After removal of the reamer, penetration depth was measured with a digital vernier caliper [5] (Figure 2). Oral hygiene instructions were reinforced preceded by Phase I therapy. Patient's faulty tooth brushing habit was rectified. Three weeks following etiotrophic phase, periodontal re-evaluation was done for oral hygiene maintenance. The surgical procedure was explained to the patient and an informed consent was obtained.

Figure 1: *Pre-operative view a) Right side; b) Left side.*

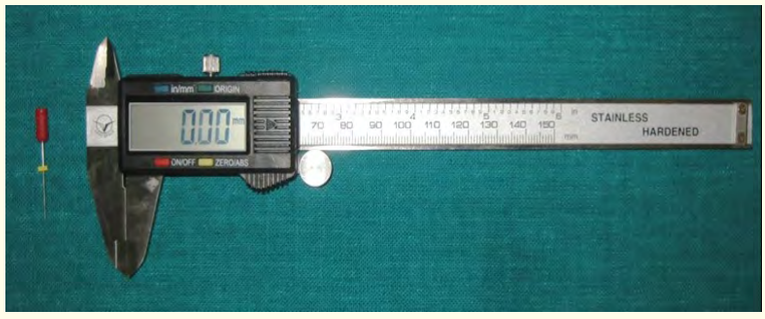

Figure 2: *Endodontic reamer and vernier caliper.*

Surgical Protocol

After providing adequate local anesthesia, two horizontal incisions were made, one papilla mesial and distal to the recession defect. Horizontal incisions were placed from the tip of the anatomic papillae equal to the depth of the recession plus 1 mm. Later, two slightly divergent vertical releasing incisions were made extending beyond mucogingival junction (Figure 3a and 3b). Full thickness flaps were elevated in the coronal–apical direction and a periosteal releasing incision was made for the ease of flap advancement. Facial aspect of the interdental papillae was de-epithelized to create connective tissue beds to suture surgical papillae of the coronally positioned flap. Exposed root surfaces were thorough root planned using curettes[¶]. Chorion[†] and Amnion-chorion[†] membranes were cut to the desired dimensions covering recession defects and then placed over the defect (Figure 4a and 4b). The flaps were coronally positioned to cover the root surface and membrane. Flaps were secured with horizontal and vertical sutures using a 4-0 non-resorbable suture (Figure 5a and 5b). A non-eugenol periodontal dressing was placed to protect the surgical site. The patient was given postoperative instructions. Medications were prescribed (500 mg amoxicillin three times daily for 5 days as antibiotic coverage and diclofenac sodium twice daily for 3 days as an anti-inflammatory and analgesic drug). From 1 day post-surgery, patient was instructed to rinse with 0.12% chlorohexidine mouthwash twice daily for 2 weeks. Seven days after surgery, the periodontal dressing was removed and the area was irrigated with normal saline. Sutures were removed 15th post-operative day. Patient was recalled after 1 month surgery and subsequently after 3 months. Clinical measurements were recorded preoperatively and 3 months postoperatively (Figure 6a and 6b).

¥ UNC-15 periodontal probe, Hu-Friedy, Chicago, IL

¶ Gracey curets, Hu-Friedy

† Tissue Bank, Tata Memorial Hospital, Mumbai, Maharashtra, India

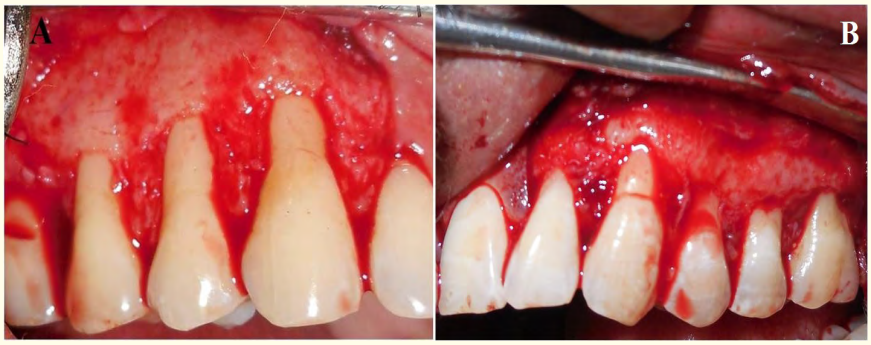

Figure 3: *Flap reflection and Root planing a) Right side; b) Left side.*

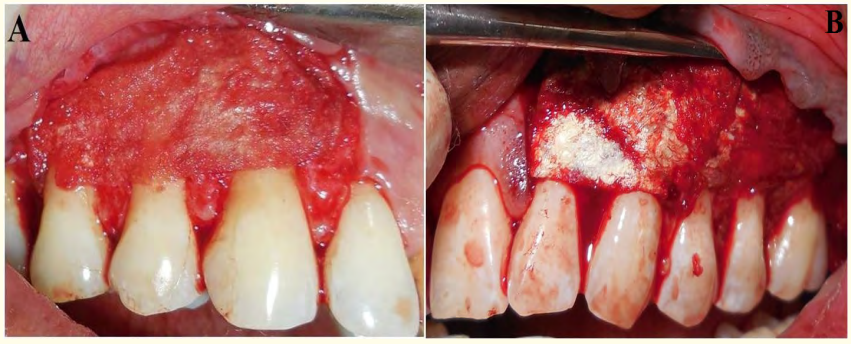

Figure 4: *a) Placement of ACM membrane over 13, 14, 15 b) Placement of chorion membrane on 22, 23.*

Figure 5: *Sutures placed a) Right side; b) Left side.*

Figure 6: *Three months Post-operative view a) Right side; b) Left Side.*

Clinical Outcomes

On both the operated sides, 100% root coverage was seen even after three months after surgery. Pre-operative gingival thickness on either treated side was 1.04 mm. Three months later, gingival thickness at CAF+ACM side was 1.46 mm whereas CAF+CM side had gingival thickness of 1.28 mm. Gingival tissues at the both sites appeared healthy, with no visible signs of inflammation.

Discussion

Placental allograft membranes which have been used in dentistry since 2008, are composed of cryo-preserved, dehydrated amnion–chorion laminate [3]. Unique properties of ACMs include presence of variety of bioactive proteins that facilitate wound healing, including collagen types I, III, IV, V, and VI, laminin-5 [6] as well as growth factors like platelet-derived growth factor-a (PDGF-a); PDGF-b, fibroblast growth factor; and transforming growth factor-b [7]. It is possible that these proteins aid in the rapid granulation covering of exposed graft, which is observed in this case report. Chorion independently is rich in collagen types I, IV,V, and VI, proteoglycans, laminin, and fibronectin. Placental allograft membranes have an advantage of being immune-privileged tissue, possessing antibacterial and antimicrobial properties, reducing inflammation and facilitating cell migration over protein rich matrix [8].

ACM or chorion need not be trimmed with exact precision for its adaptation. Presence of various adhesion molecules, such as laminins etc. make them self adherent to the surgical site [9]. Thus there was no need to suture the membrane, thus making it easier and less time consuming.

Both the placental allograft membranes were able to cover the gingival recession with 100% efficiency. Addition to gingival recession coverage, gingival biotype was also assessed because it is an important parameter in determining the long term stability of the results obtained. Thicker gingival biotype has shown to resist future recurrence of gingival recession [10]. There was a substantial difference in the post-operative gingival biotype at ACM and chorion site. ACM being bilayered and thicker than the chorion was able to convert gingival biotype from thin to thick. The results were stable throughout 3 months follow up period. Based on these results, both the placental membranes can be used as a better alternative to conventional autologous and allograft materials in the treatment of gingival recession coverage.

However, since it is a single case report and short duration of follow up, results should be interpreted with caution. Comparison with or without connective tissue graft (gold standard) with a long follow up period can be considered in future.

Acknowledgement

The authors wish to thank Mr. Pradeep K Joshi for his assistance.

Financial Support and Sponsorship

Nil.

Conflicts of Interest

There are no conflicts of interest.

Bibliography

1. Thomson WM., *et al*. "The prevalence and intraoral distribution of periodontal attachment loss in a birth cohort of 26-yearolds". *Journal of Periodontology* 71.12 (2000): 1840-1845.

2. Pini Prato GP., *et al*. "Coronally advanced flap versus connective tissue graft in the treatment of multiple gingival recessions: a split-mouth study with a 5-year follow-up". *Journal of Clinical Periodontology* 37.7 (2010): 644-650.

3. Holtzclaw DJ and Toscano NJ. "Amnion-chorion allograft barrier used for guided tissue regeneration treatment of periodontal intrabony defects: a retrospective observational report". *Clinical Advances in Periodontics* 3.3 (2013): 131-137.

4. Claffey N and Shanley D. "Relationship of gingival thickness and bleeding to loss of probing attachment in shallow sites following nonsurgical periodontal therapy". *Journal of Clinical Periodontology* 13.7 (1986): 654-657.

5. Eger T., *et al*. "Ultrasonic determination of gingival thickness. Subject variation and influence of tooth type and clinical features". *Journal of Clinical Periodontology* 23.9 (1996): 839-845.

6. Hodde J. "Naturally occurring scaffolds for soft tissue repair and regeneration". *Tissue Engineering* 8.2 (2002): 295-308.

7. Koizumi NJ., *et al*. "Growth factor mRNA and protein in preserved human amniotic membrane". *Current Eye Research* 20 (2000): 173-177.

8. Hao Y., *et al*. "Identification of antiangiogenic and anti-inflammatory proteins in human amniotic membrane". *Cornea* 19.3 (2000): 348-352.

9. Parolini O., *et al*. "Concise review: Isolation and characterization of cells from human term placenta: Outcome of the first international Workshop on Placenta Derived Stem Cells". *Stem Cells* 26.2 (2008): 300-311.

10. Kao RT and Pasquinelli K. "Thick vs. thin gingival tissue: A key determinant in tissue response to disease and restorative treatment". *Journal of the California Dental Association* 30.7 (2002): 521-526.

Volume 14 Issue 6 September 2017