

# Chorion Membrane with Tunneling Technique For Treatment of Gingival Recession

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## Abstract

Gingival recession is commonly defined as the apical migration of the gingival margin over the cement enamel junction (CEJ) with the exposure of the root surface. A variety of surgical techniques have been developed throughout the years and many studies have been carried out to evaluate these techniques with regard to their predictability and amount of root coverage achieved. The aim of the present study was to clinically evaluate the use of chorion membrane with tunneling technique approach in management of multiple gingival recession

defects as a root coverage procedure. 6 months after the surgery there was 70 % root coverage which was achieved along with gain in attachment level, reduction in recession depth, recession width, gingival index score and sulcus bleeding index score. where as in plaque index score, pocket depth and width of keratinized tissue no significant changes were observed.

## Introduction

Gingival recession is commonly defined as the apical migration of the gingival margin over the cemento-enamel junction (CEJ) with the exposure of the root surface. This feature can be found in populations with high standards of oral hygiene as well as in populations with poor oral hygiene, reaching prevalence around 51% among subjects. Gingival anatomic factors, chronic trauma, periodontitis, and tooth alignment are the primary factors, through the inflammation process, in the development of this defects.<sup>1</sup>

One goal of periodontal therapy is to regenerate the lost attachment apparatus of the teeth. It has become evident during the past decade that a variety of regenerative procedures have the potential to correct gingival recession via augmentation of the width and height of keratinized or attached gingival and obtain partial or complete root coverage.<sup>2</sup>

The main objectives of any therapeutic intervention aimed at root coverage are to restore the tissue margin to the Cemento-enamel junction and to gain an attachment of the tissue to the root surface. One problem with root coverage grafting is that an adequate supply of donor materials may not be available. Multiple sites often need grafting, but if the connective tissue supply is limited, more than one surgical procedure may be needed. Also, use of a palatal donor site can be associated with significant postoperative morbidity, particularly when large grafts are needed.<sup>3</sup>

## Case Report

A 48 year old male patient exhibiting millers class I & II gingival recession defects with a multiple site in a group of 2 to 6, were selected from maxillary arch. The selected sites were treated with placement of chorion membrane by using tunnelling technique. The selected volunteer and site were subjected to pre surgical protocol and assessment of clinical parameters pre-operatively at baseline and post-operatively at 3 months & 6 months intervals.

To reduce the measurement variations resulting from free-hand probe positioning, an occlusal stent was fabricated with cold cure acrylic resin on a dental stone model obtained from a alginate impression. The occlusal stent was made to cover at least one

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adjacent tooth in the mesial and distal direction and, extended to cover the coronal third of the tooth crown. Vertical grooves were made on the distal, mid facial and mesial line angles of the tooth on the stent to help the probe placement and penetration in the same direction while probing the pocket or recording the attachment level at the baseline and at different intervals. All the customized acrylic stents were stored on the study cast throughout the study period to minimize distortion.

Adequate local anaesthesia was obtained at the surgical site to be treated. Sulcular incisions enabled access for supra-periosteal preparation of buccal tissue using a 15C surgical scalpel blade. The incision was then extended to the adjacent tooth on both sides of the recession. The procedure was extended into the mucosal tissue using tunneling instruments, preparations were connected to each other via intrasulcular incisions. A sharp dissection of flaps used to form a partial thickness supra-periosteal envelope extending 3-5 mm laterally and apically to the areas of recession undermining the intermediate papillae. Only the papillary region was left attached. The chorion membrane was cut into desired length and width as per the defect requirement and was placed inside the tunnel and secured with 5-0 non-resorbable sutures. Periodontal pack was placed to protect the surgical site. Patient was discharged with post-operative instructions and prescription. 10 days after the surgery, the periodontal pack and sutures were removed and the surgical site was thoroughly irrigated with normal saline. Patients were then periodically monitored at 3 and 6 month after surgery. At each of the recall visits oral hygiene was assessed and oral hygiene instructions were enforced.

## Result

The mean clinical attachment level at baseline, 3 months and 6 months was  $3.42 \pm 0.75$ ,  $1.99 \pm 0.45$  and  $1.39 \pm 0.65$  respectively,

with a mean difference of  $1.43 \pm 0.56$ , ( $t=8.02$ ),  $2.02 \pm 1.02$ , ( $t=6.23$ ) at 3 months and 6 months respectively, which was statistically highly significant ( $p<0.001$ ), whereas the mean difference between 3 months and 6 months was  $0.59 \pm 0.53$ , ( $t=3.49$ ) which was statistically significant ( $p=0.007$ ).

The mean recession depth at baseline, 3 months and 6 months was  $1.95 \pm 0.70$ ,  $0.89 \pm 0.44$  and  $0.59 \pm 0.45$  respectively, with a mean difference of  $1.36 \pm 0.25$ , ( $t=6.26$ ),  $0.30 \pm 0.1$ , ( $t=2.34$ ) at 6 months & between 3 months and 6 months respectively, which was statistically highly significant ( $p=0.001$ ), ( $p=0.004$ ). whereas the mean difference at 3 months was  $1.06 \pm 0.26$ , ( $t=2.10$ ) which was statistically significant ( $p=0.005$ ).

The mean recession width at baseline, 3 months and 6 months was  $2.73 \pm 0.40$ ,  $1.81 \pm 0.25$  and  $0.99 \pm 0.44$  respectively, with a mean difference of  $0.91 \pm 0.33$ , ( $t=8.60$ ),  $1.74 \pm 0.53$ , ( $t=10.23$ ) &  $0.82 \pm 0.39$ , ( $t=6.66$ ) at 3 months, 6 months & between 3 months and 6 months respectively which was statistically highly significant ( $p<0.001$ ).

### Discussion :

Achieving predictable and aesthetic root coverage has become an important goal of periodontal therapy. In recent years, periodontal plastic surgery procedures have seen spectacular advancement and technical improvement enabling the periodontist to provide quality treatment. There are several surgical methods to treat areas of recession which can produce desired results. The various treatment options which are used to treat recession gives satisfactory results in case of root coverage but somewhere lack in maintaining the papilla height, increasing the width of keratinized gingival and adequate blood supply to the affected area.

The tunneling technique which is a modification of envelop flap was shown to be a predictable method for recession coverage with apparently satisfactory esthetic results and is relatively less invasive procedure for clinician and relatively more comfortable for patients as mentioned by Allen EP (1994)<sup>4</sup>, Allen AL (1994)<sup>5</sup>, Azzi R (1998)<sup>6</sup>, Blanes RJ (1999)<sup>7</sup>. According to Allen EP (1994)<sup>4</sup>, the tunneling technique is esthetically effective mucogingival procedure for correcting localized wide recession defects. In addition, there is no need for the second surgical site, like with free gingival graft or connective tissue graft. And this technique also maintains the papilla height, increases the width of keratinized tissue which other surgical procedures like coronally advance flap lack in them. Harris R (2005)<sup>8</sup> have mentioned that the result of this procedure have presented a percentage of root coverage varying from 75% to 95% with a mean percentage of 92.5%. currently numerous materials are available which have been used with tunneling technique for root coverage.

Papageorgakopoulos G (2008)<sup>9</sup> compared tunneling with CAF using acellular dermal matrix and has observed significant root coverage with tunneling technique using acellular dermal matrix. Thus variety of material has been used with tunneling technique with different result. But in this case report human placental chorion membrane has been used for the first time because of various

properties of membrane which makes it unique.

Collagen layers of chorion membrane are rich in type I, IV, V, VI collagen, proteoglycans, laminins and fibronectins<sup>68</sup>. these membranes possess anti-bacterial and anti-microbial properties, reduce inflammation at the wound site by the presence of natural inhibitors of matrix metallo-proteins-1,2,3,4, interleukin-10 and interleukin-1 receptor antagonist, causes suppression of interleukins  $1\alpha$  and  $1\beta$ . hyaluronic acid present in the chorion membrane causes entrapment and adhesion of inflammatory cells including lymphocytes. The membrane also expresses microbial peptide like  $\beta$ -defensins<sup>70</sup> and produce elastase inhibitors like secretory leucocyte proteinase inhibitor and elafin. The placental membranes have been used in past as a surgical wound dressing, sinus wall repair and many other conditions.

There is paucity in literature regarding the use of chorion membranes in the of periodontics. Favorable results have been found with these membranes by Esteves J et al (2015)<sup>10</sup> in root coverage procedure, Holtzclaw Jd (2013)<sup>11</sup> in treatment of intrabony defects, Kothiwale Sv (2014)<sup>12</sup> in periodontal pocket management, Holtzclaw Jd (2015)<sup>13</sup> in maxillary sinus wall repair. Thus based on the properties of chorion membrane this study was conducted to evaluate the clinical efficacy of chorion membrane with tunneling technique in root coverage for multiple recession defects.

In this present case report there was a statistically significant mean gain in clinical attachment level at three and six months post-operatively from the baseline. This was in accordance with the study done by Ozenci I et al (2015)<sup>14</sup>.

In this present case report there was a statistically significant mean reduction in recession depth at three months and six months post-operatively from the baseline. This was in accordance with the study done by Ozenci I et al (2015)<sup>14</sup>.

In this case report there was a statistically highly significant mean reduction in recession width at three months and six months post-operatively from the baseline. This was in accordance with the study done by Ozenci I et al (2015)<sup>14</sup>.

### Conclusion

The present case report concludes that the use of chorion membrane with tunneling technique in the treatment of multiple recession defects has shown promising results, with 70 % of root coverage 6 months post-operatively, with satisfactory gain in clinical attachment level, reduction in recession width and recession depth. Significant reduction was also seen in gingival index score and sulcus bleeding index score.

The present case study also concludes that chorion membrane is bio-compatible and non-allergic and it also favors the regeneration of the periodontal tissues.

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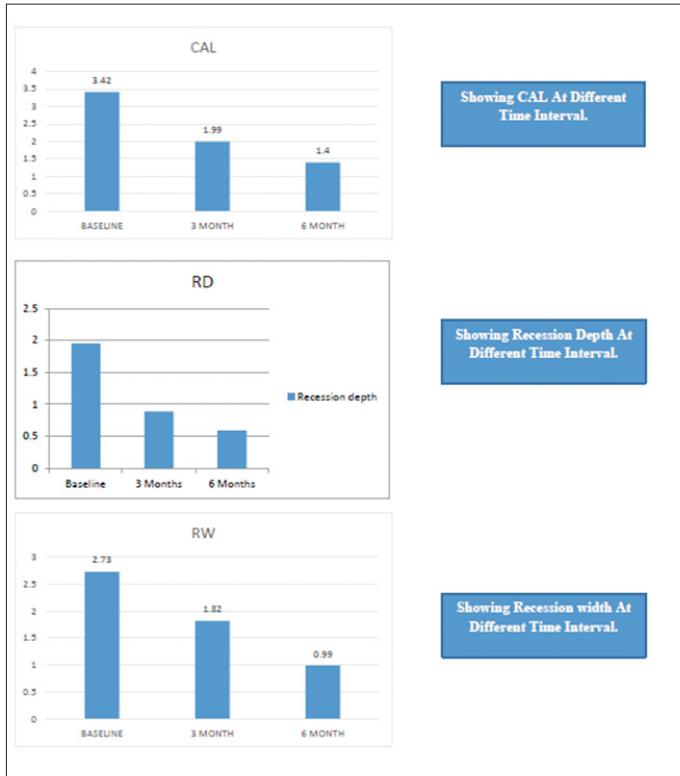
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**ARMAMENTARIUM**



**CHORION MEMBRANE**

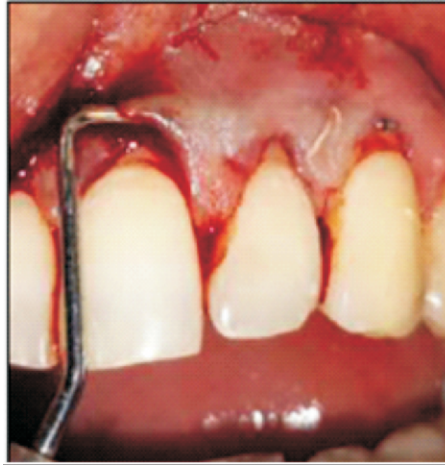


**SULCULAR INCISION**





SEPERATING PERIOSTEUM WITH ORBANS KNIFE



TUNNEL FORMED



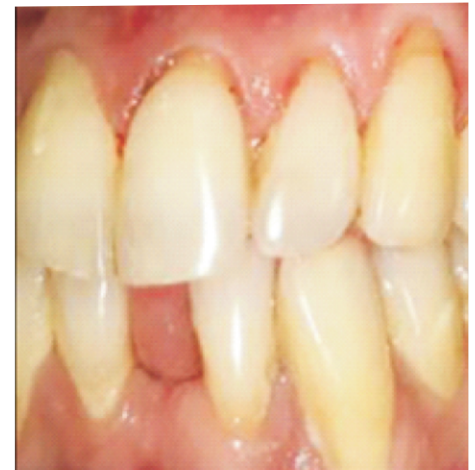
PRE SUTURING WITH CHORION MEMBRABE



SUTURING DONE



CO-PACK PAGED



GINGIVAL RECESSON AT BASELINE



GINGIVAL RECESSON AT 6 MONTH