CASE REPORT

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MINIMALLY INVASIVE GINGIVAL RECESSION TREATMENT BY USING VISTA COMBINED WITH PRF AND COLLAGEN MEMBRANE: A CASE REPORT

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Abstract. *Root exposure generates major concerns regarding aesthetics and other problems like hypersensitivity and root caries. Gingival recession has traditionally been treated by periodontal plastic surgery, often using soft tissue grafts to fill the defect with excellent clinical results. Advancements in root coverage procedures in the aesthetic zone have led to increasing the ability of clinicians to harness a treatment modality that delivers better outcomes with less surgical morbidity. Collagen membrane is most commonly used for guided tissue regeneration (GTR). On the other hand, platelet-rich fibrin (PRF) has gained popularity due to its simple method of acquisition, low cost and the presence of growth factors. Therefore, this case report describes the treatment of a 38-year-old patient with bilateral multiple Miller's class I recession defects extending from central incisors to canines by using the vestibular incision subperiosteal tunnel access (VISTA) with PRF and collagen membrane. Clinical parameters such as recession height (RH) and width of keratinised gingiva (WKG) were measured at 6-month and 1-year follow up intervals. The 6-month follow-up revealed optimum root coverage with excellent outcomes for both sites, with an increase in the width of keratinised gingiva and a decrease in the recession height, and less discomfort in the site treated with a PRF membrane. These clinical parameters were maintained at the 1-year follow up. The increase in the width of keratinised gingiva and the decrease in the recession height in both groups and the patient compliance due to this minimally invasive procedure suggests its potential use when aesthetics and patient comfort are of paramount concern.*

Key words: *platelet-rich fibrin, gingival recession, VISTA, collagen membrane*

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INTRODUCTION

The primary objectives of periodontal treatment have historically been eradication of the disease and preservation of healthy supporting tissues. The apical migration of the gingival margin, which affects a substantial part of the population, is one of the most prevalent cosmetic issues related to periodontal tissue that results in hypersensitivity, aesthetic concerns and carious or non-carious lesions by the root exposure [1]. Aetiologic factors that can lead to this common problem are recognised to be either anatomical, such as thin gingival biotype, abnormal tooth positioning (too buccally or lingually), aberrant frenal attachment, or iatrogenic, such as tooth brush trauma, subgingivally extending restorative margins, the presence of an inflammatory process such as peri-

odontal disease due to poor oral hygiene, inadequate crown emergence angles [2, 3].

Management of gingival recession includes identification and removal of susceptible factors followed by non-surgical and/or surgical treatment. The primary goal of any surgical approach introduced is to achieve complete root coverage and regeneration of periodontal supporting tissue that help improve aesthetics. During the past few decades, many techniques such as coronally advanced flap, pedicle flap, subepithelial connective tissue graft, free gingival graft have been introduced to treat recession defects with optimum results [4]. Numerous research initiatives have been conducted to develop minimally invasive root coverage approaches that are also aesthetically appealing, due to the increased risk of damaging the tissue and unfavourable healing. In 2011, Zadeh developed the VISTA procedure, which involves a vestibular incision and the use of special instruments to access multiple adjacent recession defects and reposition the gingiva coronally.

Since 1985, subepithelial connective tissue grafting (SCTG) for root coverage has resulted in reproducible and predictable outcomes [5]. Guided tissue regeneration (GTR) is a viable alternative to the soft tissue grafting approach. Initially, the non-bioabsorbable membrane was used by clinicians, but the second surgical intervention for its removal made the bioabsorbable membrane more promising. The most commonly used biodegradable membrane is the collagen membrane that helps preventing apical downgrowth of the gingival epithelium and promotes regeneration of the supporting periodontium [6]. What intrigues more, is its haemostatic activity and other properties for enhancing fibrin linkage, attraction and activation of gingival fibroblasts and periodontal ligament cells, stabilisation of wounds [7].

Platelet-rich fibrin (PRF) is a second-generation autologous fibrin gel. The formation of A-PRF is based on the concept of low-speed centrifugation with enhanced time period. In comparison with L-PRF, it has high concentration of growth factors with 65% of leukocytes. The use of PRF has gained popularity due to its low cost and simple acquisition [8].

The present case report describes the treatment of Miller's class I bilateral recession extending from central incisors to canines by using the VISTA technique and a collagen membrane or a PRF membrane on either side. Clinical parameters such as recession height and width of keratinised gingiva were evaluated at 6-month and 1-year follow-up intervals.

THE CASE REPORT

A 38-year-old patient visited the Department of Periodontology with main complaints of sensitivity to cold water and breeze in the upper anterior teeth and an unaesthetic appearance. Miller's class I recession defect was identified bilaterally, extending from the central incisor to the canine (Fig. 1). Before starting the procedure, the patient's written informed consent was obtained. Thorough scaling and root planing were performed prior to surgery.

The sites with bilateral Miller's class I gingival recession defects were treated in the Department of Periodontics at A B Shetty Memorial Institute of Dental Sciences, Deralakatte, Mangalore.

The sites were divided into two treatment modalities: site 1 was treated with VISTA + a bioresorbable collagen membrane (Bio-Gide) (Fig. 2) and site 2 was treated with VISTA + A PRF membrane (Fig. 3). The VISTA procedure was performed through a vertical incision by using special instruments (Fig. 4).

Fig. 1. Gingival recession involving the right and left maxillary anterior teeth in relation to 11, 12, 13, 21, 22, and 23

Fig. 2. The Bio-gide collagen membrane

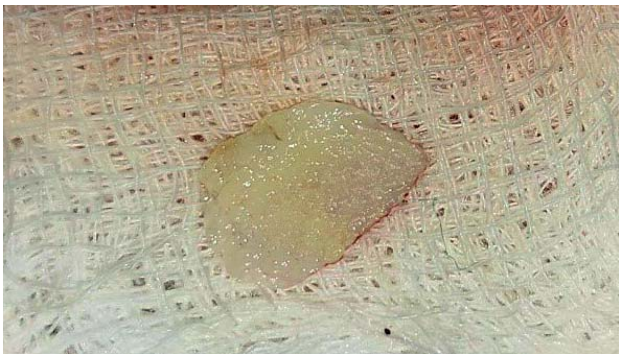

Fig. 3. The PRF compressed to form a membrane

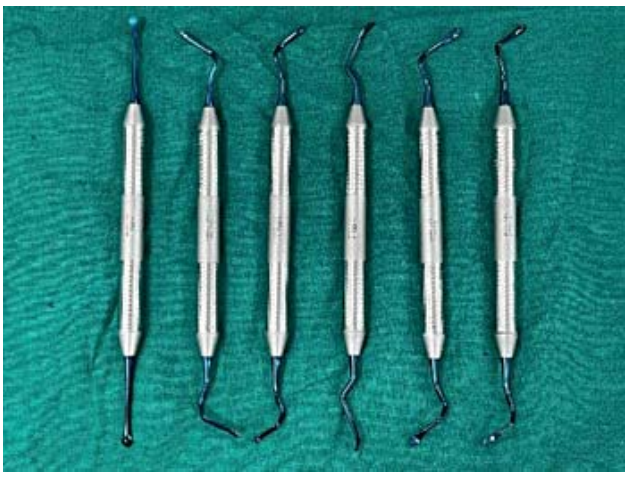

Fig. 4. The VISTA instruments

PRF procurement

10 ml of venous blood was obtained from the patient and collected in a glass test tube with no anticoagulants. The test tube was then placed in a centrifugal machine for centrifugation at 1,500 rpm for 14 minutes. After completion of the PRF processing, 3 centrifugation strata were obtained with a top layer of acellular plasma, a middle layer of fibrin clot and a bottom layer of red blood cells (Fig. 5).

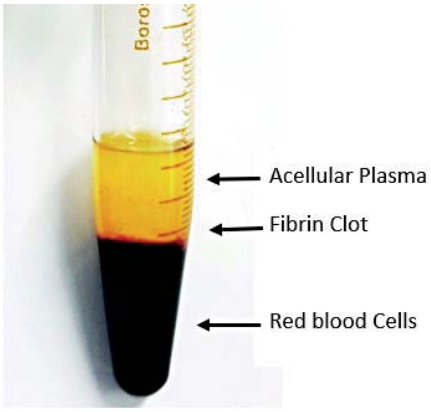

Fig. 5. Centrifugation strata of the PRF

Surgical technique

Following oral disinfection with betadine, the surgical sites were anaesthetised by using local anaesthesia. The recipient site preparation was the same for both sites with recession defects and was accessed through a single vestibular incision on the maxillary buccal frenulum. Subperiosteal tunnelling was performed with the VISTA 1 periosteal instrument, and VISTA 2 and 3 instruments were used to facilitate the access through the gingival sulcus and interproximal areas to the extent permitted by the embrasure space. The tunnelling was extended beyond the mucogingival junction for proper coronal advancement of the gingiva (Fig. 6).

The A-PRF membrane was freshly prepared and trimmed, then inserted through the subperiosteal tunnel over 11, 12 and 13 and stabilised at place by gentle pressure for 3 minutes (Fig. 7).

The site in relation to teeth 21, 22, 23 was measured using a surgical template and a bilayer collagen membrane (Bio-Gide) was trimmed to the appropriate size. The collagen membrane was then introduced through the subperiosteal tunnel and secured in place using the lasso suturing method (Fig. 8).

Coronally anchored suturing technique was used to coronally reposition the gingival margin at 2 mm beyond the cementoenamel junction (Fig. 9). Each tooth was etched and the suturing was done using horizontal mattress suture spanning the width of the tooth. Simple interrupted suture was made to approximate vestibular incision. The patient was recalled after 3 weeks for suture removal.

The patient was recalled 3 weeks after the surgery and no visible signs of inflammation or discomfort were reported. The patient was followed-up at 6-month and 1-year intervals. Root coverage with gain in the clinical attachment level was observed in both sites treated with VISTA + A PRF membrane

Fig. 6. Right and left subperiosteal tunneling

and VISTA + a collagen membrane (Bio-Gide). The increase in the width of keratinised gingiva and the decrease in the recession height were significant when compared from baseline to 6 months. These clinical parameters were maintained at the 1-year follow up (Fig. 10a, 10b, 11a, 11b).

Fig. 7. Insertion of the PRF membrane

Fig. 8. Insertion of the collagen membrane

Fig. 9. Gingival margin coronally advanced and anchored, and bonded to each tooth.

Fig. 10a. Pre-surgery

Fig. 10b. One year post-surgery

Fig. 11a. Pre-surgery

Fig. 11b. One year post-surgery

DISCUSSION

During the past few decades, extensive research has taken place for gingival recession treatment to find aesthetically superior and minimally invasive techniques achieving the primary objectives of complete root coverage and regeneration of lost periodontium. VISTA is a minimally invasive technique, which was first introduced by Dr. Zadeh [9]. This technique facilitates the access to adjacent gingival recession defects and the coronal advancement of gingival sulci by using a vestibular access incision and subperiosteal tunnelling.

Although subepithelial connective tissue grafting is the gold standard, this procedure also possesses some limitations in terms of technique sensitivity, involvement of two surgical sites, patient acceptance, and donor site tissue morbidity. Therefore, GTR was introduced to overcome the limitations of SCTG.

A comparative study between SCTG and collagen membrane for the treatment of gingival recession reported similar results with SCTG = 95.6% and GTR = 84.2% (P = 0.073) of mean root coverage. Reduction in probing depth (PD) was measured to be more in subjects with GTR membrane [10].

A randomised clinical trial on PRF and SCTG for the treatment of adjacent gingival recession defects reported complete root coverage of 50% and 60% 6 months after surgery in the groups, respectively. Within the limitations of the study, the author suggested the PRF to be a viable alternative to the SCTG [11].

This case report describes the split mouth VISTA technique with the use of a collagen membrane and a PRF membrane for the treatment for adjacent gingival recessions. Both the A-PRF and the collagen membrane (Bio-Gide) produced a significant amount of root coverage, thus encouraging their use in patients who are unwilling to undergo soft tissue grafting. However, the A-PRF has shown an increase in gingival thickness as compared to the collagen membrane. This can be due to the influence of growth factors in the fibrin matrix and the property of fibroblast proliferation in the connective tissue and periodontal ligaments over a relatively longer time period [12]. On the other hand, collagen membrane tends to collapse against the root surface resulting in difficulty to achieve space preservation [13].

CONCLUSION

In the world of diversity in the treatment options for localised or multiple gingival recession, the VISTA approach has provided a minimally invasive technique to address multiple adjacent gingival recession defects, while the A-PRF and collagen membrane manifesting equally significant outcomes have potentially addressed the limitations with the use of subepithelial connective tissue grafting. Long-term clinical trials with large samples are needed to confirm the potential of A-PRF and collagen membrane in the procedure for root coverage.

Conflict of interest: *There is no conflict of interest.*

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