

Sticky Bone for Space Maintenance in the Treatment of Miller's Class I Gingival Recession Defects with VISTA Technique: A Case Series

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Abstract- Background: Obtaining predictable root coverage has become an important part of periodontal therapy. Various GTR techniques are explored for treating a gingival recession defect. Since soft tissue follows the contour of the hard tissue, sticky bone can be a useful tool to obtain better root coverage results, maintain space, and act as a scaffold between soft tissue and root surface.

Methods: In this case series, 2 cases were approached with VISTA technique for coverage of multiple Miller's class I defects. Sticky bone (i-prf and DMBM) was introduced into the defect area to act as a scaffold and maintain space.

Results: Clinically significant amount of root coverage was obtained in both cases. 91 percent of root coverage was obtained with the first case whereas 78 percent of coverage was seen with the second case.

Conclusion: Results from these case reports indicate that the introduction of sticky bone into recession defects helps in getting tangible results.

I. INTRODUCTION

Gingival recession is fairly common and its prevalence increases with age. The gingival recession which might be localized or generalized, can affect one or more surfaces, exposing roots and causing clinical issues including root surface hypersensitivity, root caries, cervical root abrasions, problematic plaque control, and a loss of esthetic/cosmetic appeal. ⁽¹⁾ Root coverage has been achieved using pedicle flaps, non-contiguous grafts, and combination operations such as subepithelial connective tissue grafts. Although all of these methods can provide consistent root coverage, healing results in the creation of a long junctional epithelium (LJE) or a LJE with limited connective tissue attachment. There is very minute or no new cementum or bone generated with subepithelial connective tissue grafts. ⁽²⁾ Following the application of guided tissue regeneration (GTR)-based root covering methods, histological studies revealed considerable bone, cementum, and connective tissue attachment. ⁽¹⁾ When nonabsorbable barriers were used, this method was found to be predictable. Furthermore, GTR has the potential to result in the creation of new attachments (new bone, new

cementum, new periodontal ligament, and new connective tissue). It also provides an infinite supply of materials and eliminates the requirement for a second surgical site for donor tissue harvesting. All GTR treatments, including root covering techniques, rely on the capacity to establish and maintain space between the root surface and the underlying GTR barrier. This space is thought to be required to allow progenitor cells to migrate toward and onto the detoxified root surface, where they can differentiate into cementum and periodontal ligament-producing cells. Unfortunately, it is difficult to achieve space maintenance when treating recession defects because the membrane tends to collapse against the root surface. ⁽²⁾ It is claimed that using autologous blood concentrates improves tissue regeneration and repair. Sticky bone made from injectable platelet-rich fibrin (i-PRF) and bone graft works as a scaffold and offers mechanical support, encasing the graft, platelets, and leukocytes in fibrin interconnectivity that also resists soft tissue ingrowth. ⁽³⁾ The sticky bone was prepared with Demineralized bovine matrix (DMBM) graft material in all the cases presented. DMBM is a bovine-derived xenograft material that has osteoconductive properties.

In this case series we further explore the effectiveness of sticky bone as a scaffold in Miller's class I gingival recession defects treated with VISTA technique of recession coverage.

II. CASE 1

A 35-year-old patient visited us with a chief complaint of sensitivity in the upper left back tooth region. The patient was in good health, non-smoker, with no contraindications for surgery. Periodontal examination revealed no pockets in any location. Miller's class I gingival recession was observed on teeth 24, 25, and 26. A recession depth of 5 mm was seen with 26, 3, and 2 mm with 25 and 24 respectively. (Figure 1)

Vestibular incision sub-periosteal tunnel access (VISTA) technique of root coverage with sticky bone and collagen membrane was planned for this case. The VISTA approach began with a vestibular access incision which provided access to the entire recession area. First, a full-thickness 8–10 mm vertical incision was given in the vestibule mesial or distal to the surgical site away from the gingival margin and served as a door for extension of the subperiosteal tunnel. A subperiosteal tunnel was created by inserting a periosteal elevator between the periosteum and bone through the vestibular access incision. The gingival margin was mobilized to facilitate coronal repositioning. (Figure 1.2)

III. PREPARATION OF STICKY BONE (I-PRF + DMBM)

i-PRF (700 rpm, 3–4 min centrifugation time) was prepared in a plastic tube by using 10 ml of the patient's venous blood. It was then mixed with DMBM and allowed 5–10 min for polymerization, to acquire a well agglutinated sticky bone. (Figure 1.3)

The prepared sticky bone was then introduced into the recession area underneath the mobilized tissue. Later collagen membrane was covered over the grafted site. (Figure 1.4) The tissue was coronally advanced and sutured with 3-0 Vicryl. (Figure 1.5) Periodontal pack was then placed. Suture removal was done after 10 days. At 3 month evaluation, there was 91% root coverage was observed. (Figure 1.6)

IV. CASE 2

Case 2 was a 32-year-old male patient who presented with Miller's Class I recession defects ranging from 3 mm to 4 mm with 11, 12, and 13. The technique used in this recession coverage is similar to that of the previous case. (Figure 2) The only difference is that the collagen membrane was not placed in this case. Suture removal was done after 10 days. At 3 month evaluation, there was 78% root coverage observed. (Figure 2.2)

V. DISCUSSION

Bone dehiscence occurs simultaneously with soft tissue loss in a gingival recession, making restoration difficult since soft tissue follows the location and structure of the underlying hard tissue passively. The positive outcome in this case series can be attributable to the combination of sticky bone and appropriate recession covering procedures, which maximized regeneration effects. Filling the dehiscence location with sticky bone creates a good scaffold for the osteoconductive and osteoinductive activity to occur faster.

The minimally invasive VISTA technique described in these case reports, when paired with platelet-derived growth factor, has several distinct advantages for treating various recession abnormalities. ⁽⁴⁾ The VISTA procedure rectifies some of the limitations in intrasulcular tunneling procedures for periodontal root coverage. The gingiva of the teeth being treated is less likely to be traumatized because of the distance incision. Chatterjee A et al ⁽⁵⁾ in their case series reported excellent results with this VISTA technique of recession coverage.

The gel-like consistency of sticky bone makes it moldable and enhances the handling as well as prevents its dispersion. The liquid form of PRF is known as injectable PRF (I-PRF). I-PRF is a bioactive substance that can stimulate tissue regeneration and is obtained through low-speed centrifugation. PRF may promote the release of many growth factors and cause fibroblast migration at high concentrations. I-PRF is commonly utilized in regenerative medicine, with positive results. ⁽⁶⁾

Studies on the efficacy of GTR have shown predictability with the use of a collagen membrane. Collagen is semipermeable, allowing nutrient passage and gas exchange, and it supports cell proliferation via its lattice-like structure and cell-binding domains. Collagen membrane since it acts as a barrier membrane, stops the inward growth of soft tissue into the grafted area. This may explain to us the better result obtained in case 1 where we obtained 91% root coverage when compared to case 2 where we obtained only 78%.

Both the cases showed excellent results with more than 90% of root coverage seen with both recession defects. Similar results were seen in a study done by Bhargavi P K et al.⁽³⁾ In their study they treated recession defects with sticky bone from FDBA and i-prf. A conventional full-thickness flap was raised in the treatment. 93% root coverage was obtained in this study. In the present case series, the VISTA approach further gives an advantage over any conventional flap approach. Furthermore, space maintenance has been shown to be critical to the overall regenerative attempt. The sticky bone which was used in these cases acts as an excellent space maintainer and further aids in regeneration of bone and helps in better outcome to any recession coverage procedures.

VI. CONCLUSION

In conclusion, results from these case reports indicate that the introduction of sticky bone into recession defects helps in getting excellent results. There is certainly scope for further studies into this technique with larger samples and/or comparative studies for a better understanding of the results.



Figure 1: Class I recession irt 24,25,26



Figure 1.4: Sticky bone and collagen membrane placed

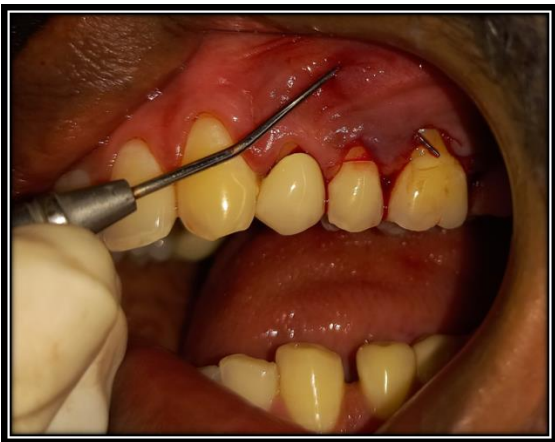


Figure 1.2: VISTA approach



Figure 1.5: Vicryl sutures placed

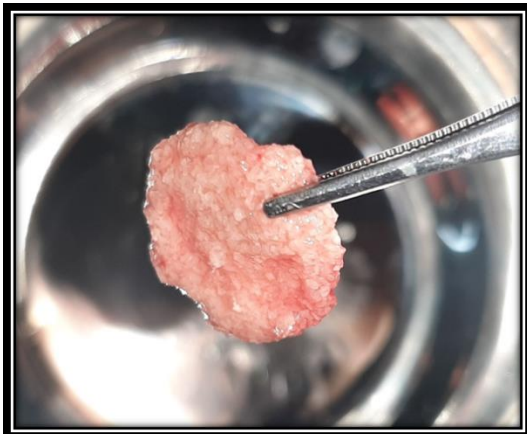


Figure 1.3: Sticky bone



Figure 1.6: 3-month evaluation



Figure 2: Pre-op case 2



Figure 2.1: Placing of sticky bone



Figure 2.2: Case 2 re-evaluation

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