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Case Report

The Vestibular Incision Subperiosteal Tunnel Access (VISTA) for Treatment of Maxillary Anterior Gingival Recession Defects- A Case Report

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ABSTRACT

Gingival recession is referred as apical shift of the gingival margin leading to the exposure of root surface to oral cavity. AAP defines marginal tissue recession as displacement of soft tissue margin apical to CEJ. It is considered a mucogingival condition that can constitute important aesthetic and functional problems and its treatment is a major challenge in periodontal therapy. A variety of therapeutic options are available for the treatment of such gingival recession, however, the primary indications of root coverage by surgery are mainly esthetic. Limitations of the currently available techniques include the need for harvesting of autogenous donor tissues and their associated morbidity, as well as scar formation at the recipient site resulting from surface incisions. Moreover, muscle pull during healing often leads to incomplete coverage or relapse of the recession. The vestibular incision subperiosteal tunnel access (VISTA) technique offers a minimally invasive approach for the treatment of multiple recession defects, also it allows for the fixation of gingival margins, thereby preventing its apical relapse in the initial stages of healing. This case report describes the VISTA technique for the treatment of Millers Class I recession defects.

Keywords: Gingival recession, VISTA

INTRODUCTION

Marginal tissue recession i.e. displacement of soft tissue margin apical to cementoenamel junction with the exposure of root surface is a common feature in populations with high standards of oral hygiene (Sangnes and Gjermo 1976, Murtomaa et al 1987, Loe et al 1992) as wellas in populations with poor oral hygiene (Baelum et al 1986, Yoneyama et al 1988, Loe et al 1992). [1]

Tissue trauma caused by vigorous tooth brushing is considered to be predominant causative factor for the development of recessions particularly in the young individuals. [1] Traumatizing tooth brushing and tooth malposition are the factors frequently associated with marginal tissue recession. Recessions are also related to the use of hard tooth brushes. [1] Other local factors associated with marginal tissue recession include, alveolar bone dehiscences, high muscle attachment and frenal pull, plaque and calculus, and iatrogenic factors related to restorative and periodontal treatment procedures. [1]

An array of therapeutic options is available for treatment of gingival recessions. However, the choice of one surgical technique over other depends upon, local anatomical conditions of the site to be treated, other treatment objectives apart

from root coverage procedures that are to be achieved, the need to satisfy patients esthetic demands. [2] Of all the available techniques, although considered the current gold standard, the CTG presents a number of disadvantages, including the need for harvesting a distant donor site, limited tissue availability, and increased potential for postharvesting morbidity. [3]

Such therapeutic challenges become even greater when clinicians confront multiple contiguous recession defects, where issues of limited tissue availability and post harvesting morbidity are magnified. In the tunnel technique for the treatment of multiple adjacent gingival recession, envelopes are prepared for each tooth as done in the envelope technique, however the lateral split incisions are extended so that the multiple envelopes are connected mesially and distally to form a mucosal tunnel. The graft is positioned inside the tunnel and its mesial and distal extremities are sutured with two interrupted sutures. Sling sutures may be placed to advance the mucosal flap coronally over the exposed portions of the connective tissue graft. [1]

In the light of aforementioned limitations, the method of GTR (guided tissue regeneration) [4] with biodegradable and non-biodegradable membranes and biologically active substances such as acellular dermal matrix allograft (ADR), [5] enamel matrix derivative (EMD), [6] Platelet rich plasma (PRP), [7] platelet rich fibrin (PRF) [8] and more came into being.

In 2011 Zadeh H H. [3] modified the tunnel technique offering the so called VISTA (Vestibular incision subperiosteal tunnel access) technique for the treatment of multiple adjacent gingival recessions in the front part of maxilla. VISTA involves making an access incision in the maxillary anterior frenum, followed by elevation of subperiosteal tunnel. [3] This incision can also be made in areas other than the frenulum of the maxilla or mandible. [9] It also involves stabilization of the gingival margins, referred to as coronally anchored suturing, so as to promote healing by preventing micromotion, one of the major obstacles in healing. The current case report describes treatment of Millers Class I defects in maxillary anterior region using the Vestibular incision subperiosteal tunnel access (VISTA) in combination with PRF membrane.

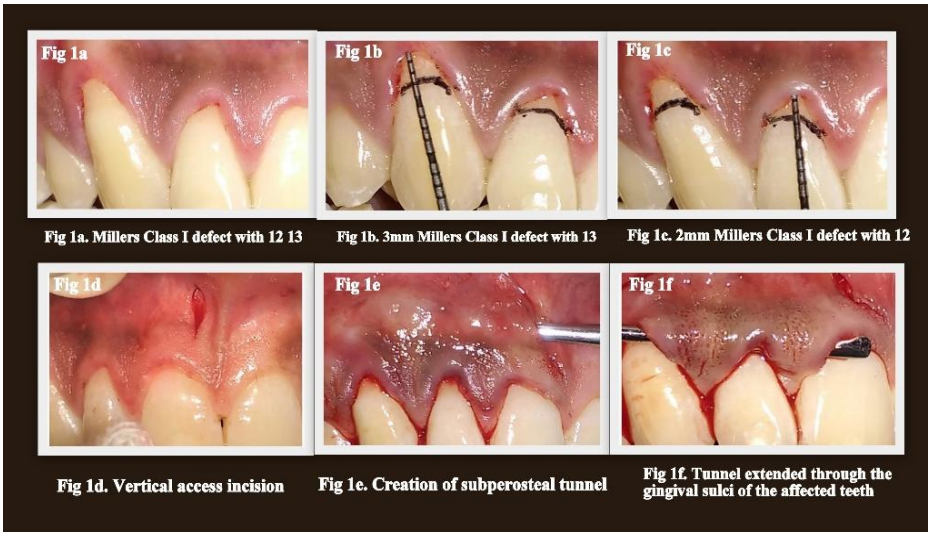
CASE REPORT

A 30-year-old male reported to the Department of Periodontics of SMBT Dental College and Post Graduate Research Centre, Sangamner, with a chief complaint of poor aesthetics resulting from exposed root surfaces in upper right front region of jaw. Thorough clinical examination revealed, Millers class I defect (3mm) with Maxillary right canine and Millers Class I defect (2mm) with maxillary right lateral incisor (Fig 1a, Fig 1b, Fib 1c). Clinical examination included recording patient's smile line. Smile line was analysed according to smile line classification given by Libert et al. The patient had high smile line. Considering the patient concern about his esthetics and conscious smile root coverage procedure was planned. Patient was in good general health, blood investigations, medical history showed no contraindications for the surgery. All the available surgical procedures and the percentage of root coverage expected over variable period of time were explained to the patient. After obtaining written informed consent, Vestibular incision subperiosteal tunnel access technique was planned for root coverage.

Initial preparation of recipient teeth included thorough scaling and root planning. The root surfaces were then conditioned for 2 minutes with 10% EDTA to eliminate the smear layer. Complete aseptic precautions were taken while performing the surgical techniques. Standard skin preparations using 10% povidone iodine solution was carried out. About 2 ml of anaesthetic solution Lignox® (2% lignocaine with 1:80,000 adrenaline)

was administered as nerve block and/or infiltration.

In the VISTA approach a vertical access incision was made using No.15 blade, close to the midline frenum (Fig 1d). The incision was made through the periosteum so as to facilitate elevation of subperiosteal tunnel and exposure of the facial osseous plate. A microsurgical periosteal elevator was used to create the subperiosteal tunnel (Fig 1e). The tunnel was extended one or two teeth beyond the teeth being treated to mobilize gingival margins and facilitate coronal repositioning. Additionally the subperiosteal tunnel was extended well beyond the mucogingival margin, through the gingival sulci of the teeth being augmented so as to allow low tension coronal repositioning of the gingiva (Fig 1f). Also the tunnel elevation was extended interproximally under each papilla as far as the embrasure space permits, without making any surface incisions through the papilla (Fig 1f).

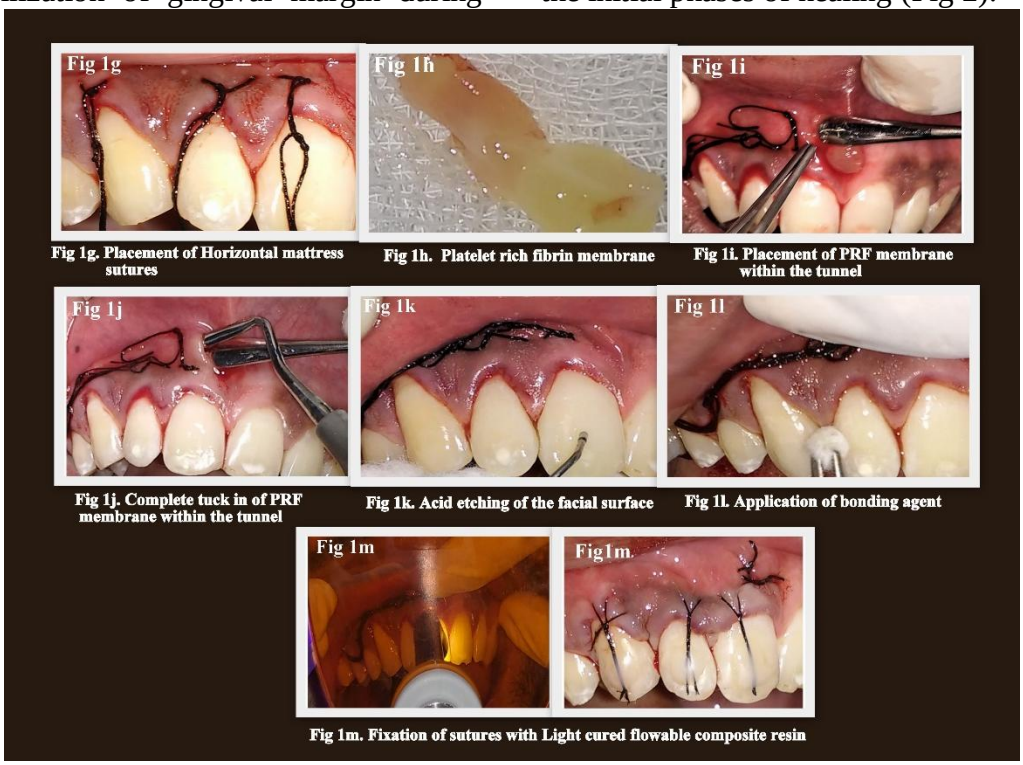


Single horizontal sutures were made 2-3 mm apical to the gingival margins in the area of the affected teeth (Fig 1g).The prepared PRF membrane was placed within the tunnel through the vertical access incision (Fig 1i). Microsurgical periosteal elevator was used for the placement of PRF membrane.

The horizontal sutures were knotted. The knots were placed such that they could be fixed onto the midcoronal point of the facial surface of the affected teeth so as to facilitate low tension coronal repositioning of the gingival margins. Each tooth was then prepared for attachment of the suture to the tooth. The facial enamel surface was acid etched for less than 5 seconds, thoroughly washed and dried. The gingival margin was advanced coronally to the most coronal level of the interproximal papillae. Fixation of sutures can be done either on the facial, lingual or the palatal surfaces of the tooth. In this case, sutures were fixed onto the facial surface of the affected teeth using light cured flowable composite resin (Fig 1m). If excessive tension is detected during coronal repositioning, the subperiosteal tunnel can further be elevated in all directions to facilitate mobilization of gingival margins. The midline access incision was then approximated and sutured with multiple sutures. 5-0 black silk sutures were used for suturing (Fig 1m).Postoperatively patient was prescribed with NSAIDs (Dolostat SP) for pain management. Postoperative maintenance with 0.12% solution of chlorhexidine rinsing one minute three times a day was advised for 14 days. Patient was recalled after one week.

Sutures at the access incision were removed after 1 week. Coronally anchored bonded sutures were removed at 2 week postoperative visit so as to facilitate

immobilization of gingival margin during the initial phases of healing (Fig 2).



At 1 week and 2-week postoperative visit, healing was uneventful with no postoperative complications. The percentage root coverage obtained at 1 month was 83% with canine and 100% with lateral incisor. The results were maintained at 6 month postoperative visit (Fig 3b).

RESULTS

The percentage root coverage obtained at 1 month postoperative visit was 83% with canine and 100% with lateral incisor. These results were sustained at 6months postoperative visit. The results were excellent as perceived by the patient.

DISCUSSION

Gingival recession is considered a mucogingival condition that can constitute important aesthetic and functional problems. The significance of any marginal tissue recession may vary considerably depending on etiology, extent and associated symptoms. Gingival recession defects presents clinicians with significant therapeutic challenges, including restoration of protective anatomy of the mucogingival complex, reestablishment of the esthetic balance between soft tissues and adjacent tooth structures, and ideally, regeneration of the lost cementum, periodontal ligament and supporting alveolar bone. [3] Such therapeutic challenges become even greater when clinicians confront multiple contiguous recession defects, where issues of limited tissue availability and post harvesting morbidity are magnified. [3] In order to minimize the surgical procedures

and optimize the aesthetic results all adjacent gingival recessions should be treated in a single treatment stage. [2] The minimally invasive VISTA technique presented in this case report combined with the use of PRF membrane affords a number of unique advantages to the successful treatment of multiple recession defects. The vertical access incision used in VISTA technique is broader, this single vestibular incision provides access to an entire region, including visual access to the underlying alveolar bone and root dehiscences. [3] Also this access incision being made away from the area of affected teeth, reduces the possibility of traumatizing the gingiva of the teeth being treated. [3] Tunnel preparation well beyond the mucogingival junction facilitates the low tension coronal positioning of the gingival margins. One of the important technical difference between VISTA and other tunnelling techniques is the degree of coronal advancement of the gingival margins achieved during the procedure. [3] As described above, the gingival margin is advanced to the most coronal level of the adjacent interproximal papillae rather than to the cementoenamel junction. Also in VISTA technique, no surface incisions are made through the interdental papillae thereby maintaining the anatomical integrity of the interdental papillae. [3] Considering the blood supply and esthetics a vertically oriented incision is less likely to disrupt the blood supply than the horizontally placed incisions. [3] Placement of initial incision and tunnel entrance within the maxillary frenum results in little to no visible scarring assisting in maximization of the esthetic outcome. [3]

The suturing technique used in VISTA helps in preventing apical relapse of the gingival margin during the initial stages of healing. [3] Rigid fixation of gingival margins introduced with the present coronally anchored suturing technique minimizes micromotion, one of the major obstacles to regenerative healing. [3] Reduction of micromotion has proven to be major advantage of VISTA technique over conventional methods, where the gingival margin may be subject to displacement during facial movements. [3] Apart from this, the use of PRF membrane contributes to the final success of this technique. The usage of this autogenous biomaterial material eliminates completely the danger of adverse reactions to foreign (non-autogenous) materials. [9] PRF plays multiple vital roles in early wound healing and the development and maturation of normal vasculature.

PRF membranes protects the surgical site, promotes soft tissue healing, and when its fragments mix with the graft material, it functions as a "biological connector" between the different elements of graft acts as a matrix which supports neoangiogenesis, capture of stem cells and migration of osteoprogenitor cells to the centre of the graft. [10] Use of PRF is also cost effective and eliminates any chances of immune reaction. Finally as an alternative to connective tissue grafting, VISTA allows simultaneous treatment of multiple gingival recessions defects without requiring secondary harvesting procedures. [3]

CONCLUSION

Based on the results from this case report we can conclude that VISTA technique together with platelet-rich fibrin membrane can be successfully used as a treatment method for multiple gingival recessions of Millers Class I and Class II defects. However, additional clinical studies with a longer monitoring period and larger number of patients are needed for better assessment of the VISTA technique with PRF membrane for the treatment of these recessions.

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