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Case Report

Management of Miller's Class-III multiple recession defects in mandibular anterior teeth using vista technique and PRF membrane: A case report

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ABSTRACT

Gingival recession, characterized by the displacement of gingival tissue towards the root surface, poses challenges like compromised aesthetics and heightened vulnerability to dental issues such as root caries and sensitivity. Various surgical techniques have been developed to address these concerns, with recent advancements like the Vestibular Incision Subperiosteal Tunnel Access (VISTA) technique showing promise, especially for multiple recession defects in the esthetic zone.

VISTA reduces tissue trauma and promotes optimal healing by minimizing micromotion, thus enhancing the overall success of root coverage procedures. Integrating Platelet-rich fibrin (PRF) membranes aids in soft tissue healing and graft integration, offering a cost-effective and immune-friendly option to bolster procedure success.

In a 31-year-old female patient with receding gums and mobile teeth, vestibuloplasty was performed after oral prophylaxis and stabilization of mobile teeth to address the inadequate vestibular depth and mucogingival deformity. Post-operative care included antibiotics and pain relief medications. Subsequently, a Miller's Class-III multiple gingival defect (MRD) was corrected using the VISTA technique combined with Platelet-rich fibrin (PRF) membrane application. PRF was inserted into the tunnel to cover the denuded roots and to improve the gingival phenotype and the surgical site was sutured. One month later, successful healing was evident with increased vestibular depth, demonstrating effective treatment outcomes.

1. Introduction

Gingival recession, characterized by the apical shift of gingival margin exposing the root surface, poses aesthetic concerns and increases the risk of root caries and dental sensitivity.[1] Addressing this has become crucial due to rising cosmetic demands. Various surgical techniques pioneered over the years, aiming to increase the width of the attached gingiva width and vestibular depth. These include Goldman's mucogingival surgery,[2] Kazanjianin's vestibule deepening techniques[3] and Corn's periosteal separation method.[4]

Vestibuloplasty, using scalpel, electrocautery or lasers, deepens the vestibule.[1] Treatment choice depends on factors like defect size and adjacent tissue health. Gupta et al. presented a successful case using a periosteal pedicle flap combined with fenestration for vestibular deepening.[5] Yadav et al. compared periosteal fenestration and free mucosal graft techniques, favoring the former for preventing fiber reattachment.[6]

Zadeh HH. introduced the VISTA technique for multiple adjacent recessions, involving a subperiosteal tunnel and coronally anchored suturing to enhance healing by minimizing micromotion.[7] This case report details the management of Miller's Class III defects in the maxillary anterior region, employing the VISTA technique alongside

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a PRF membrane.

2. Case Presentation

A 31-year-old female patient reported to the Department of Periodontology, Government Dental College and Hospital, Cuddalore with the chief complaint of receding gums in the lower front tooth region for the past three years. She underwent treatment for receding gums and mobile teeth in a private clinic one year ago. She was a well-controlled diabetic patient under medications. She brushed her teeth once daily using toothpaste and a toothbrush in sweeping motion.

In the lower anterior region, the gingiva was pale pink with rolled-out margins and blunt interdental papilla. Smooth and shiny in consistency with loss of stippling. There was gingival recession (class III) in 31,41 and 42. Vestibular depth was inadequate in relation to 33,32,31,41,42,43. Width of the attached gingiva was inadequate in 32,31,41,42 [Figure 1]. The biotype was thin and the frenal attachment was gingival in both the arches. The tension test was negative. Bleeding on Probing (BOP) was localized in the lower anterior teeth and the generalized probing depth was 2-3 mm. Oral Hygiene Index - Simplified (OHI-S) rated a fair score.

Figure 1: Pre-operative intraoral photograph.

On hard tissue examination, 28 teeth were present in the oral cavity with 18,28,38,48 clinically absent. Proximal contacts were open in relation to 22,21,32,31,41,42 and grade -1 mobility was also present. There were no signs of wasting diseases or trauma from occlusion and the occlusion was Angle's Class I malocclusion. The blood investigation was within normal limits.

The case was diagnosed as generalized chronic marginal gingivitis with inadequate vestibular depth in the lower anterior region and mucogingival deformity in relation to 31,41,42.

2.1. Phase-I

2.1.1. Treatment with Intra-coronal Splinting

Complete ultrasonic scaling was done and oral hygiene instructions were given followed by stabilization of the mobile teeth in the lower anterior region with intra-coronal composite splint bonded lingually [Figure 2]. The teeth were etched with phosphoric acid and bonding agent was applied. A intra-coronal fiber splint was placed from 33 to 43 and cured.Composite build-up was done in the proximal aspects of 31,41,42. This was followed by vestibuloplasty.

2.1.2. Vestibuloplasty

Local anesthesia was administered via infiltration. A horizontal incision was made at the depth of the vestibule using a no. 15 surgical blade [Figure 2]. A split-thickness flap was sharply reflected to the desired depth, with meticulous dissection of muscles and fibrous tissues using BP blade no. 15 [Figure 3]. At the mucogingival junction, a strip of periosteum was excised, creating a fenestration window exposing the bone [Figure 4]. This deliberate removal of periosteum aimed to delay bone healing by 2-3 weeks compared to bone covered with periosteum, effectively preventing relapse. The mucosal flap was then sutured to the sub mucosa by everting the wound margin inwards thus preventing the epithelial cell migration onto the wound site using 3-0 vicryl [Figure 5].

Figure 2: Vestibuloplasty - A horizontal incision was made using a no. 15 surgical blade at the depth of the vestibule.

2.1.3. Post-operative instructions and Follow-up

A periodontal pack was placed at the surgical site and post-operative instructions were given along with the following medications: Cap. Amoxicillin 500 mg (3 times daily for 5 days) and Tab. Zerodol SP (2 times a day for 3 days). Furthermore, the patient was asked to abstain from active lip movements by limited talking, mouth opening, and smiling/laughing. The periodontal pack was removed after 10 days and the wound was irrigated using sterile saline.

Figure 3: A split-thickness flap was reflected sharply up to the desired depth and the muscles and fibrous tissues were dissected to the required depth using BP blade no. 15.

Figure 4: A strip of periosteum was removed at the level of the mucogingival junction, causing a periosteal fenestration window exposing the bone.

Figure 5: Simple interrupted periosteal sutures were given using 3-0 vicryl.

The oral hygiene instructions were reinforced and the patient was recalled after 2 weeks for review. One month postoperatively, the wound healed by secondary intention with scar tissue formation. There were no post-operative complications. We successfully achieved an increase in the depth of the vestibule.

2.2. Phase-II

2.2.1. VISTA technique and PRF membrane placement:

Miller's Class-III gingival defect was then corrected using the VISTA technique in combination with the PRF membrane. The surgical site was anesthetized and curetted using Gracey curettes [Figure 6]. Orthodontic brackets were bonded on 31,41,42 using composite. Tetracycline powder was mixed with saline, applied on the root surfaces, conditioned for 5 minutes, and rinsed to eliminate the smear layer [Figure 7]. A vertical access incision was made using the No.15 blade in the vestibule along the distal line angle of 32 [Figure 8]. Using VISTA periosteal elevators, subperiosteal tunneling was done from the vestibule to marginal gingiva in relation to 31,32,41,42 [Figure 9]. 10 ml of blood was collected, centrifuged and PRF was procured. The PRF was cut into two membranes [Figure 10].

Figure 6: The surgical site was anesthetized and curetted using Gracey curettes.

The surgical site was pre-sutured with a sling suture. PRF was inserted into the tunnel using a tweezer. One-half of the membrane was placed in the gingival third towards the marginal gingiva and another half at the level of the attached gingiva [Figure 11]. A gentle finger pressure was given. The tunnel was advanced coronally and secured with sling sutures anchoring orthodontic brackets with 4-0 prolene [Figure 12]. The primary site was sutured with simple interrupted sutures using 3-0 black silk.

Table 1:

	Tppth NO	Baseline	Post 1 month	Post 2 months	Post 3 month	Post 4 month	Post 5month	Post 6month
Recession	42	4 mm	3.5 mm	3.5 mm	3 mm	3 mm	3 mm	3 mm
Depth	41	3 mm	2 mm	2 mm	2 mm	1 mm	1 mm	1mm
	31	4 mm	2 mm	2 mm	2 mm	2 mm	2 mm	2mm
	42	0.5 mm	1 mm	1 mm	1.5 mm	2 mm	2 mm	2 mm
KTW	41	1 mm	1 mm	2 mm	2 mm	2 mm	2 mm	2 mm
	31	1 mm	1 mm	1.5 mm	2 mm	2.2 mm	2.5 mm	2.5 mm
	42	Thin	Thick	Thick	Thick	Thick	Thick	Thick
BIO Type	41	Thin	Thick	Thick	Thick	Thick	Thick	Thick
	31	Thin	Thick	Thick	Thick	Thick	Thick	Thick

Figure 7: Orthodontic brackets were bonded and root biomodification was done on 31,41,42

Figure 8: A vertical access incision was made using the No.15 blade in the vestibule along the distal line angle of 32.

2.3. Post-operative instructions and Follow-up

A periodontal pack was placed at the surgical site and post-operative instructions were given along with the following medications: Cap. Amoxicillin 500 mg (3 times daily for 5 days) and Tab. Zerodol SP (2 times a day for 3 days) [Figure 14]. The sutures were removed after 2 weeks and

Figure 9: Using VISTA periosteal elevators, subperiosteal tunneling was done from the vestibule to marginal gingiva in relation to. 31,32,41,42

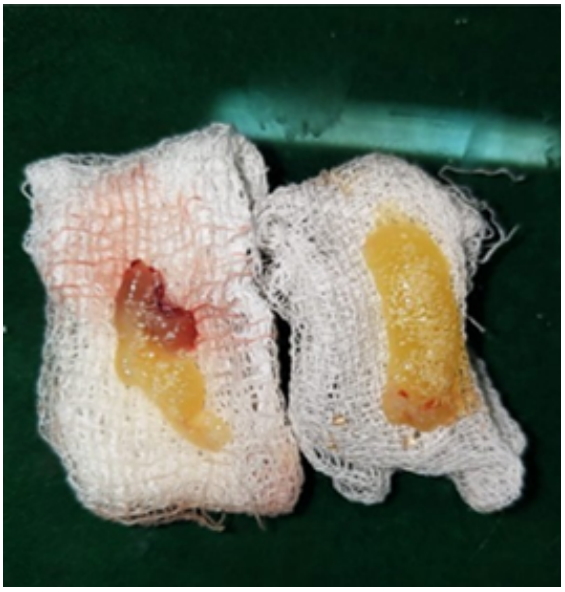

Figure 10: The procured PRF was cut into two membranes.

Figure 11: The surgical site was pre-sutured with a sling suture. PRF was inserted into the tunnel.

Figure 12: The tunnel was advancedcoronally and secured with sling sutures anchoring orthodontic brackets.

Figure 13: The sutures were removed after 2 weeks and the wound was irrigated using sterile saline.

the wound was irrigated using sterile saline [Figure 15]. The oral hygiene instructions were reinforced and the patient was recalled after a month.

3. Results & Discussion

Gingival recession poses challenges including compromised aesthetics, heightened susceptibility to root caries, and dentinal hypersensitivity.[1] Meeting the rising demand for cosmetic improvement, root coverage procedures are increasingly sought after by patients. Surgical interventions

Figure 14: 2 months post-operative photograph

Figure 15: 6 months post-operative photograph

for isolated or multiple recessions vary based on factors like defect size, presence of adjacent keratinized tissue, and gingival thickness.[2] The minimally invasive VISTA approach, coupled with broad wound-healing growth factors, offers distinct advantages in effectively treating multiple defects of recession.

The VISTA approach effectively overcomes limitations. It uses a remote incision to prevent gingival trauma. Precise subperiosteal dissection, reduces tension on the gingival margin while preserving interdental papillae.[8] Initial incision placement within the frenum minimizes visible scarring for better aesthetics. Firm gingival margin fixation with coronally anchored suturing reduces micromotion, a notable improvement over traditional methods.[9] VISTA also enables the treatment of multiple recession defects without additional harvesting procedures.

Garg et al[10] discovered that VISTA alone effectively addresses Class I MRDs (multiple recession defects). However, for Class III recession defects, the addition of a PRF membrane led to superior results in reducing recession depth and gaining CAL six months post-surgery. PRF membranes act as a "biological connector," aiding soft tissue healing by promoting neo-angiogenesis, stem cell capture, and migration of osteoprogenitor cells into the graft center.[7] Kamal A et al[11] used PRF membrane and NPBFP (Non-

pedicled buccal fat pad in class II gingival recession defects using the VISTA technique) and concluded that both gave favourable outcomes. The cost-effectiveness and lack of immune reactions associated with PRF further enhance its attractiveness.

Hegde S et al.[12] investigated the effectiveness of combining VISTA with CTG and PRF for treating Miller's Class I and Class II recession. Both groups showed significant improvement in clinical parameters at 6 months compared to baseline. They suggested that PRF could serve as an alternative for managing multiple recession defects.[12] Additionally, the PRF group exhibited superior results in terms of root coverage percentage compared to the NPBPF group at the 3 and 6-month follow-up.

4. Conclusion

Various treatment options are available for gingival recession, specially for localized defects. However, managing multiple contiguous recession defects presents challenges both functionally and aesthetically for many individuals. Addressing these multiple defects simultaneously can be difficult due to limitations in current procedures. The VISTA technique along with prf membrabe shows promise in overcoming these limitations, particularly in the esthetic zone. Therefore, it can be successfully employed in treating multiple gingival recessions.

5. Source of Funding

None.

6. Conflict of Interest

None.

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