Minimally Invasive Treatment of Mandibular Anterior Lingual Defects by Vestibular Incision Subperiosteal Tunnel Access (VISTA Technique) and Connective Tissue Graft: A Case Report

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3. DISCLAIMER:

Introduction: Treatment of recession defects on the lingual surface of mandibular anteriors is challenging owing to the site specific anatomical features of this region. Surgical approaches based on the use of Subepithelial connective tissue grafts (SCTG) are considered the "gold standard" for the treatment of multiple recession defects. This is the first case report attempting to correct lingual recession by SCTG with the minimally invasive Vestibular incision subperiosteal tunnel access (VISTA) technique.

Case Presentation: A non-smoking 55-year-old male patient presented with hypersensitivity in lower anteriors in August 2016. Multiple lingual recession defects were treated-by placing SCTG harvested from the palate, underneath the subperiosteal tunnel using a midline access incision. Six months after treatment, a significant increase of root coverage (88.17%), gain in gingival thickness (1.29 mm) and width of keratinized gingiva (WKG) (1.41mm) lead to promising outcome and high patient satisfaction.

Conclusion: A minimally invasive surgical technique has been presented that can restore the functional properties of lingual gingiva of the mandibular anterior teeth by repairing gingival defects and re-establish the integrity of the zone of keratinized gingiva.

Keywords:

Connective Tissue; Gingival Recession; Mandible; Sutures; Personal Satisfaction, Treatment Outcome.

Background

Gingival Recession (GR) is a widespread clinical manifestation affecting single or multiple teeth of all tooth types and all tooth surfaces.[1] Over the years several root coverage (RC) techniques have been proposed with predictable treatment outcomes. [2] However, challenges for the clinician arise when patients present with lingual mucogingival concerns, as empirical evidence to make decisions regarding appropriate care in such cases is lacking. Recent Consensus report highlights that RC on the lingual aspect of teeth is possible, but evidence on predictability is insufficient. [2]

GR at the lingual surfaces of lower anterior teeth shows a strong association with the presence of supragingival and subgingival calculus[3] while, few case reports in literature list it as a complication of tongue piercings. [4,8] The goal of treatment for GR should not be merely limited to recreation of the esthetics but must equally focus on restoration of the protective functional morphology of the mucogingival complex and regeneration of the lost attachment apparatus.[5]

Coronally advanced flap (CAF) with autogenous subepithelial connective tissue grafts (SCTG) based RC procedure shows the best clinical outcomes for both recession reduction and complete root coverage (CRC).[5] This case report introduces an approach of combining VISTA with SCTG and demonstrates its successful use in lingual RC.

Clinical Presentation

A non-smoking 55-year-old male presented to the Department of Periodontics, Bapuji Dental College & Hospital in Davangere, India in August, 2016 with hypersensitivity in lower front teeth. Clinical examination showed lingual recession defects in sites #22, #23, #24, #25, #26 and #27 with recession depths varying between 0.5 to 2.5 mm, probing depth of 1.5 mm uniformly, mild plaque accumulation and minimal bleeding on probing (Fig.1). Besides the patient presented a thin gingival biotype[6] measured as 1 mm using digital Vernier caliper and width of attached gingiva ranged between 2-3 mm. Radiographically, only periodontal ligament space widening was observed with respect to #24, #25 and #26 (Fig.2). After discussing the findings, treatment options, and risks with the patient, oral and written consent was obtained to treat this site using SCTG.

Case Management

The initial preparation of recipient teeth included thorough scaling, root planning and minor occlusal correction. After administration of local anesthesia 2% Lignocaine with 1:80,000 adrenaline[†], a vertical midline access incision was made, allowing the creation of subperiosteal tunnel using VISTA # 1 and #5 instruments[‡] only, inserted between the periosteum and bone exposing the lingual osseous plate. The tunnel elevation was extended beyond the mucogingival margin as well as through the gingival sulcus of up to one tooth beyond the teeth requiring RC to mobilize gingival margins and facilitate low tension coronal repositioning (Fig.3). Additionally, the subperiosteal tunnel was extended interproximally as far as the embrasure space permitted while maintaining the papillary integrity. SCTG was harvested through Hurzler's Single Incision Technique[7] and guided using a lasso suture within the tunnel by 4-0 polyglactin[§] suture (Fig.4). Once the SCTG was correctly positioned, the entire mucogingival complex was then advanced in the new position using coronally advanced suturing. This entails placing a horizontal matress suture at approximately 2-3 mm apical to the lingual gingival margin of each involved tooth and placing the knot at the mid-coronal point of the lingual aspect while being secured with the help of composite resin[‖] (Fig.5). This horizontal mattress suture again attempted to engage SCTG inside the tunnel, decreasing the possibility of the apical displacement of the autogenous graft. The vertical incision was then approximated and sutured. The patient was prescribed analgesics as required and was advised to use chlorhexidine mouth-rinse daily for 3 weeks. Sutures at the access incision were removed after 1 week, and coronally anchored bonded sutures were removed at the 3-week postoperative visit.

Clinical Outcomes

At 1 month, the wound was completely healed and the results were stable and satisfactory at 6 months (Fig.6). The patient expressed great satisfaction as dental hypersensitivity was no longer reported. The improved gingival thickness and WKG helped to attain functionally promising result (Table 1).

Discussion

Frequently, narrow, cleft-like defects develop on the lingual aspect of the mandibular incisors, with recession depths of 2 to 3 mm or more often extending beyond the mucogingival junction.[8] The clinical situations where lingual RC is desirable could be to decrease sensitivity, treat or prevent root caries, eliminate a plaque trap or re-establish a normal gingival contour. Lack of literature barring a few case reports of lingual recession

defect coverage [4,8,9,10], could be due to lack of esthetic concerns in this region which probably limits efforts towards its correction. In addition, other technical factors including difficult surgical access, less likely ability of coronal or lateral tissue displacement and less predictable protection of the area from trauma during the healing period than buccal recession defects probably make lingual recession coverage a challenging task. Great care must be paid to the preparation of lingual mucoperiosteal flaps ; attempting to avoid any laceration during flap elevation as the central mandibular and parasymphyseal lingual regions are supplied through a very rich vascular plexus, whose violation during surgical procedures may have critical consequences.[11] Procedural accidents may lead to accumulation of blood in the floor of the oral cavity, swelling of the tongue due to congestion, and airway obstruction as well.[12]

The use of SCTG + CAF in the mandibular arch may not reach the same extent of success as when it is applied to upper arch due to the depth of the vestibular fornix, flap tensions, and flap thickness found in the maxilla and mandible.[5] However, the recently introduced, VISTA technique used in this case utilizes the inherent ease of subperiosteal tunnel preparation while maintaining crucial papillary integrity using a specialized set of instruments-VISTA #1 and #5 owing to their shape and size which allows easy maneuverability in the anterior lingual region[13]. The vertical incision facilitated direct visualization of the cortical plate to rule out dehiscence and allows broader access for graft insertion and the coronally anchored suturing technique facilitates stabilization of the coronally advanced gingival marginal tissue. Also, this vertical incision is less likely to disrupt the blood supply as the sublingual and submental arteries in the region, travel from the vicinity of the mylohyoid muscle attachment along the bone surface in an anterosuperior direction.[12]

A thin gingival biotype seems to serve as a locus minoris resistentia for further development of GR defects [14]. The SCTG provides the most stable outcomes on long-term due to the improvements on WKG and biotype [2], which has been attained in this case. The SCTG was sandwiched between the periosteal lining of the overlying tunnel flap and the underlying lingual cortical plate (Fig.7). The lingual side of the parasymphyseal region of the mandible has a rich blood supply with the vascular source in the inter-foraminal lingual cortical plate[15]. Hence, this allowed rapid capillary outgrowth and granulation tissue formation for vascularization of the graft. The gains in the WKG and thickness promoted by the proposed RC therapy seem to be key factors for the stability of the results which are clinically significant.

Conclusion:

The treatment of lingual GR is technically challenging and has not been routinely reported or is not performed. Consensus Report AAP Regeneration Workshop in its research priorities highlighted the need for an additional investigation on the treatment of multiple recession defects and other oral sites, including lingual/palatal sites [2]. This case report demonstrates the feasibility of using autogenous SCTG for the correction of lingual recession as well as soft tissue augmentation.

Summary

Why is this case new information?	• To the best of author's knowledge it is the first case report to describe the use of SCTG along with the VISTA technique to treat lingual recession
What are the keys to successful management of this case?	• Removal of the etiologies associated with defects (plaque induced inflammation, tongue piercings, traumatic habits etc.)
	• Surgical technique especially usage of correct instrument (VISTA #5 instrument for easy adaptation to

	the concavity of the lingual cortical plate and hence good for tunnel preparation), tension release of flap as well as to secure flap coronally throughout the healing period.
	• Harvest good quality connective tissue graft to increase gingival thickness to ensure long term stability and result.
What are the primary limitations to success in this case?	• Case selection (purely recession defect with no intrabony defect component)

Acknowledgements

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FIGURE 1

Clinical Examination revealed Gingival recession defects in multiple teeth on lingual surface. Note the thin gingival biotype.

FIGURE 2

Preoperative periapical radiographs (A: Left; B:Right) revealed widening of Periodontal ligament space with crestal bone within 2 mm from the CEJ.

FIGURE 3:

Subperiosteal Tunnel preparation from # 21 to #28 tooth using VISTA

#5 Instrument through the vertical midline access incision

FIGURE 4:

Insertion of SCTG into the VISTA tunnel using Lasso suture after which the autograft was stabilized in place using the same suture.

FIGURE 5:

Following placement of SCTG, the gingival margin was coronally repositioned and anchored to mid-coronal lingual surface of teeth with Flowable composite resin. Midline incision was also approximated and sutured using 5-0 polyamide suture.

FIGURE 6:

Six months outcome.

FIGURE 7a:

Schematic illustration of subperiosteal tunnel preparation using VISTA instruments.

FIGURE 7b:

Schematic illustration of placement of SCTG under the subperiosteal tunnel and its relationship with coronal anchoring suture in VISTA approach.

TABLE 1:

Depicts preoperative and 6 months postoperative values

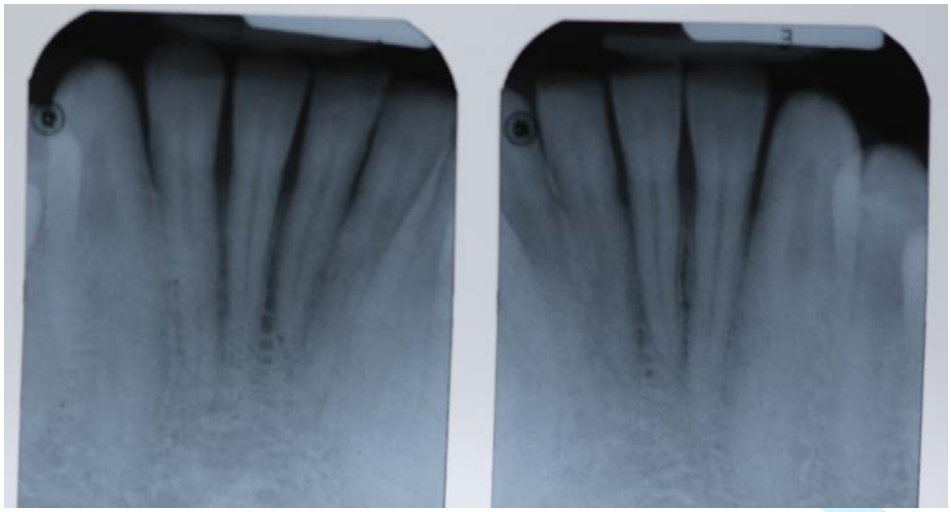
Tooth Number	Recession (mm)		Width of Keratinized gingiva (WKG in mm)		Gingival Thickness (GT in mm)	
	Pre operative	Post operative	Pre operative	Post operative	Pre operative	Post operative
#22	0.75	0	2	3.5	1	2.5
#23	2.5	0	1.5	3	0.75	2
#24	2.5	1	2	3	0.75	2
#25	1.75	0.25	1.5	3	0.75	2
#26	1.5	0.25	1.5	3	1	2
#27	0.5	0	2	3.5	1	2.5

† Lignox 2% A, Indico remedies,India

‡ V.I.S.T.A. Tunnelling Kit, DoWell Dental products Inc, California

§ Trusynth, Sutures India Pvt. Ltd., India

‖ Filtek™ Bulk fill flowable composite, 3M ESPE, India



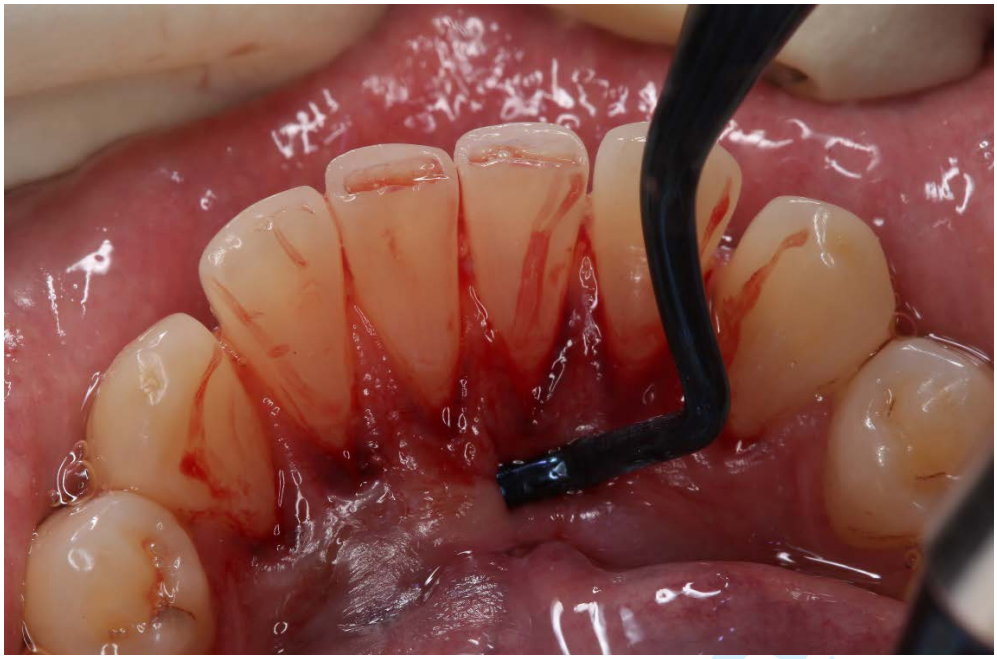


FIGURE 6: Six months outcome.

'FIGURE Latest'

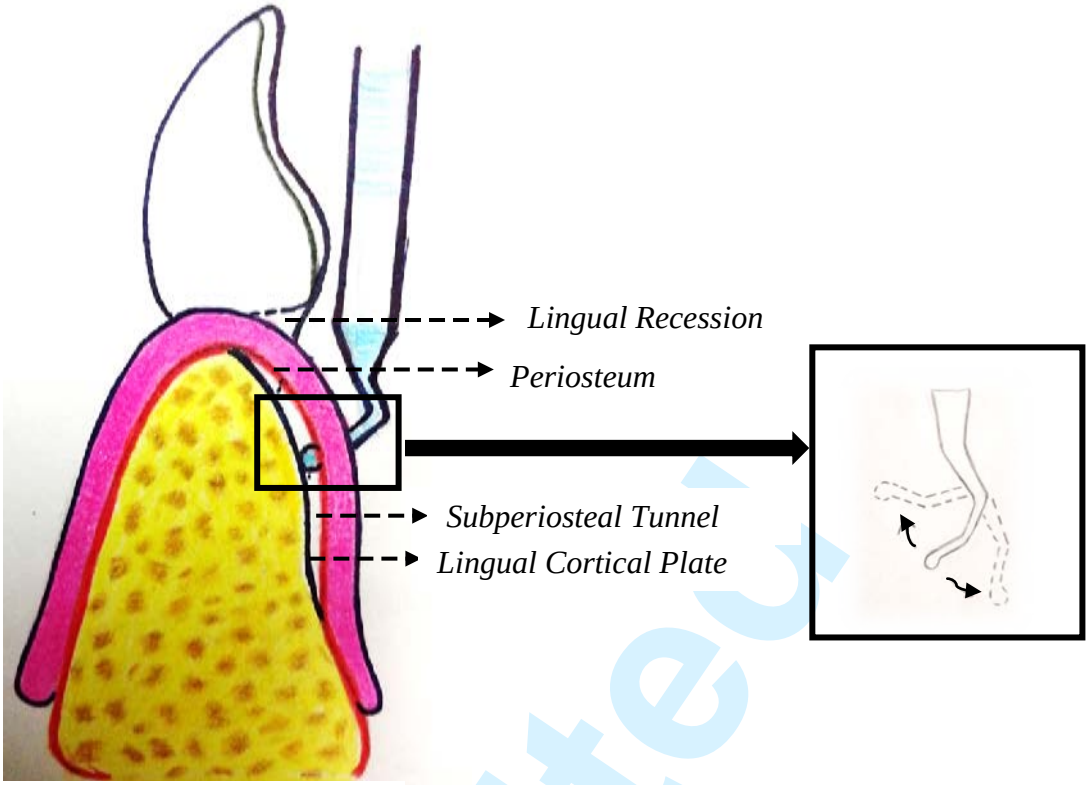


FIGURE 7a: Schematic illustration of the subperiosteal tunnel preparation using VISTA instruments.

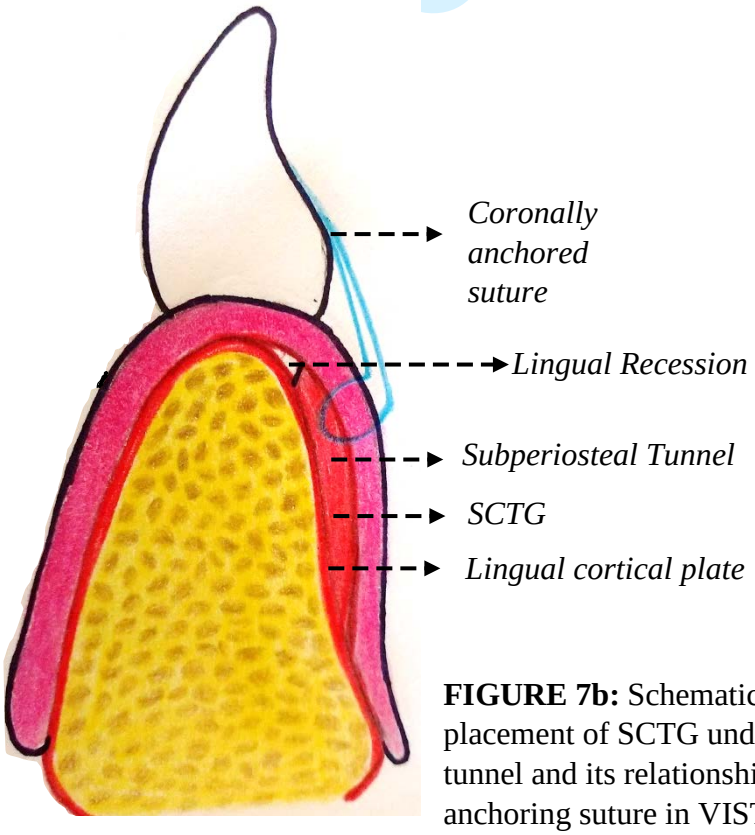


FIGURE 7b: Schematic illustration of placement of SCTG under the subperiosteal tunnel and its relationship with coronal anchoring suture in VISTA approach.

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