



Aydın Dental Journal

Journal homepage: <http://dergipark.ulakbim.gov.tr/adj>
DOI: 10.17932/IAU.DENTAL.2015.009/dental_v01i2007



Minimally Invasive Approach to Gingival Recession

Diş eti Çekilmesinde Minimal İnvaziv Yaklaşım

Burak Arda Önder¹, Resül Çolak^{2*}

ABSTRACT

Gingival recession is defined as the gingival margin migrating apically and exposing the root surface. Many techniques have been recommended for the treatment of gingival recession. The m-VISTA is an up-to-date technique that complies with the principles of minimally invasive surgery to provide satisfactory results in root coverage procedures, but its surgical stages are very sensitive. A 23-year-old female patient applied to our clinic with complaints of gingival recession in her lower left lateral, canine and premolar teeth. After the area was evaluated, the m-VISTA technique was decided for treatment. After the operation and during the 18-month follow-up period, complete root coverage was achieved in all 3 teeth.

Keywords: *Gingival recession, Minimally invasive surgical procedure, Tooth*

ÖZET

Diş eti çekilmesi, diş eti kenarının apikal yönde göç etmesi ve kök yüzeyinin açığa çıkması olarak tanımlanır. Diş eti çekilmesinin tedavisi için birçok teknik tavsiye edilmiştir. M-VISTA, kök yüzeyi kapatma işlemlerinde tatmin edici sonuçlar elde etmek için minimal invaziv cerrahi prensiplerine uygun, güncel bir tekniktir, ancak cerrahi aşamaları oldukça hassastır. Kliniğimize 23 yaşında kadın hasta sol alt lateral, kanin ve premolar dişlerindeki diş eti çekilmesi şikayeti ile başvurdu. Bölge değerlendirildikten sonra tedavisi için m-VISTA tekniğine karar verildi. Operasyon sonrası ve 18 aylık takip döneminde 3 dişte de tam kök kapatma elde edildi.

Anahtar kelimeler: *Diş, Diş eti çekilmesi, Minimal invaziv cerrahi işlemler*

¹Research Assistant, Department of Periodontology, Zonguldak Bülent Ecevit University Faculty of Dentistry, Zonguldak, Turkey

²Assoc. Prof., Department of Periodontology, Zonguldak Bülent Ecevit University Faculty of Dentistry, Zonguldak, Turkey

*Corresponding Author: Resül Çolak, e-mail: r.colak@beun.edu.tr, ORCID: 0000-0001-5210-1119, Department of Periodontology, Zonguldak Bülent Ecevit University Faculty of Dentistry, Zonguldak, Turkey

Introduction

Gingival recession is defined as the gingival margin migrating apically and exposing the root surface.¹ Dentin sensitivity, root surface caries, aesthetic concerns, and difficulties in plaque control due to gingival recession create a need for covering the exposed root surfaces.² Since 1960, numerous surgical techniques have been suggested for treating gingival recession. Subepithelial connective tissue graft is highly predictable for root coverage and is considered the gold standard due to its dual blood supply, aesthetic superiority, and increase in keratinized gingival width.³ Allen then created a split-thickness suprapariosteal envelope flap to treat multiple consecutive gingival recessions.⁴ Later, Zabalegui et al.⁵ developed the "tunnel" approach. However, in this approach, the envelope flap could not be advanced coronally; only the exposed root surface was covered with a subepithelial connective tissue graft. Further modifications to the tunnelling approach have been proposed for this technique.⁶ Later, Zuhre et al.⁷ introduced the coronally advanced modified tunnel technique as a microsurgical approach. Increasing aesthetic expectations of patients have brought about the need for surgeons to improve their surgical skills and develop more current and original techniques to satisfy patient demands. This makes things difficult because the methods applied in mucogingival surgery are sensitive and involve different procedures and their combinations. While traditional methods yield satisfactory and acceptable outcomes in the treatment of gingival recession, there is a necessity for more advanced and refined techniques that result in less post-operative surgical morbidity and deliver superior results compared to traditional approaches methods.⁸ For this purpose, minimally invasive surgical techniques have been

used in mucogingival surgical procedures and have been widely preferred for multiple indications, including root surface coverage. The m-VISTA is an up-to-date technique that complies with the principles of minimally invasive surgery to provide satisfactory results in root capping procedures, but its surgical stages are very sensitive.⁹ This case report aims to evaluate the effectiveness of the m-VISTA technique combined with CTG in the treatment of multiple gingival recessions in the lower jaw during an 18-month follow-up period.

Case Report

A 23-year-old, healthy male reported on October 7th, 2022, to the Department of Periodontics, Bulent Ecevit University, Zonguldak, Turkey, with a chief complaint of receding gums, poor esthetics and sensitivity about the left lower lateral incisor, canine and premolar teeth. The patient, a non-smoker with no history of periodontal disease, expressed a strong desire for an effective and aesthetically pleasing solution. After phase 1 periodontal treatment, the patient was re-evaluated, and the decision for surgery was made. The m-VISTA technique was preferred due to its ability to provide satisfactory results in root coverage procedures, its compliance with the principles of minimally invasive surgery, and the suitability of the operation area, which had sufficient keratinized tissue width, vestibule depth, and gingival thickness. Written consent was obtained from the patient before the operation. Before the operation, clinical attachment level (CAL), probing depth (PD), gingival recession depth (GRD), gingival recession width (GRW), and keratinized tissue width (KTW) were measured with a Williams Probe (Hu-Friedy Manufacturing, Chicago, IL, USA) on the relevant teeth (Table 1). As a result of clinical examination, the relevant teeth were recession type 1 (RT 1).¹⁰

Table 1. Clinical parameters at baseline and at the end of the follow-up period

		32	33	34
PD	Pre. Op.	1 mm	1 mm	1 mm
	Post. Op. 18 month	1 mm	1 mm	1 mm
CAL	Pre. Op.	4 mm	3 mm	3 mm
	Post. Op. 18 month	-	-	-
GRD	Pre. Op.	3 mm	2 mm	2 mm
	Post. Op. 18 month	0 mm	0 mm	0 mm
GRW	Pre. Op.	2 mm	3 mm	3 mm
	Post. Op. 18 month	0 mm	0 mm	0 mm
KTW	Pre. Op.	2 mm	2 mm	2 mm
	Post. Op. 18 month	3 mm	5 mm	6 mm

PD: Probing depth, CAL: Clinical Attachment Loss, GRD: Gingival Recession Depth, GRW: Gingival recession Width, KTW: Keratinized Tissue Width

Preparation of the Recipient Site with the m-VISTA Technique:

After applying local anesthesia (Maxicaine Fort-80 mg articaine hydrochloride and 0.020 mg epinephrine), root planing procedures were performed on the exposed root surfaces. A lingual splint was applied between teeth 32, 33 and 34 to ensure the sutures were fixed in the coronal position. This technique, known for its precision, included the following stages: First, a single vertical incision allowed split-thickness flap elevation extending to the periosteum.¹¹

The vertical incision was at the level of the alveolar mucosa, mesial to the lateral tooth. Afterwards, the intracrevicular incisions, starting from the left central tooth and extending to the 2nd premolar tooth, were made with a microsurgical blade. (SM69®, Swann-Morton Ltd, United Kingdom) A split-thickness flap elevation extending beyond the mucogingival line was performed using specific tunnel instruments. (Stoma®, Ancladen S.L., Barcelona, Spain) Split-thickness elevation was first made from a vertical incision and the gingival margin. Finally, papillary elevation was performed for passive coronal positioning.

Preparation of the Donor Site:

After local anesthesia was applied to the palatal region, the palatal region on the same side was selected as the donor site for the necessary connective tissue of sufficient length and thickness (1.5 mm) to cover the gingival recession observed in the three adjacent teeth. After the epithelial surface of the obtained tissue was removed, the graft was transformed into de-epithelialized FGG form. In order to control the bleeding in the area, it was sutured circumferentially with 4/0 silk suture (Silk® Dogsan Inc, Trabzon, Turkey) from the absorbable gelatin (Spongostan®) that was compatible with the graft we placed in the donor area.

Placing the Graft in the Recipient Area:

Connective tissue was placed through a vertical incision using a 5/0 polypropylene suture (Propilen®

Dogsan Inc, Trabzon, Turkey). In order to guide the ideal positioning of the graft, the suture needle was passively removed from the vertical incision, starting from the distal part of the prepared tunnel. After passing through the graft, the needle tip followed the same route, returning through the tunnel to the gingival margin where it started. The graft was placed precisely in the recipient area by gently pulling the distal suture and using tunnel tools. The graft and the created tunnel were positioned in a coronal position, exceeding the CEJ, with the help of a splint in the interproximal with a 5/0 non-resorbable polypropylene suture using the double-sling suture technique. To position the marginal area of teeth 32 and 33 more coronally, a 5/0 non-resorbable polypropylene suture was passed through the keratinized tissue at the apical of the gingival margins of these teeth without containing de-epithelialized FGG and fixed to the buccal side of the adjacent teeth with the help of composite filling material. This suture technique, which includes only the flap, provides a higher level of adaptation of the tissues, reduces dead space, and tightens the wound (Fig 2).¹² Finally, the vertical incision was closed with simple, non-continuous sutures. The patient was instructed not to remove or disturb the pack or the surgical site until the sutures were removed and we suggested to refrain from brushing for 2 weeks.^{13,14} All sutures were removed from the palate in the first week after the surgery and from the recipient area at the end of the second week (Fig 3).

In the third week after the operation, the Stillman brushing technique was explained to the patient, and she was instructed to restart oral hygiene control with the help of an ultra-soft brush. Six weeks after the operation, the patient returned to routine oral hygiene habits, including interface cleaning. Finally, the patient was included in the postoperative supportive periodontal treatment and follow-up program, including 1, 3, 6 and 18 months after the operation.



Figure 1: Preoperative view of recipient site.



Figure 2: Postoperative view, the connective tissue graft placed with the m-VISTA technique is fixed to the region with double sling and composite sling suture techniques.



Figure 3: Postoperative view of 14th day; all sutures and composite filling materials were removed.



Figure 4: Postoperative view of 1 month



Figure 5: Postoperative view of 6-month



Figure 6: Postoperative view of 18-month

Discussion

In these periods, when patients' aesthetic expectations are increasing, restoring the ideal pink aesthetic has become the primary necessity of the operation techniques used in gingival recession treatments. Several tunnelling techniques have been proposed to maintain existing aesthetics, avoid recurrence, ensure the continuity of papillary integrity, and prevent scar formation resulting from vertical release incisions. Tunnelling techniques cause trauma to the sulcular epithelium but are a widely accepted blunt and sensitive technique.¹⁵

During the tunnel operation, half-thickness flap preparation may cause perforations in the flap. In addition, the sulcular approach in this technique is associated with its relatively blunt preparation. The mentioned complications and difficulties may be seen more frequently, especially in the thin gingival phenotype. The M-VISTA technique differs from the original VISTA due to its access through sulcular and vertical incisions and split-thickness flap design. In this respect, the M-VISTA technique positively affects the preparation of the tunnel by providing ease of Access.¹⁶

The M-VISTA technique has been recommended to prevent possible complications that may arise with other tunnel techniques. The mini vertical incisions extending into the alveolar mucosa improved visual access, while surgery time was reduced and patient comfort increased. Unlike the original VISTA technique, the tunnel we prepared in the supra-periosteal layer preserved the vascularity of the flap by leaving the periosteum continuous on the bone surface and allowed us to prevent further bone loss. Retention of the periosteum in the region allows early revascularisation of the CTG. Positioning the CTG between two vascular-rich layers helps immediate reperfusion and preserves the vitality of the graft while providing better colour harmony between tissues.¹⁷ Sulcular access in tunnel operations increases the risk of traumatising and perforation of sulcular tissues. This situation negatively affects the region's recovery potential. The M-VISTA technique provides better access to the area than other tunnel operation techniques and is minimally invasive compared to different types of operations. The key to the success of M-VISTA operations is supra-periosteal dissection, which prevents tension on the coronally positioned gingival margin and contributes to the maintenance of papillary integrity. In this case report, using autogenous CTG instead of other graft types may have improved clinical result.¹⁸ The

fundamental commonality expected from successful root coverage operations is the stable positioning of the graft in the recipient site. In this study, the graft was tightly fixed to the recipient site without tension on the flap by anchoring it from the splint extensions in the interproximal with the double-sling suture technique. At the 18-month follow-up, complete root coverage was achieved without recurrence in all three teeth with recession, and a significant change in the gingival phenotype towards a thicker phenotype was achieved.

Conclusion

When the studies on tunnel technique applications are examined, it is mainly preferred in the upper jaw and areas with thick gingival phenotype. Our study includes the results of the m-VISTA method, which is a modification of this technique, in the region with a thinner phenotype in the lower jaw, and 18-month follow-up data. Although the thin phenotype of the lower jaw increases the risks of perforation and laceration in the prepared tunnel, the ease of access and vision provided by the m-VISTA technique prevents possible complications. The double-sling suture technique ensures the ideal adaptation of the CTG placed inside the tunnel to the papilla base and positions the connective tissue with the flap more coronally. Instead of applying composites in the contact areas required for the double-sling suture technique in teeth with diastema, the necessary anchorage for this suture technique can be provided with the help of a splint applied from the lingual region before the operation.

There is a need for clinical studies on minimally invasive surgical techniques, especially in the thin gingival phenotype, where tissue management is complex.

Acknowledgements

None.

Ethical Approval

Ethical approval is not necessary. An informed consent form is available.

Conflict of Interest

None of the authors of this article has any relationship, connection or financial interest in the subject matter or material discussed in the article.

Sources of Funding

During this study, no material and/or moral support was received from any pharmaceutical company directly related to the research topic, any company

that supplies and/or manufactures medical devices, equipment and materials, or any commercial company that could negatively affect the decision to be made regarding the study during the study evaluation process.

Authorship Contributions

Idea/Concept: R.Ç, B.A.Ö Design: R.Ç, B.A.Ö Control/Supervision: R.Ç, B.A.Ö Literature Review: R.Ç, B.A.Ö Data Collection and/or Processing: R.Ç, B.A.Ö Analysis and/or Interpretation: R.Ç, B.A.Ö Writing the Article: R.Ç, B.A.Ö Critical Review: R.Ç, B.A.Ö

References

1. Kassab MM, Cohen RE. The etiology and prevalence of gingival recession. *J Am Dent Assoc.* 2003;134(2):220-5.
2. Ribeiro FS, Zandim DL, Pontes AEF, Mantovani RV, Sampaio JEC, Marcantonio Jr E. Tunnel technique with a surgical maneuver to increase the graft extension: case report with a 3-year follow-up. *J Periodontol.* 2008;79(4):753-8.
3. Yadav AP, Kulloli A, Shetty S, Ligade SS, Martande SS, Gholkar MJ, et al. Sub-epithelial connective tissue graft for the management of Miller's class I and class II isolated gingival recession defect: A systematic review of the factors influencing the outcome. *J Investig Clin Dent.* 2018;9(3): e12325.
4. Allen AL. Use of the suprapariosteal envelope in soft tissue grafting for root coverage. I. Rationale and technique. *Int J Periodontics Restorative Dent.* 1994;14(3):216-27.
5. Zabalegui I, Sicilia A, Cambra J, Gil J, Sanz M. Treatment of multiple adjacent gingival recessions with the tunnel subepithelial connective tissue graft: a clinical report. *Int J Periodontics Restorative Dent.* 1999;19(2):199-206.
6. Sculean A, Cosgarea R, Stähli A, Katsaros C, Arweiler NB, Miron RJ, et al. Treatment of multiple adjacent maxillary Miller Class I, II, and III gingival recessions with the modified coronally advanced tunnel, enamel matrix derivative, and subepithelial connective tissue graft: a report of 12 cases. *J Clin Periodontol.* 2016;47(8):653-9.
7. Aroca S, Keglevich T, Nikolidakis D, Gera I, Nagy K, Azzi R, et al. Treatment of class III multiple gingival recessions: a randomized-clinical trial. *J Clin Periodontol.* 2010;37(1):88-97.
8. Barootchi S, Tavelli L. Tunneled coronally advanced flap for the treatment of isolated gingival recessions with deficient papilla. *Int J Esthet Dent.* 2022;17(1):14-26.
9. Lee C-T, Hamalian T, Schulze-Späte U. Minimally invasive treatment of soft tissue deficiency around an implant-supported restoration in the esthetic zone: modified VISTA technique case report. *J Oral Implantol.* 2015;41(1):71-6.
10. Papapanou PN, Sanz M, Buduneli N, Dietrich T, Feres M, Fine DH, et al. Periodontitis: consensus report of workgroup 2 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. *J Clin Periodontol.* 2018;45(Suppl 20):173-S82.
11. Zadeh HH. Minimally invasive treatment of maxillary anterior gingival recession defects by vestibular incision subperiosteal tunnel access and platelet-derived growth factor BB. *Int J Periodontics Restorative Dent.* 2011;31(6):653.
12. Abdelhaleem M, Saleh W, Elmeadawy S. Treatment of gingival recession with vestibular incision subperiosteal tunnel access and advanced platelet-rich fibrin. *BMC Oral Health.* 2025;25(1):63.
13. Pilloni A, Dell'Olmo F. The mucosal released-coronally advanced flap: a novel surgical approach—A case report. *Clin Adv Periodontics.* 2025;15(2):105-10.
14. Cheriyan SR, Ravindran S, Devi S, Rajeevan S. Management of Miller's Class I gingival recession using Zucchelli's modified coronally advanced flap technique: a case report. *Cell Free DNA.* 2024;16(2):73-6.
15. Vincent-Bugnas S, Borie G, Charbit Y. Treatment of multiple maxillary adjacent class I and II gingival recessions with modified coronally advanced tunnel and a new xenogeneic acellular dermal matrix. *J Esthet Restor Dent.* 2018;30(2):89-95.
16. Najafi B, Kheirieh P, Torabi A, Cappetta EG. Periodontal regenerative treatment of intrabony defects in the esthetic zone using modified vestibular incision subperiosteal tunnel access (M-VISTA). *Int J Periodontics Restorative Dent.* 2018;38(Suppl):e9–e16.
17. Caffesse RG, Burgett FG, Nasjleti CE, Castelli WA. Healing of free gingival grafts with and without periosteum: Part I. Histologic evaluation. *J Periodontol.* 1979;50(6):347-56.
18. Ko H-Y, Lu H-K. Systematic review of the clinical performance of connective tissue graft and guided tissue regeneration in the treatment of gingival recessions of Miller's classification grades I and II. *J Evid Med Clin.* 2010;2(2):63-71.