

Case Report

Introducing an Innovative Pre-Suturing Technique for Bleeding Control in Palatal Graft Harvesting: A Case Report

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KEY WORDS

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ABSTRACT

Pre-suturing the palate effectively reduces intraoperative bleeding by compression of the vascular bundles. As a new method, we decided to place three preoperative sutures in the palate before harvesting the graft from the donor site with the aim of compressing the greater palatine artery. Our suggested positions are correlated to the medial and canine branches of greater palatine artery. The sutures are placed in the distal of the canine, distal of donor site and near the midline of the palate, respectively. This technique improves surgical visibility, minimizes complications, and enhances clinical outcomes and patient satisfaction. The case report suggests its effectiveness in reducing donor site bleeding.

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Introduction

Free gingival grafts (FGGs) and subepithelial connective tissue grafts (SCTGs) harvested from the palate are widely utilized for the enhancement of periodontal and peri-implant soft tissues [1]. Autogenous palatal grafts have demonstrated excellent clinical outcomes, particularly with respect to graft integration at the recipient site, improvement of tissue biotype, and increased width of keratinized gingiva [2-4]. Despite their clinical advantages, autogenous tissues present certain limitations. The harvesting procedure may prolong healing at the donor site and contribute to increased patient morbidity. Patients often experience postoperative discomfort and numbness for a few weeks [5]. Moreover, there are individual and anatomical limitations, such as the amount and quality of obtainable tissue, which vary depending on the patient's age, sex, and palatal vault morphology. The overall amount available for grafting procedures is

also limited by the position of the nerves and palatal vessels [6]. One common side effect of this procedure is prolonged bleeding during and after surgery brought on by damage to the palatal blood vessels, regardless of the palatal harvesting technique used [7].

Operation near the vascular greater palatine bundle (GPB) is often necessary to obtain palatal soft tissue grafts. One known risk associated with palatal tissue harvesting is the potential for excessive bleeding from the palatal donor site because of GPB damage [8].

The literature documents various techniques for controlling bleeding from the palatal soft tissue donor site and promoting healing. These methods include applying platelet-rich fibrin (PRF), modified Hawley appliances, Essex palatal stents, periodontal dressings, ligature wires, and local hemostatic medications [9-10]. It has been proposed that a suture placed distal to the intended tissue harvesting site may prevent hemorrhaging [11].

This study authenticates this new pre-suture technique and suggests a clinical protocol for limiting hemorrhage. The authors believe this technique by increasing the number of sutures could be a valuable and practical way to provide a better surgical experience in palatal soft tissue harvesting, potentially overcoming the drawbacks of autogenous tissue.

Case Presentation

A 50-year-old female patient was referred to the Periodontics Department at Shiraz University of Medical Sciences for a periodontal assessment due to gingival recession. She had no significant medical issues and was in overall good health. The patient did not have a history of bleeding disorders, and her vital signs were normal. The intraoral examination revealed a thin periodontal biotype. The palatal mucosa appeared healthy, without inflammation, ulcers, or other pathological conditions.

Clinical examination revealed a gingival recession in the maxillary left canine region and insufficient keratinized tissue width and gingival thickness. The recession was measured at 2mm, and the clinical attachment loss was approximately 4mm from the cemento-enamel Junction (CEJ). Oral hygiene instruction was given to achieve satisfactory plaque control before the surgical phase. To cover the exposed root area, a FGG surgery was planned to augment the gingiva and achieve recession coverage. The surgery was performed after a preoperative mouth rinse with chlorhexidine 0.2%. The local anesthesia was carried out with 2% lidocaine and epinephrine at a concentration of 1:100,000. We decided to place three preoperative sutures in the palate before harvest-

ing the graft from the donor site to decrease bleeding and have better visibility for the following procedures (Figure 1).

An 18mm triangular body, a half-circle 19-needle with a 3-0 black braided silk suture was used for suturing. We used a Castroviejo needle holder to be more accurate in the points of entry and insertion of the needle. The first suture was placed in the distal of the canine to compress vascular bundles at the palatal rugae, which is a dangerous bleeding site during the harvesting of the FGG (Figure 2a). The second suture was applied as the GPB compression suture (GPCS). The needle was advanced along its curvature to the depth of the palatal vault, passing from point C toward the palatal midline. The needle emerged at point D, positioned medial and anterior to point C (Figure 2b). The suture was then tied with sufficient tension to produce visible palatal blanching. The last suture was placed near the midline of the palate in an anteroposterior direction (Figure 2c).

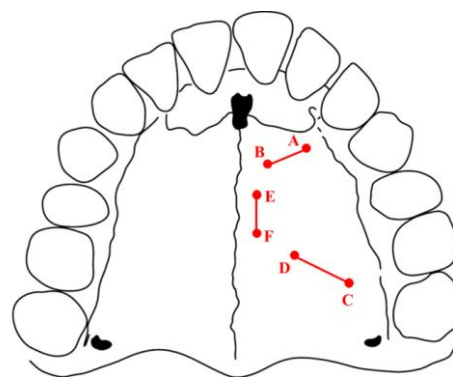


Figure 1: A schematic drawing illustrating the entry and exit points of the needle for the proposed pre-suturing technique. A to B, C to D, and E to F represent the first, second, and third pre-suture

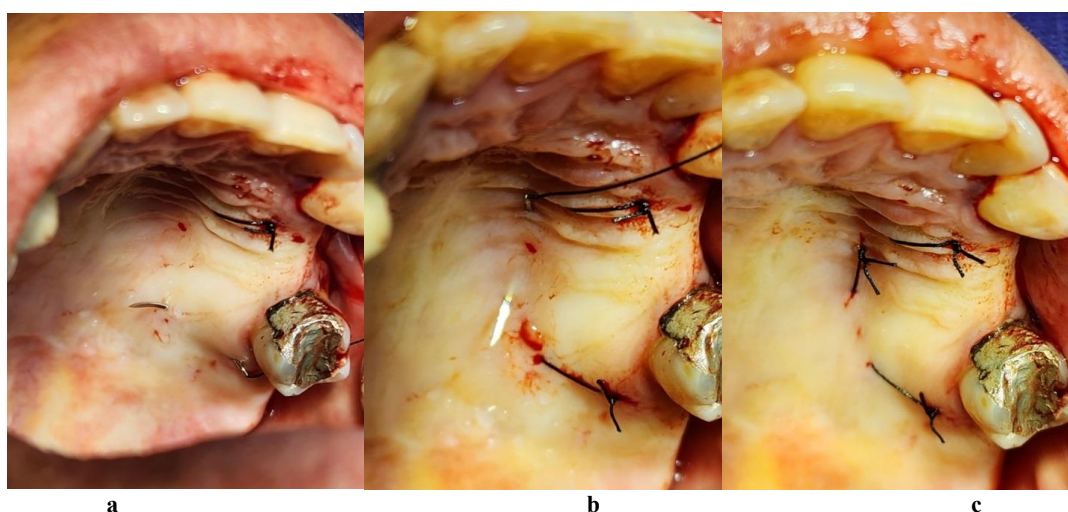


Figure 2: Step-by-step presentation of three pre-suture placements before harvesting a free gingival graft from the donor site. Visible blanching of the palate at the area of the sutures indicates a correctly placed compression suture

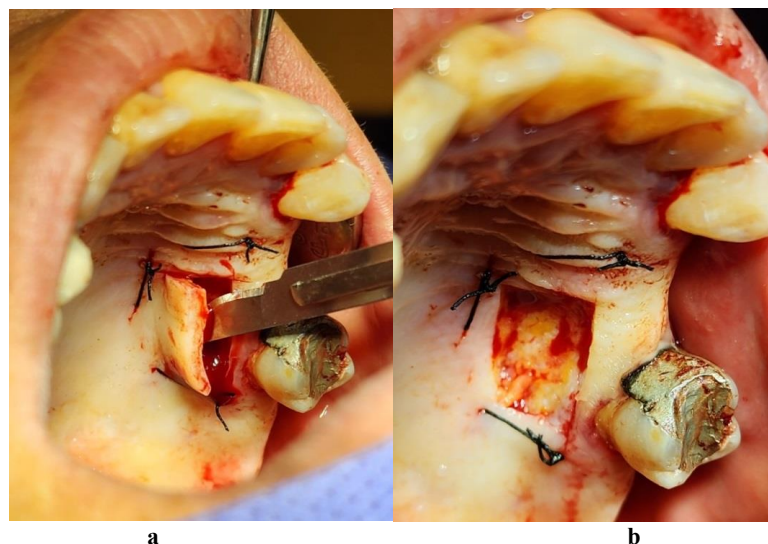


Figure 3: Harvesting of free gingival graft, satisfactory hemostasis is achieved with the use of pre-sutures. Some additional sutures were placed to minimize patient discomfort and reduce bleeding after surgery

Following pre-sutures placement, bleeding was considerably reduced and effective hemostasis was obtained in this case (Figures 3a-b). Both donor and recipient sites demonstrated satisfactory healing, with complete palatal wound healing at the 3-week appointment. Also, the patient reported low postoperative bleeding and pain.

Discussion

Bleeding and paresthesia emerge as the most frequently reported complications associated with palatal soft tissue graft harvesting [8, 12]. A comprehensive understanding of the anatomic landmarks, together with proper suturing, represents the most reliable preventive measure against these procedure-related complications [13]. The existing literature predominantly describes techniques for palatal hemorrhage management that are implemented after the initiation of bleeding. The pre-suturing technique can be particularly beneficial in surgeries involving the greater palatine artery (GPA) because it helps reduce the risk of bleeding and have a better visibility in procedure site. By compressing the soft tissues surrounding the artery, pre-suturing can control bleeding from the GPA, which is often challenging due to anatomical variability. This approach enhances both the safety and precision of the surgery, contributing to better clinical outcomes.

A meta-analysis by Kim DW *et al.* [14] presented the location and variations of the greater palatine foramen (GPF) and greater palatine canal (GPC) anatomy. They proposed the location of GPF 15.00–15.44mm

from the midline maxillary suture, 1.90-3.22mm from the posterior border of the hard palate, and 36.19- 38.45 mm from the incisive foramen. Understanding these variations helps clinicians plan incisions better, ensuring that the GPA is protected during graft procedures.

Tavelli *et al.* [15] proposed a CEJ-based safety zone for palatal donor site harvesting to minimize the likelihood of GPA damage. Their results revealed a wider safety margin in the second molar and second premolar regions (10.9 to 9.7 mm) compared with a significantly narrower zone in the first premolar and canine areas (7.6 to 5 mm), supporting the recommendation to avoid harvesting anterior to the distal of the canines.

Since there is a margin of error in locating the GPB, pre-suturing by stabilizing the tissue around the neurovascular structures reduces the chances of accidental injury and blood loss, particularly when anatomical landmarks are difficult to identify.

Greenstein *et al.* [16] suggest that deep sutures should be placed distal to the harvesting site prior to initiating surgery to preclude hemorrhage in case of injury to the GPA; additional deep sutures might be needed to manage bleeding from a damaged vessel.

Our suggested position of pre-sutures is correlated to the medial and canine branches of GPA to prevent inadvertent injury to these branches, which can result in excessive bleeding and compromise graft viability.

Our study also placed the posterior palatal pre-suture alongside the medial and canine pre-sutures to achieve better hemostasis during graft harvesting and less post-

operative bleeding.

In conclusion, the pre-suturing technique offers numerous benefits, including reducing intraoperative hemorrhage and enhancing graft harvesting precision. Creating a less stressful surgical procedure improves the clinician's ability to perform efficiently and the patient's overall experience. Less bleeding allows for better visibility, less chairside time, and reduced patient anxiety, all of which might contribute to better clinical outcomes and higher satisfaction levels. As a result, pre-suturing may serve as a valuable technique for enhancing the graft's technical success and improving the procedure's emotional and psychological aspects.

This report is limited by its single-case design, lack of quantitative assessment of bleeding, and absence of a control group. Further controlled clinical studies are needed to validate the effectiveness and reproducibility of this technique.

Conclusion

Our recommended placement of pre-sutures aligns with the medial and canine branches of the GPA. This approach aims to decrease unintentional damage to these branches, which could lead to excessive bleeding and compromise the visibility of the harvesting site.

Author Contributions

Ramtin Chitsazha: conceptualization, project administration, original draft writing, review, and editing. Negin Firouzi: review writing, and editing. Mohammad Mehdi Karimi Mazidi: data curation, photography collection, original draft writing, review, and editing.

Consent

Written informed consent was obtained from the patient before surgery to publish this case report and accompanying images.

Data Availability Statement

Data sharing does not apply to this article, as no datasets were generated or analyzed during the current study.

Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] Fathiazar A, Shariatmadar Ahmadi R, Sayar F. A Comparison between Mucoderm® and Connective Tissue Graft for Root Coverage. *J Dent Shiraz Univ Med Sci.* 2022; 23(Supplement-September-2022): 402-409.
- [2] Zucchelli G, Tavelli L, McGuire MK, Rasperini G, Feinberg SE, Wang HL, et al. Autogenous soft tissue grafting for periodontal and peri-implant plastic surgical reconstruction. *J Periodontol.* 2020; 91: 9-16.
- [3] Revathi, Pandurangan KK. Prevalence of Complications after Gingival Recession Coverage Procedure: A Retrospective Cohort Study. *Indian J Forensic Med Toxicology.* 2020; 14: 5310-5318.
- [4] Ranjbari A, Gholami GA, Amid R, Kadkhodazadeh M, Youssefi N, Mehdizadeh AR, et al. Clinical Comparison of Full and Partial Double Pedicle Flaps with Connective Tissue Grafts for Treatment of Gingival Recession. *J Dent Shiraz Univ Med Sci.* 2016; 17: 193-200.
- [5] Raoofi S, Asadinejad SM, Khorshidi H. Evaluation of Color and Width of Attached Gingiva Gain in Two Surgical Techniques: Free Gingival Graft and Connective Tissue Graft Covered By Thin Mucosal Flap, a Clinical Trial. *J Dent Shiraz Univ Med Sci.* 2019; 20: 224-231.
- [6] Thoma DS, Benić GI, Zwahlen M, Hämmerle CH, Jung RE. A systematic review assessing soft tissue augmentation techniques. *Clin Oral Implants Res.* 2009; 20 Suppl 4: 146-165.
- [7] Brasher WJ, Rees TD, Boyce WA. Complications of free grafts of masticatory mucosa. *J Periodontol.* 1975; 46: 133-138.
- [8] Griffin TJ, Cheung WS, Zavras AI, Damoulis PD. Post-operative complications following gingival augmentation procedures. *J Periodontol.* 2006; 77: 2070-2079.
- [9] Farnoush A. Techniques for the protection and coverage of the donor sites in free soft tissue grafts. *J Periodontol.* 1978; 49: 403-405.
- [10] Kulkarni MR, Thomas BS, Varghese JM, Bhat GS. Platelet-rich fibrin as an adjunct to palatal wound healing after harvesting a free gingival graft: A case series. *J Indian Soc Periodontol.* 2014; 18: 399-402.
- [11] Kulkarni MR, Shettar LG, Bakshi PV, Nikhil K. Palatal pre-suturing for perioperative hemostasis at free gingival graft donor sites: A randomized, controlled clinical trial. *J Periodontol.* 2021; 92: 1441-1447.
- [12] Harris RJ, Miller R, Miller LH, Harris C. Complications with surgical procedures utilizing connective tissue grafts: a follow-up of 500 consecutively treated cases. *Int J Periodontics Restorative Dent.* 2005; 25: 449-459.
- [13] Reiser GM, Bruno JF, Mahan PE, Larkin LH. The subep-

- ithelial connective tissue graft palatal donor site: anatomic considerations for surgeons. *Int J Periodontics Restorative Dent.* 1996; 16: 130-137.
- [14] Kim DW, Tempiski J, Surma J, Ratusznik J, Raputa W, Świerczek I, et al. Anatomy of the greater palatine foramen and canal and their clinical significance in relation to the greater palatine artery: a systematic review and meta-analysis. *Surg Radiol Anat.* 2023; 45: 101-119.
- [15] Tavelli L, Barootchi S, Ravidà A, Oh TJ, Wang HL. What Is the Safety Zone for Palatal Soft Tissue Graft Harvesting Based on the Locations of the Greater Palatine Artery and Foramen? A Systematic Review. *J Oral Maxillofac Surg.* 2019; 77: 271.
- [16] Greenstein G, Cavallaro J, Tarnow D. Practical application of anatomy for the dental implant surgeon. *J Periodontol.* 2008; 79: 1833-1846.