Root Coverage Procedure With Connective Tissue Graft Harvested From a Distal Wedge: A Case Report

Chin-Wei Wang,*† Chia-Cheng Li,* Walter Krawczyk,* and David M. Kim*

Introduction: This case report illustrates the use of a connective tissue (CT) graft harvested from a distal wedge procedure for root coverage. The retromolar area could be an alternative donor site, especially when a distal wedge procedure is planned. This approach offers an alternative CT donor site for the treatment of a localized gingival recession (GR).

Case Presentation: A healthy 22-year-old female patient presented with a localized Miller Class II GR defect on a mandibular incisor (tooth #25) caused by trauma from a lip piercing. Probing depths of 6 mm were also noted bilaterally over the distal aspect of the mandibular second molars. A root coverage procedure was performed, together with a distal wedge procedure for pseudopocket reduction. A CT graft harvested from a distal wedge was used for the root coverage. Complete root coverage with stable follow-up was documented up to 2 years, 5 months. Tissue from a contralateral distal wedge was submitted for histologic evaluation. Histopathologic examination showed dense collagenous fibrous tissue with no inflammatory infiltrates.

Conclusions: Localized GR can be treated with a CT graft harvested from a distal wedge without significant inflammation. The mandibular retromolar area may serve as an alternative viable donor site in selected cases. *Clin Adv Periodontics* 2016;6:134-139.

Key Words: Connective tissue; gingival recession; histology; periodontics; surgical procedures, operative; tooth root.

Background

Severe gingival recession (GR) with mucogingival defects may result in difficult plaque control, root hypersensitivity, and an unesthetic appearance.[1] Several approaches were developed to manage GR, including the lateral sliding flap; the double papilla flap; the envelope technique; and graft materials used in combination with advanced flap procedures.[2] An autogenous subepithelial connective tissue (CT) graft–based root coverage procedure is still considered the gold standard that gives the most predictable outcome.[2,3]

A subepithelial CT graft is commonly obtained from the hard palatal mucosa,[2-4] which may be close to vital structures, leading to complications and discomfort. Although surgical techniques have evolved to minimize morbidities for patients, seeking a better alternative donor source is still of interest. The tuberosity is one of the candidate sites because of its thickness and the potential for fewer complications for the patients.[5-8] In addition to the maxilla, the retromolar area of the mandible could be another viable target, especially when the ramus is not close to the molars and a deep pseudopocket is in need of treatment. Fewer surgical sites would decrease the morbidity and increase patients' acceptance of treatment.

This case report introduces an approach of combining a distal wedge procedure with CT harvesting and demonstrates its successful use in a root coverage procedure with

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long-term stability. A histopathologic analysis of the CT graft is also described.

Clinical Presentation

A healthy 22-year-old female was referred to the Harvard Dental Center (Boston, Massachusetts) in April 2012 for the treatment of localized GR on her mandibular right central incisor, which was caused by trauma from a lip piercing.

A comprehensive periodontal examination revealed a narrow GR over the midfacial surface of tooth #25 with heavy plaque and calculus deposition (Fig. 1). In addition, probing depths of 6 mm were detected distal to the bilateral second mandibular molars. The patient had a dental history of third molar extractions. Radiographs revealed periodontal ligament widening on tooth #25 with limited bone loss (Fig. 2), which gave the diagnosis of Miller[9] Class II facial GR for tooth #25 with trauma from occlusion and suprabony pseudopockets for retromolar areas.

Case Management

The treatment plan was discussed, and a root coverage procedure for tooth #25 and bilateral distal wedge surgeries for pocket reduction were determined with the patient's written consent. It was further decided to combine the root coverage procedure with a distal wedge of tooth #31 to take advantage of harvesting the CT at the same time. This combined approach was developed and has been successfully implemented in the author's office (WK) for several decades.

The lip ring was removed before the initial periodontal treatment, and heavy contact was adjusted over tooth #25. On the day of surgery, after local anesthetics were administered, the recipient site was first prepared with a tunneling technique and repeated root planing. A distal wedge procedure was performed together with surgical debridement of the distal surface of tooth #32 (Fig. 3a). The CT was dissected from the retromolar epithelium and saved for later use (Fig. 3b). This alternative distal wedge approach[10] also preserved a wider area of keratinized tissue (KT). A frenectomy was performed before insertion of the graft to avoid unnecessary tissue pull during the healing process (Fig. 4a). Because the CT graft was stable and adapted, only one suture (chromic gut) was placed at the apical side of the graft to secure it. Mesial unilateral sliding pedicle flap was used for direct approximation of the cleft with an interrupted sutured (Fig. 4b). After 2 weeks, the healing was uneventful, and the tissue showed great integration (Fig. 5a).

FIGURE 1 Clinical examination demonstrated a localized narrow GR on the facial aspect of tooth #25.

Clinical Outcomes

After 1 month, the wound was fully healed with complete root coverage. Significant width of KT was also developed after healing. After 2 years and 5 months, the result was stable and esthetically satisfactory (Fig. 5b).

Histopathology

A distal wedge procedure was performed on tooth #18 during a separate visit, and the subepithelial tissue was submitted for histopathologic evaluation.

The sections consisted of fragments of densely collagenous CT covered by moderately orthokeratinized and parakeratinized stratified squamous epithelium (Figs. 6a and 6b). No significant inflammatory infiltrate was observed (Fig. 6c).

Discussion

This case report demonstrates the successful use of a subepithelial CT graft from a distal wedge procedure for complete root coverage. The CT graft was integrated with

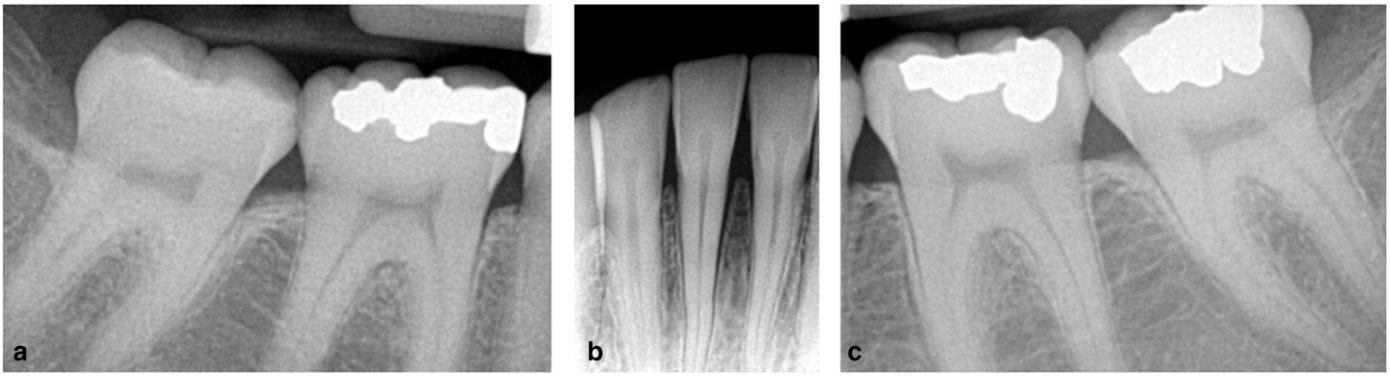

FIGURE 2 Radiographs revealed normal crestal bone levels. **2a** The retromolar area of tooth #31 served as the donor site for the CT graft. **2b** The recipient site revealed no interproximal bone loss. **2c** Contralateral distal wedge tissue was submitted for histopathologic analysis.

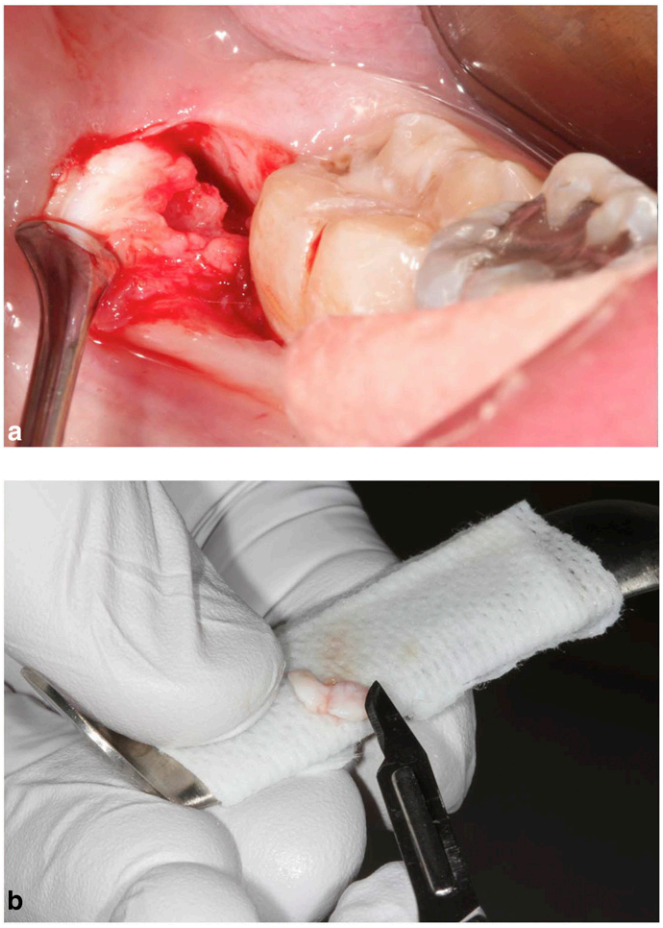

FIGURE 3a A distal wedge procedure for pseudopocket reduction was performed together with CT graft harvesting. **3b** Tissue was cut in half and spread out to extend its width.

a unilateral sliding pedicle flap to increase significant KT, and the clinical outcome was documented to be stable for 2 years, 5 months.

If the patient could keep the recession area plaque free without damaging the gingiva, a more conservative alternative treatment option may be to maintain the site without surgical intervention. However, after initial periodontal treatment including patient education, the patient still demonstrated difficulty in maintaining such narrow GR. Therefore, periodontal plastic surgery for correcting the mucogingival defect was recommended.

With the proposed combined approach, additional surgical sites were avoided for the patient. If the mandibular ramus is distant to the molar and there is sufficient KT covering the retromolar area, this site may also offer fewer complications than the maxillary palate for harvesting CT. The only vital structure that should be noted is the lingual nerve that may reside deep in the lingual flap of the distal wedge.[11,12] Therefore, the incision of the distal wedge could be placed toward the disto-buccal area of the retromolar pad, and CT could be harvested more from the vestibular side. In this case, this patient reported minimal postoperative discomfort.

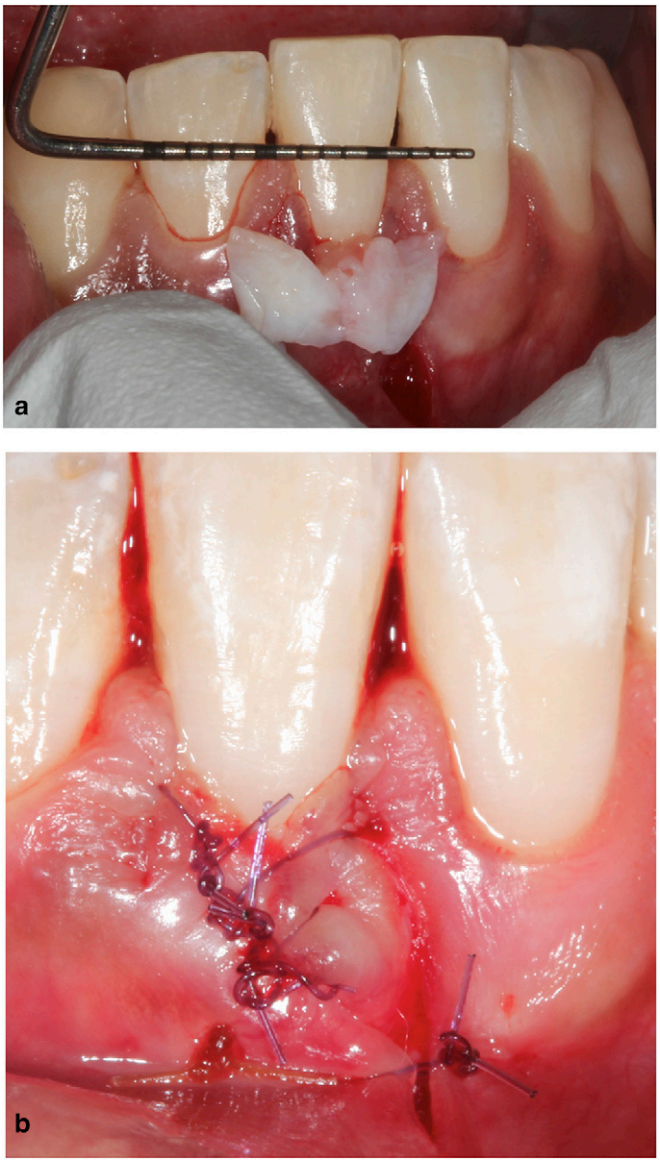

FIGURE 4 Management of the recipient site. **4a** Tunneling and frenectomy were done before inserting the graft. **4b** After stabilization of the graft and suturing.

Compared with the CT harvested from the maxillary tuberosity,[7] the mandibular retromolar area demonstrated denser collagen fibers with less vascularity. It is unknown whether the history of third molar extraction would affect the nature of the tissue. In this case, no significant clinical and histologic evidence of inflammation was noted within the tissue.

Because one of the limitations of this approach is the volume of the tissue available, only localized narrow GR is an ideal candidate. However, each patient may have their own niche for tissue harvesting. The mandibular retromolar area should also be an alternative option, especially when pseudopockets are present.

With proper case selection, CT graft harvested from a mandibular distal wedge may serve as a viable donor site for a root coverage procedure. A larger clinical trial is needed to evaluate patient comfort and predictability of this approach. ■

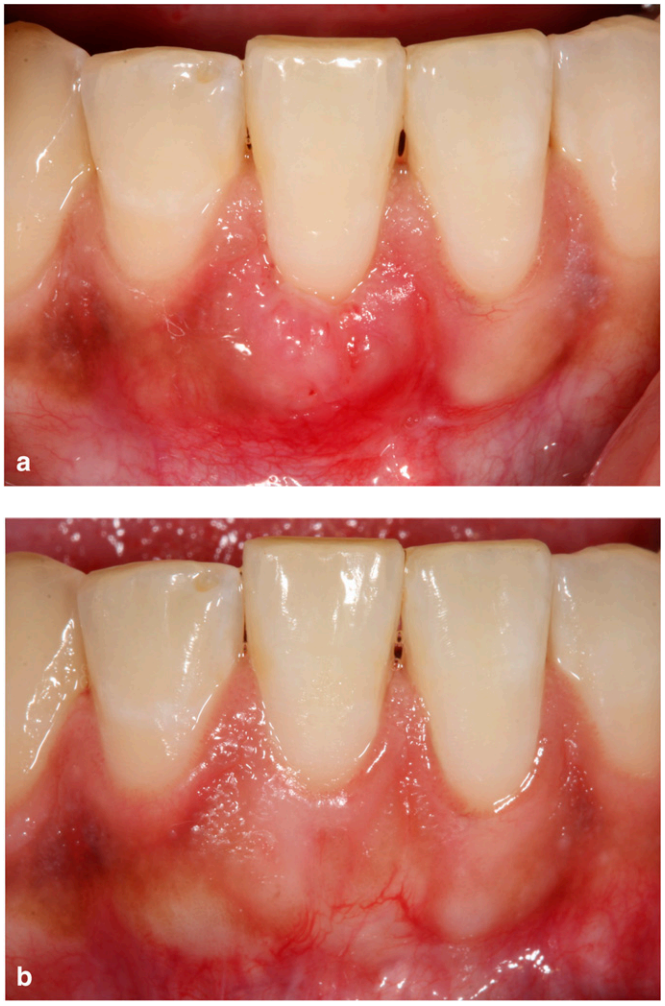

FIGURE 5 Complete root coverage and long-term stability of the successful outcome. **5a** Healing 2 weeks after surgery. **5b** Two-year, 5-month follow-up.

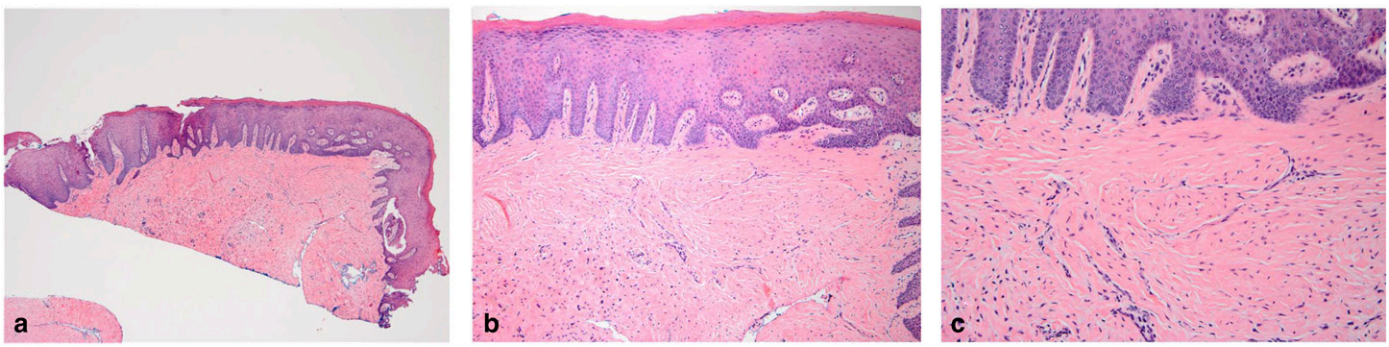

FIGURE 6 Histopathologic evaluation of the graft tissue harvested from the retromolar region (hematoxylin and eosin). **6a** Sections consisted of fragments of densely collagenous fibrovascular tissue (original magnification ×40). **6b** The fibrous CT was covered by orthokeratinized and parakeratinized stratified squamous epithelium (original magnification ×100). **6c** There was insignificant underlying inflammation in the CT (original magnification ×400).

Summary

Why is this case new information?	■ A CT graft harvested from a mandibular distal wedge procedure as a new, alternative approach to root coverage
What are the keys to successful management of this case?	■ Case selection ■ Removal of the etiology ■ Thorough root surface debridement ■ Surgical techniques
What are the primary limitations to success in this case?	■ Limited volume of the graft ■ The nature of the deep pockets distal to the molars

Acknowledgment

The authors report no conflicts of interest related to this case report.

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