# Treatment of Gingival Recession with Hypersensitivity using Connective Tissue Graft with a Single Incision Technique: A Case Report

Jun-Beom Park

Department of Periodontics, College of Medicine, The Catholic University of Korea, Seoul, Republic of Korea

## Abstract

**Introduction:** A single incision palatal harvest technique was applied to minimize the size of the palatal wound and to allow for primary closure of the donor site, which may result in reduced postoperative discomfort.

**Aim:** This case presentation describes the use of a coronally positioned flap with subepithelial connective tissue graft using a single incision technique for the treatment of dentin hypersensitivity and gingival recession.

**Materials and Methods:** A 40-year-old female patient presented for the resolution of dentin hypersensitivity associated with esthetic concerns in the lower right first premolar. A coronally positioned flap combined with a connective tissue graft using a single incision technique was used to achieve root coverage.

**Discussion and Conclusions:** This technique achieved resolution of dentin hypersensitivity and coverage of the root surface with healthy keratinized tissue. The single incision technique may be considered for harvesting the grafting material in the treatment of dentin hypersensitivity.

*Key Words: Dentin sensitivity; Gingival recession; Tissue transplantation*

## Introduction

Dentin hypersensitivity is characterized by exposed dentinal tubules most often due to gingival recession and loss of cementum through erosion, abrasion, or other factors [1]. The periodontitis with host response may serve as the potential etiology of gingival recession [2-3]. Patients looking for a decrease in root sensitivity, esthetic improvement, treatment or reduction of the risk of root caries and for restoration of the gingival margin to its normal contour and position can be treated with root coverage procedures [4].

The increasing interest in esthetics and the subsequent need to solve related problems such as hypersensitivity and root caries have favored the development of many surgical techniques that permit the coverage of exposed roots. Free gingival grafts, coronally advanced or laterally positioned flap, guided tissue regeneration, and subepithelial connective tissue grafts have been performed to achieve root coverage [5].

A single incision palatal harvest technique was applied to minimize the size of the palatal wound and to allow for primary closure of the donor site, which may result in reduced postoperative discomfort. However, there is a limited report on the reduction of dentin hypersensitivity using a single incision technique, whose follow-up period was 4 months [6].

The following case presentation describes the use of a coronally positioned flap with subepithelial connective tissue graft using a single incision technique for the treatment of dentin hypersensitivity and gingival recession.

## Case Presentation

A 40-year-old female with dentin hypersensitivity with esthetic concern visited the dental clinic. The patient had a non-contributory medical history. The patient did not have any medical conditions and was not taking any medications that were associated with a compromised, soft healing response. The patient had a Miller Class I recession defect of 5 mm on the mandibular right first premolar *(Figure 1A)*. The keratinized tissue on the buccal side was less than 1 mm and the clinical probing depths ranged from 2 to 3mm. The patient had tactile and air blast sensitivity and Schiff Air Index was 2. The patient was given a detailed explanation concerning the procedure, and informed consent was obtained from the patient.

Immediately before the procedure, the patient rinsed for two minutes with a 0.12% chlorhexidine digluconate solution (Hexamedine, Bukwang, Seoul, Korea). Following an injection of 2% lidocaine with 1:100,000 epinephrine local anesthetic, a partial-thickness flap was raised with two vertical incisions placed three to four mm wider mesio-distally than the area of gingival recession. The coronal margin of the flap was started with a horizontal sulcular incision to preserve all existing facial gingival. The proximal papillae were left intact and care was taken to extend the flap without perforations *(Figure 1B)*. Root planing was carried out until the root surfaces were hard and smooth to reduce the convexity.

The connective tissue graft was harvested from the palate between the distal aspect of the canine and the mesial region of the first molar with a single incision technique. Pressure was applied to the donor site with gauze soaked in saline after the graft was taken. The donor area was closed with absorbable sutures (Vicryl 4/0, Johnson and Johnson Medical Inc., Arlington, TX, USA) *(Figure 1C)*. A connective tissue graft in size of 10 mm of length and 4 mm of height was harvested and then the graft was trimmed to produce a uniform thickness of approximately 2 mm *(Figure 1D)*.

The connective tissue graft was positioned just apical to the cemento-enamel junction with the sutures. The remaining tissue of the anatomic interdental papillae was de-epithelialized and the overlying flap fully covered the donor tissue *(Figure 1E)*. Dry foil was applied to the recipient area and then a non-eugenol periodontal dressing (Coe-Pak, GC America, Alsip, IL) was placed over the dry foil to stabilize and protect the donor tissue for 8 days postoperatively.

Corresponding author: Jun-Beom Park DDS, MSD, PhD, Department of Periodontics, Seoul St Mary's Hospital, College of Medicine, The Catholic University of Korea 222 Banpo-daero, Seocho-gu, Seoul, 137-701, Republic of Korea, Tel: +82-2-2258-6290, Fax:+82-2-537-2374; e-mail: jbassoonis@yahoo.co.kr

The patient was given a cold compress extraorally to minimize swelling and bleeding. The patient was placed on amoxicillin 500 mg 3 times per day for 5 days, aceclofenac 100 mg 2 times per day for 5 days, and chlorhexidine digluconate 0.12% 3 times per day for 4 weeks. The patient was asked not to chew or brush the surgical area for the first four weeks postoperatively. Eight days after surgery, the periodontal dressing and any remaining sutures were removed, and the grafted area was carefully cleaned with a 0.12% chlorhexidine solution *(Figures 2A and 2B)*. The patient received oral hygiene instructions and was shown how to achieve a roll-stroke brushing technique. The patient was seen regularly to monitor healing and plaque control.

The final evaluation at 18 months after surgery showed good color blending of the treated area with the adjacent soft tissue *(Figure 2C)*. The reduction of sensitivity was maintained up to the final examination with 2.0 mm increase in the keratinized tissue *(Table 1)*.

*Table 1. Clinical measurements at baseline and 18 months post-surgery.*

| | Gingival recession (mm) | Clinical attachment level (mm) | Keratinized tissue (mm) | Probing depth (mm) | Sensitivity scale (0-3) [18] |
|---|---|---|---|---|---|
| Baseline | 5 | 8.3 | 1 | 3.3 | 2 |
| 18 months follow-up | 1.5 | 4.1 | 3 | 2.6 | 0 |

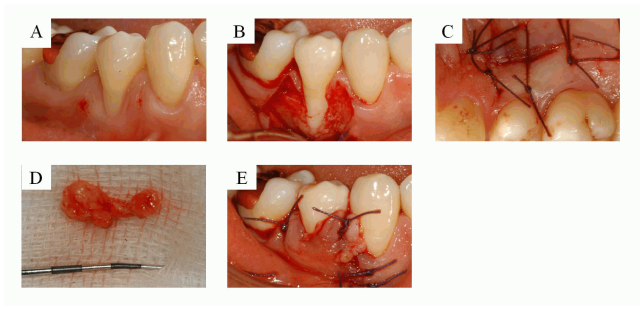


*Figure 1. A. Buccal view before treatment showing a single recession defect on the lower right premolar. A small amount of keratinized tissue remains apical to the exposed root; B. A split-thickness trapezoidal flap was elevated; C. The donor area was closed with absorbable sutures; D. A connective tissue graft in size of 10 mm of length and 4 mm of height was harvested from the palate with the single incision technique; E. The covering flap is advanced and sutured coronally to the cementoenamel junction.*

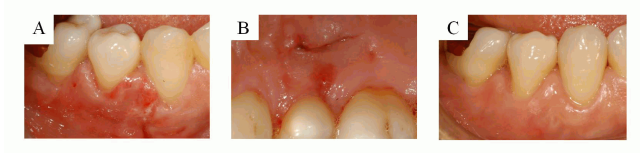


*Figure 2. A. Clinical view eight days after the surgery showing complete root coverage; B. An eight-day postoperative view of the recipient site showing the healing state; C. Clinical view at one and a half years postoperative, showing a good esthetic outcome.*

## Discussion

The goal of this case report was to describe the application of a connective tissue graft using a single incision technique for the treatment of dentin hypersensitivity combined with gingival recession. The reduction of sensitivity was maintained up to 16 months with 4.2 mm in the increase of clinical attachment level.

The prevalence of dentin hypersensitivity is between 60 and 98 percent in patients with periodontitis [7]. However, a majority of patients do not seek treatment to desensitize their teeth because they do not perceive dentin hypersensitivity to be a severe oral health problem [8]. Randomized clinical trial for the treatment of gingival recession associated with non-carious cervical lesions by coronally advanced flap alone or in combination with a resin-modified glass ionomer restoration was done and it was reported that both procedures produced similar soft tissue coverage after six months. A greater reduction in dentin sensitivity was seen in coronally advanced flap in combination with glass ionomer [9]. In this report, restorative materials were not used because there was no severe cervical lesion and this procedure may take additional time and costs.

When epithelium is removed from the palate, it is very difficult to cover the area due to the rigidity of the tissue and this area may be healed by secondary intention [10]. A trap-door approach may have a disadvantage of interrupting the vascular supply to the overlying tissue as a result of the use of vertical incisions [11]. In this case, the connective tissue graft was harvested with a single incision palatal harvest technique. This approach may minimize the size of the palatal wound and allow for primary closure of the donor site, which may result in reduced postoperative pain [12]. This approach may give additional advantages by eliminating the need for the postoperative stent, sutures or hemostatic agents [11].

Adequate blood supply from the tissues adjacent to the graft bed seems to be the single most important factor for the survival of the grafted tissue over the avascular root surface [13]. Coronal displacement of the flap requires its relaxation and a passive adaptation without tension over the cementoenamel junction [14]. In this report, the recipient area was carefully evaluated before suturing because increased tension may cause impaired esthetics, disturb the initial wound healing, and result in less root coverage [15].

The defect coverage at the final examination showed that 2.0 mm increase of keratinized tissue was achieved. The increase of keratinized tissue may make plaque control more effective [16], and this may be more resistant to the future gingival recession caused by injuries from traumatic tooth brushing or inflammatory reactions [17].

## Conclusion

A coronally positioned flap combined with a connective tissue graft using a single incision technique was used to treat dentin hypersensitivity associated with esthetic concern. This technique achieved healthy keratinized tissue, coverage of the root surface, and resolution of hypersensitivity of the root. The single incision technique may be considered for

harvesting the grafting material in the treatment of dentin hypersensitivity.

## Acknowledgements

This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Science, ICT & Future Planning (NRF-2014R1A1A1003106).

### References

1. Bartold PM. Dentinal hypersensitivity: a review. *Aust Dent J.* 2006; **51**: 212-218; quiz 276.

2. Fickl S, Fischer KR, Jockel-Schneider Y, Stappert CF, Schlagenhauf U, Kebschull M. Early wound healing and patient morbidity after single-incision vs. trap-door graft harvesting from the palate--a clinical study. *Clin Oral Investig.* 2014; **18**: 2213-2219.

3. Matarese G, Isola G, Anastasi GP, et al. Transforming growth factor beta 1 and vascular endothelial growth factor levels in the pathogenesis of periodontal disease. *Int J Mol Med.* 2013; **11**: 479-488.

4. Harris RJ. Creeping attachment associated with the connective tissue with partial-thickness double pedicle graft. *J Periodontol.* 1997; **68**: 890-899.

5. Al-Zahrani MS, Bissada NF. Predictability of connective tissue grafts for root coverage: clinical perspectives and a review of the literature. *Quintessence Int.* 2005; **36**: 609-616.

6. Hurzeler MB, Weng D. A single-incision technique to harvest subepithelial connective tissue grafts from the palate. *Int J Periodontics Restorative Dent.* 1999; **19**: 279-287.

7. Chabanski MB, Gillam DG, Bulman JS, Newman HN. Prevalence of cervical dentine sensitivity in a population of patients referred to a specialist Periodontology Department. *J Clin Periodontol.* 1996; **23**: 989-992.

8. Gillam DG, Seo HS, Bulman JS, Newman HN. Perceptions of dentine hypersensitivity in a general practice population. *J Oral Rehabil.* 1999; **26**: 710-714.

9. Santamaria MP, Suaid FF, Casati MZ, Nociti FH, Sallum AW, Sallum EA. Coronally positioned flap plus resin-modified glass ionomer restoration for the treatment of gingival recession associated with non-carious cervical lesions: a randomized controlled clinical trial. *J Periodontol.* 2008; **79**: 621-628.

10. Harris RJ. A comparison of two techniques for obtaining a connective tissue graft from the palate. *Int J Periodontics Restorative Dent.* 1997; **17**: 260-271.

11. Liu CL, Weisgold AS. Connective tissue graft: a classification for incision design from the palatal site and clinical case reports. *Int J Periodontics Restorative Dent.* 2002; **22**: 373-379.

12. Wessel JR, Tatakis DN. Patient outcomes following subepithelial connective tissue graft and free gingival graft procedures. *J Periodontol.* 2008; **79**: 425-430.

13. Camargo PM, Melnick PR, Kenney EB. The use of free gingival grafts for aesthetic purposes. *Periodontol.* 2000 2001; **27**: 72-96.

14. Pini Prato G, Pagliaro U, Baldi C, et al. Coronally advanced flap procedure for root coverage. Flap with tension versus flap without tension: a randomized controlled clinical study. *J Periodontol.* 2000; **71**: 188-201.

15. Tozum TF, Keceli HG, Guncu GN, Hatipoglu H, Sengun D. Treatment of gingival recession: comparison of two techniques of subepithelial connective tissue graft. *J Periodontol.* 2005; **76**: 1842-1848.

16. Maksoud MA. Manipulation of the peri-implant tissue for better maintenance: a periodontal perspective. *J Oral Implantol.* 2003; **29**: 120-123.

17. Paolantonio M, Dolci M, Esposito P, et al. Subpedicle acellular dermal matrix graft and autogenous connective tissue graft in the treatment of gingival recessions: a comparative 1-year clinical study. *J Periodontol.* 2002; **73**: 1299-1307.

18. Schiff T, Bonta Y, Proskin HM, DeVizio W, Petrone M, Volpe AR. Desensitizing efficacy of a new dentifrice containing 5.0% potassium nitrate and 0.454% stannous fluoride. *Am J Dent.* 2000; **13**: 111-115.