

# Coronally Advanced Flap with Connective Tissue Graft for Covering the Uncovered-A Case Report

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## ABSTRACT

Tooth malposition is an important cause of gingival recession. Teeth that are labially rotated or tilted have thinner labial bony plate that is located further apically than adjacent teeth. Gingival margin also recedes to follow the contour of the bone which leads to root exposure causing compromised aesthetics, dentinal hypersensitivity and, carious and non-carious cervical lesions. Such defects if left untreated may exacerbate the condition causing premature loss of specific tooth/teeth. Therefore, periodontal and orthodontic treatment both is needed. However, orthodontic treatment on tooth with thin gingival tissue and recession may further deteriorate the periodontal tissue. Therefore, periodontal preparation before orthodontic treatment is essential to support the periodontal structures. Such periodontal defects can be corrected by gingival augmentation. Coronally advanced flap with connective tissue graft provides the most favorable clinical outcome. Thus, this combination is considered as the reference therapy for covering the exposed root surface.

**KEYWORDS:** Connective tissue graft; Coronally advanced flap; Gingival augmentation; Gingival recession; Tooth malposition.

## INTRODUCTION

Teeth that are tilted or rotated have thinner labial bony plate that is located further apically than on the adjacent teeth. The gingival margin also gets recessed apically to follow the bone that leads to the exposure of the root which is termed as gingival recession (GR). The GR increases the hard tissue surface area that acts as a substrate for plaque formation as compared with enamel. It may leads to compromised aesthetics, dentinal hypersensitivity, and carious and non-carious cervical lesions.<sup>1</sup> Such defects can be corrected by interdisciplinary approach integrating periodontal and orthodontic treatment to correct the gingival anatomy and tooth position, respectively.<sup>2</sup>

## CASE REPORT

A 25-year-old male was referred from Department of Orthodontics to Department of Periodontics for management of gingival recession as a preorthodontic periodontal therapy. On examination, there was upper and lower anterior teeth crowding (Fig.1A). In relation to (i.r.t.) 42, there was disto-labial inclination with 7 mm recession depth, thin gingival tissue, inadequate keratinised tissue width (KTW) with exposed CEJ, no step deformity and mobility (Fig.1B) with no radiographic abnormality (Fig.1C). Other areas of mouth were periodontally healthy. So, based on 2017 classification of phenotype and GR, diagnosis of mucogingival deformity recession type-1 (RT-1) i.r.t. 42 was made and the case was planned for augmenting the width and the thickness of keratinized gingiva (KG).



Figure 1. Pre-operative view: 1A-anterior crowding, 1B-recession depth of 7 mm, 1C-intraoral periapical radiograph

Patient was explained about the treatment options with the use of free soft tissue autograft. After taking the consent, transgingival probing was done under local anaesthesia to measure the soft tissue thickness of palate adjacent to 24-26. It was 4 mm which was adequate for harvesting connective tissue graft (CTG). Therefore, the case was planned for augmenting the KTW as well as root coverage (RC) by coronally advanced flap (CAF) with CTG. Full mouth scaling was performed and impression of upper arch was made for fabrication of acrylic stent. Patient was recalled after 4-weeks with routine blood investigation report.

Under right mental nerve block (2% Lignocaine in 1:200000 adrenaline), a partial-thickness recipient site was prepared (no.15-scalpel blade) by two horizontal incisions at the level of CEJ extending 3 mm each side (mesially and distally) from the line angle of 42; and two vertical incisions extending 5 mm beyond the most apical part of the exposed root (Fig.2A). De-epithelization of interdental papilla was done followed by root planing with Gracey curette #1-2 and, root-biomodification with doxycycline solution (100mg/ml) for 3 minutes with cotton pledget to improve the chances of accepting the new attachment of gingival tissues.<sup>3</sup>

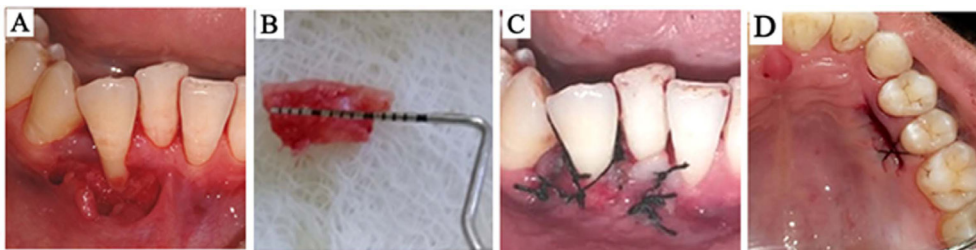


Figure 2. Intra-operative view: 2A- recipient site, 2B- CTG with epithelium at the edge, 2C- sutured recipient site with CAF and CTG, 2D- sutured donor site

The CTG was harvested from palate by Bruno technique.<sup>4</sup> Under left greater palatine nerve block, primary horizontal incision of partial-thickness corresponding to the length of recipient site was made 5 mm apical to GM and parallel to the long axis of 24-25. Secondary horizontal incision of full-thickness was made 2 mm coronal and parallel to primary incision and perpendicular to palate. The vertical incisions were given at mesial and distal end within the connective tissue. At apical area, mesio-distal horizontal incision was given to separate the connective tissue from palatal flap. A small periosteal elevator was inserted into the secondary incision area and is continued apically until it meets the base of the primary incision, and then CTG was separated from the palate. A few millimeters of epithelium were left on the edge of CTG (Fig.2B) to facilitate the suturing of graft to the recipient site. The CTG was then placed over normal saline-moistened gauze. Bleeding from the donor site was arrested with pressure pack and then acrylic stent was placed.

The CTG was thinned with no.15-scalpel blade to

remove glandular and fatty tissue thus obtaining a graft of about 1.5 mm thickness. The CTG was placed at recipient site and then covered with outer portion of the partial-thickness flap by advancing it coronal to CEJ. It is then stabilized with 4-0 silk suture with interrupted and criss-cross suturing technique (Fig.2C). Pressure was applied over graft with moistened gauze for 5 minutes to permit thin fibrin clot formation and prevent dead space. Sterile foil was placed over surgical site and periodontal dressing was applied. Suturing was also done at donor site with cross horizontal mattress technique (Fig.2D). Post-surgical instructions were given and patient was recalled after 2-weeks.

After 2-weeks, periodontal dressing and sutures were removed. Patient was advised to maintain oral hygiene. Patient was followed up at 1, 3 and 6-months postoperatively which showed reduction in the recession depth by 1, 3 and 4 mm (Fig.3A, 3B, 3C), respectively. Patient was then referred back to Department of Orthodontics.



Figure 3. Post-operative view at: 3A- 1 month, 3B-3 months, 3C-6 months interval

## DISCUSSION

Gingival recession is the most common and undesirable condition of gingiva.<sup>3</sup> It has the prevalence rate of 65.44% in Nepal.<sup>5</sup> One among the most common aetiologies of GR is the tooth/teeth malposition which if left untreated may exacerbate the condition causing premature loss of specific tooth/teeth.<sup>3</sup> However, orthodontic movement in thin gingival tissue with inadequate/absent KTW both of which was evident in the present case may further deteriorate periodontal tissues.<sup>6</sup> Therefore, periodontal preparation was required to support the periodontal structures thereby permitting successful tooth movement without further attachment loss.<sup>3</sup>

The present case was diagnosed as mucogingival deformity RT-1 in relation to 42 in which studies have shown 100% RC.<sup>7</sup> The various techniques proposed for treatment of RC includes displaced flap (lateral displaced flap, coronally advanced flap or, apical positioned flap) with or without soft tissue autograft (epithelial or, CTG), guided tissue regeneration, acellular dermal matrix, etc.<sup>3</sup>

The CAF is as an effective and predictable technique for RC in RT-1 and 2.<sup>8</sup> The CTG technique described by Edel is based on the fact that connective tissue carries the genetic message for the overlying epithelium to become keratinized.<sup>3</sup> Its advantages are: donor tissue is obtained from the undersurface of the palatal flap, which is sutured back with primary closure; healing is by primary intention; less discomfort postoperatively at the donor site; improved aesthetics, etc.<sup>3</sup>

In a systematic review, this combination has shown 84.7% mean RC and 51.8% sites with complete RC in 28 randomized control trials.<sup>9</sup> It is effective for single/multiple GR even after 7-years of follow-up.<sup>10</sup> Therefore, the present case was planned for CAF with CTG for augmenting width and thickness of KG. At 6-months follow-up, recession depth was reduced from 7 mm to 3 mm (57% RC achieved). The complete RC could not be achieved because of disto-labial inclination of 42 which needs orthodontic intervention as well.<sup>2</sup> Thereafter, the patient was referred back to Department of Orthodontics for further treatment.

## CONCLUSION

The CAF with CTG has resulted in increased keratinized gingiva both in width and thickness which suffice the pre-requisite for initiating orthodontic movement.

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## REFERENCES

1. Cortellini P, Bissada NF. Mucogingival conditions in the natural dentition: Narrative review, case definitions, and diagnostic considerations. *J Clin Periodontol.* 2018;45:S190–8.
2. Caton JG, Armitage G, Berglundh T, Chapple ILC, Jepsen S, Kornman KS, et al. A new classification scheme for periodontal and peri-implant diseases and conditions - Introduction and key changes from the 1999 classification. *J Clin Periodontol.* 2018;45.
3. Newman MG, Takei HH, Klokkevold PR, Carranza FA. *Newman and Carranza's Clinical Periodontology*, 13th edition. Elsevier; 2018.
4. Bruno JF. Connective tissue graft technique assuring wide root coverage. *Int J Periodontics Restorative Dent.* 1994;14(2):126–37.
5. Humagain M, Kafle D. The Evaluation of Prevalence, Extension and Severity of Gingival Recession among Rural Nepalese Adults. *Orthod J Nepal.* 2013;3(1):41–6.
6. Kim DM, Neiva R. Periodontal soft tissue non-root coverage procedures: a systematic review from the AAP Regeneration Workshop. *J Periodontol.* 2015;86(2 Suppl):S56–72.
7. Jain S, Kaur H, Aggarwal R. Classification systems of gingival recession: An update. *Indian J Dent Sci* 2017;9:52-9.
8. Cairo F, Pagliaro U, Nieri M. Treatment of gingival recession with coronally advanced flap procedures: a systematic review. *J Clin Periodontol.* 2008;35(8 Suppl):136–62.
9. Cairo F. Periodontal plastic surgery of gingival recessions at single and multiple teeth. *Periodontology* 2000, 2017;75(1), 296–316.
10. Iorio-Siciliano V, Blasi A, Cuzzo A, Vaia E, Isola G, Ramaglia L. Treatment of gingival recessions using coronally advanced flap and connective tissue graft: a long-term retrospective analysis. *Quintessence Int Berl Ger* 1985. 2021;52(8):686–93.