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Case Report

Surgical management of RT2 gingival recession using sub epithelial connective tissue graft and coronally advanced flap: A case report

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ABSTRACT

Introduction: Apical migration of the gingival fiber attachment and marginal gingiva leads to gingival recession and can be caused due to many factors such as faulty tooth brushing, masochistic habits, periodontal disease etc. This causes dentinal hypersensitivity, aesthetic problems, root caries, cervical abrasion, and difficulty in maintaining oral hygiene and often possess a challenging situation for the clinician to deliver best care to the patients. This case reports about the use of SCTG along with coronally advanced flap.
Purpose: To report a case of RT2 recession, older term – Millers Class II recession which showed promising result when root coverage procedure was done using sub-epithelial connective tissue and coronally advancing the flap.
Case Report: A 62-year-old male patient was referred to the Department of Periodontology, with a chief complaint of hypersensitivity and downward shifting of gum in upper front left teeth region which was progressive in nature with no obvious medical history.
Materials and Methods : After achieving profound anaesthesia over the concerned region the recipient site was prepared. After which the donor tissue was retrieved from the palatal area using trap door method and placed over the recipient site. No root biomodification agents were used. The graft was stabilised using interrupted suture and then criss-cross suturing was done, and non-eugenol periodontal dressing was given.
Results: The follow up results showed good outcome with predictable root coverage achieved using Sub-epithelial Connective Tissue Graft (SCTG) and coronally advanced flap in the canine region which is often the most difficult one to achieve complete root coverage because of canine prominence.
Conclusion: SCTG can be used successfully along with coronally advanced flap and clinicians must opt for such treatment modalities for patients benefit.

1. Introduction

Gingival recession as reported by GPT- glossary of Periodontic terms are often defined as displacement of the soft tissue margin apical to the cemento-enamel junction.[1] There are many etiological factors related to this condition like plaque induced periodontal disease, faulty tooth brushing technique, movements due to orthodontic force, faulty restorations, and various anatomic factors like malposition, frenum pull, etc. Outcome of the root coverage

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procedure can be predicted based on case to case, and it is integral that the dentist should inform the patient accordingly. It may be localized to one tooth or generalized throughout the mouth.

There are various grafting procedures delineated in dental literature which has given excellent outcome and includes autogenous gingival grafting or Acellular dermal matrix graft (ADMG)/Enamel matrix derivative (EMD) so as to increase the attached gingiva width.[2] Root coverage procedures must be undertaken especially when the recession is deep and marginal tissue health cannot be sustained. There are many problems associated with gingival recession such as aesthetics, hypersensitivity, a greater incidence of root caries and poor plaque control hence calling for the different treatment modalities.[3]

There have been many modalities used to treat gingival recession such as free soft tissue graft procedures like free gingival graft and sub-epithelial connective tissue graft, pedicle soft tissue graft rotational flap and flap advancement, pouch and tunnel and GTR.

Sub-epithelial connective tissue grafts (SCTG) have been immensely utilized by periodontists to reinforce edentulous ridges, to increase width of attached gingiva, and to hide exposed roots with successful attempts.[4] Free gingival grafts also give good predictable outcome to reinforce attached gingiva and canopy the denuded root surfaces, however, there are few limitations of the same such as colour mismatch, malalignment of muco-gingival junction formation and hulking looking, and hence SCTG has been found to be superior to FGG.

In November 2017, the new AAP Periodontal Classification was adapted by the efforts of the World Workshop on the Classification of Periodontal and Peri-implant Diseases and Conditions, held at Chicago.[5] It jointly created a consensus knowledge of foundation for a new classification to be adapted across the globe.

As per the new classification, it mandates the use of classification given by Francesco Cairo (2011).

Cairo et al. (2011)[6] classified gingival recession based on the assessment of CAL at both buccal and interproximal sites.

Recession Type 1 (RT1): Gingival recession with no loss of interproximal attachment. Interproximal CEJ clinically not detectable at both mesial and distal aspects of the tooth

Recession Type 2 (RT2): Gingival recession associated with loss of interproximal attachment. The amount of interproximal attachment loss (measured from the interproximal CEJ to the depth of the interproximal pocket) is less than or equal to the buccal attachment loss (measured from the buccal CEJ to the depth of the buccal pocket)

Recession Type 3 (RT3): Gingival recession associated with loss of interproximal attachment. The amount of interproximal attachment loss (measured from the interproximal CEJ to the depth of the pocket) is higher than the buccal attachment loss (measured from the buccal CEJ to the depth of the buccal pocket).

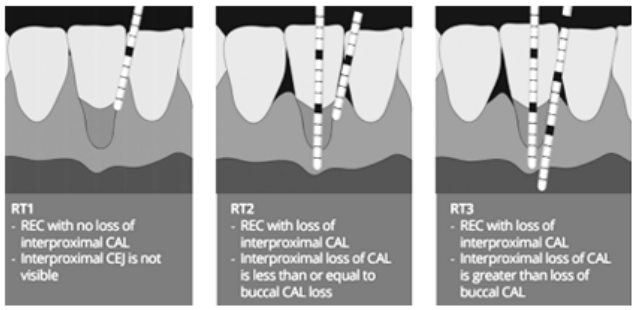

Fig. 1: Classification for Gingival recession byCairo et al. 2011.[6]

2. Aim

The purpose of this article is to delineate a case report pertaining to RT2 gingival recession of maxillary canine #23 (FDI Numbering system)/#11 (Universal Numbering system) using subepithelial connective tissue graft along with coronally advancement of the flap and gaining sufficient and predictable good root coverage.

3. Case History

A 62-year-old male patient was referred to the Department of Periodontology, with a chief complaint of hypersensitivity and downward shifting of gum in upper front left teeth region which was progressive in nature (Figure 1). Medical history revealed no obvious finding. During 1st visit, full mouth scaling was done, and patient was demonstrated with the modified Stillman's method of toothbrushing.

The recession was 'U' type[7] recession with more than 4mm apico-coronal height and 7mm mesio-distal width at greatest dimension (Figures 2 and 3). Class V cavity was restored using GIC. The single-stage surgical technique using Sub-epithelial connective tissue autograft was discussed with the patient on the same day and a written informed consent was taken. Patient was explained about the associated complications as well and patient opted to continue with the treatment.

The sub-epithelial connective tissue grafts procedure was given by Bjorn in 1963, and Sullivan and Atkins in 1968 delineated it and the main purpose of this graft was to increase the width of attached gingival and extend the depth of vestibule, however in recent years it is only used as a modality to cover the exposed root surfaces and to increase the width of attached gingiva having a predictable outcome.[8,9]

The indications of root coverage procedure are as follows:[10]

1. To augment the width of keratinized attached gingival tissue.
2. To canopy the exposed roots particularly in cases with receded gingiva.
3. To augment the thickness and volume of gingiva in edentulous spaces and to augment the vestibular depth.

3.1. Steps/ Procedure preparation of recipient site

After extraoral scrubbing with Betadine, the area in the region of #23 (FDI Numbering system)/#11 (Universal Numbering system) was anaesthetized by using local infiltration technique with 2% Lignocaine HCl + 1:2,00,0000 epinephrine. De-epithelialization was carried out with marginal and peripheral gingival tissue. After local anaesthesia and intraoral disinfection with 0.2% chlorhexidine mouth rinse, the exposed root surfaces were planed thoroughly using Gracey curette.

The preparation involved a crevicular incision which was merged into vertical incisions in the papillary area. At the level of cemento-enamel junction extending from the line angle of adjacent teeth on either side of the recession deep into the papilla a horizontal incision was made, making a butt joint and at the distal terminal of the horizontal incision, vertical incision was given extending well into the alveolar mucosa.

For better blood supply the vertical incisions were outstretched deep into the vestibule and diverged apically to preserve a wide base to the flap. After flap reflection past the exposed root to the crest of bone then a partial thickness dissection was achieved to detach the periosteum from the flap. This periosteal detachment was outstretched apically until the flap was sufficiently mobile so that the flap margin could be coronally displaced and the exposed root can get covered without tension. A partial thickness flap was elevated and excised apically (Fig 2). The adjacent papillae were de-epithelialized to expose the connective tissue which permitted coronally positioned flap to attach and also provided blood supply to the connective tissue graft.

3.2. Preparation of donor tissue

The amount of donor tissue required was precisely calculated by using a foil template. The left side of palate between first and second premolar having greater thickness was selected to harvest the donor tissue avoiding the rugae area which has dense adipose tissues (Figure 2).

3.3. Obtaining the graft from donor site

The graft was planned to be retrieved from distal to anterior palatine rugae area with respect to tooth number 13, 14, 15. Greater palatine and nasopalatine nerve block were given using anaesthetic solution as used for the recipient site. Tin foil template of 16×7 mm was placed on the donor site and bleeding points were marked (Figure 2).

1. The initial incision was outlined by the placement of tinfoil template with a number 15 scalpel blade. Mesial and distal vertical incisions are placed as per the graft dimensions.
2. itudinal incision extending from the mesial to distal aspect along the palate is placed to connect the releasing incisions and elevate a partial-thickness trap door.[11]
3. Vertical incisions are extended 1 mm further over the intended apico-coronal graft dimension for improved access to the apical incision line that is used for harvesting a SCTG from below the trap door via a split-thickness sharp dissection as in the single incision technique.

The donor site was covered with haemostatic sponge for haemostasis and Hawley's retainer was placed to control the bleeding.

3.4. Graft preparation

Thorough inspection was carried out at the underside of graft for the presence of any fatty or glandular tissues. The tissue tags and fatty tissues were removed and graft of uniform thickness of about 1.5 mm thickness was prepared using 15 No. scalpel (Figure 3).

3.5. Graft placement

Then the graft was adapted on the recipient bed and secured first by use of two interrupted 4-0 silk sutures at the mesial and distal aspects (Figure 3). Then, graft was fully stabilized by use of criss-cross suture and re-inforced interrupted sutures. Pressure was applied with saline moistened gauze for 5 minutes to achieve haemostasis and formation of fibrin clot. The surgical site was then well-protected using tin foil and non-eugenol periodontal dressing (Figure 3).

3.6. Post-surgical instructions

The patient was instructed to refrain from tooth brushing at the surgical site for 10 days and Chlorhexidine mouthwash 0.2% 10ml twice daily for 10 days along with Amoxicillin 500 mg thrice daily + Metronidazole 400mg thrice daily for 5 days and Analgesics as per needed was prescribed and follow-up was appointed. On re-assessment of the recipient site and donor site in the consequent follow-up appointment, healing was found to be satisfactory. At the one-month follow-up, both recipient site and donor site were completely healed & desired results were obtained (Figure 4).

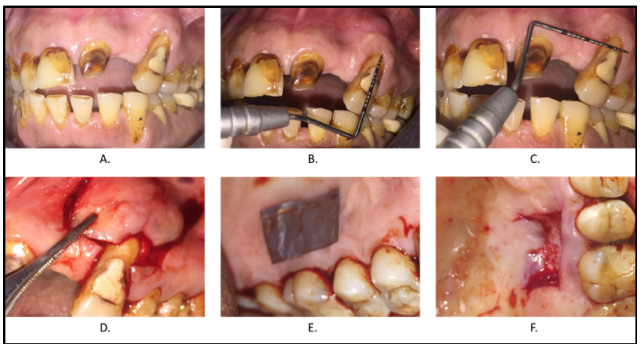

Fig. 2: A: Preoperative view of recession site; **B:** and **C:** Measuring the area with recession; **D:** Preparing the recipient site; **E:** Preparing the donor tissue site; **F:** Intraoperative view following graft SCTG harvesting using trap door method.

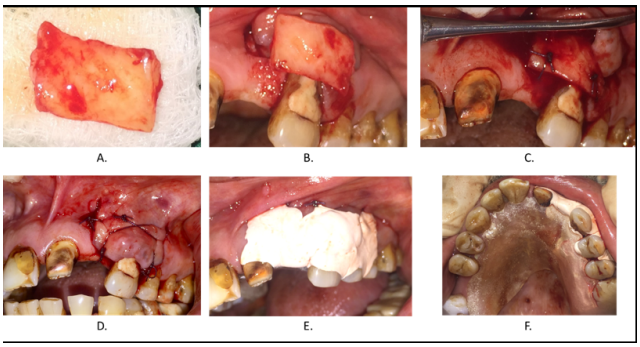

Fig. 3: A: SCTG graft retrieved from the donor site; **B:** Graft placed on the recipient site; **C:** SCTG graft stabilized using interrupted suture; **D:** Criss- cross suturing done after the graft is stabilised and the flap is coronally advanced; **E:** Non-Eugenol Periodontal Dressing given; **F:** Hawley's palatal retainer for better haemostasis.

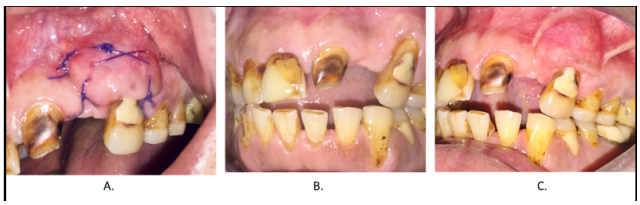

Fig. 4: A: Post-operative follow up healing; **B:** Pre-operative recession; **C:** 3-month follow-up with good outcome achieved.

4. Discussion

This case report presents with RT2 recession (Cairo et al. 2011) for the tooth region of #23 (FDI Numbering system)/#11 (Universal Numbering system), which was successful in complete root coverage by sub epithelial connective tissue graft (SCTG) and coronally advancing the flap (CAF). There are certain rules set by Miller[12] for successful root coverage such as the soft tissue margin must be at the cemento-enamel junction, clinical attachment to the root, with sulcus depth of 2mm, and bleeding on probing negative. In his study Miller treated 100 cases of marginal tissue recession with root planning, saturated citric acid burnished into the root of 5 minutes and with free gingival graft and observed that root coverage of 100% was attained in the area of deep-wide recession and 100% in shallow-wide recession and thereby setting the above-mentioned rules.

Subepithelial connective tissue graft (SCTG) procedures provide the best root coverage outcomes for Millers Class I and Class II recession and is set as the gold standard and Acellular dermal matrix graft (ADMG) or enamel matrix derivative (EMD) in conjunction with a coronally advanced flap (CAF) can serve as alternatives to autogenous donor tissue.[13] In our case the recession was Millers Class II or RT2 type (Figure 1).

There are several techniques available to obtain suitable SECT graft. Among the techniques used for SCTG harvesting, Langer and Langer trapdoor[11] method has sustained the test of time. Langer and Langer method along with most of the techniques requires free hand dissection of the palate and, ergo, is a highly technique sensitive procedure. In this case since it was canine tooth which has prominent canine eminence, root coverage is often questionable.

In this case SCTG was considered. The tooth had class V caries which were already treated using GIC. The graft was harvested using trap door method however, there was nick in the epithelial layer while retrieving the graft which later healed during the follow-up. Chemical root-surface biomodification has not been demonstrated to influence clinical results[13] and hence in this case we did not use any of them.

According to Sullivan and Atkins when graft is adapted over recession, some quantity of bridging can be predicted due to a part of grafted tissue which is covering the root will survive by receiving circulation from the vascular portion of the recipient site. Also, creeping attachment can cause post-operative coronal migration of free gingival margin.

The success rate of root coverage reported in the literature by Goldstein et al.[14] was 97% for intact roots and 92% for carious roots over a 34-month follow up. In his study, 18 of the 27 roots treated had 100% root coverage.

Short- and long-term results of root coverage with CTG on intact roots tend to improve with time as reported in the literature by Lee and colleagues.[15] In their study, root coverage improved from 85% at three months to 91% at six months and finally 92% at 12 months. Postoperative complications usually include swelling, pain, hematoma or post-operative bleeding.[16]

Good long-term result was seen with the subepithelial connective tissue graft and coronally advanced flap. Not only was the previously restored root completely covered but the zone of attached gingiva was increased. No scar

tissue is seen and the new gingiva blends in very well with the surrounding tissue. The 3 month and 1-year post-op follow-up displayed more root coverage than the one-month and six-month postoperative photos. This illustrates "creeping re attachment" which is seen for tooth #23 (FDI Numbering system)/#11 (Universal Numbering system).

5. Conclusion

Sub-epithelial connective tissue autograft (SCTG) is the "gold standard" technique as per the consensus report among all root coverage techniques found in literature. Our case demonstrated a good predictable outcome using SCTG along with CAF technique even on the canine which has prominent root surface. Clinicians must incorporate such techniques to achieve best outcomes for the benefit of the patients.

6. Conflict of Interest

The authors declare that there are no conflicts of interest in this paper.

7. Source of Funding

None.

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