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Treatment of Gingival Recession Using Tunnel Subepithelial Connective Tissue Graft Technique

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Abstract: *Gingival recession is the exposure of root surfaces due to migration of gingival margins apical to the cement-enamel junction. The etiology of gingival recession is considered multifactorial and its prevalence increases with age. Periodontal plastic surgery deals with regenerative procedures designed to restore form, function and enhance esthetics. There are various techniques for root coverage. The correction of class I and II gingival recessions are presented as a means of minimizing surgical trauma and achieving predictable aesthetic results. In this case report, I present a technique in treating gingival recession by using the Tunnel subepthelial connective tissue graft.*

Keywords: *Connective tissue Graft, Gingival Recession, Root coverage, Tunneling Procedure*

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I. Introduction

Gingival recession, defined as the displacement of marginal tissue apical to the cemento-enamel junction (CEJ) with the loss of periodontal connective tissue fibers along with root cementum and alveolar bone. The recession of gingiva, either localized or generalized, results in attachment loss and root exposure. They were treated by multiple surgical techniques, among which SCTG has become one of the most researched procedures used to achieve root coverage and increase the width of attached gingiva [1]. This case report puts emphasis on a case in which SCTG was used to augment recession coverage.

1.1 Pouch and Tunnel technique indications [2]

- Miller's Class I and Class II gingival recession [3],
- Lack of adequate donor tissue for a lateral sliding flap,
- Presence of multiple and wide recessions in maxillary teeth,
- Increased recession in areas where esthetics is of great concern,
- Exposed root sensitivity.

II. Case report

A male patient with the age of 32 years visited Department of Periodontics with the chief complaint of receding gums and sensitivity about 14 and 15 [Fig1].

2.1 Inclusion criteria

Maxillary teeth with Millers Class I and Class II gingival recession [3]
No loss of hard and soft tissue in the inter-dental area
Non-smoker
Good oral hygiene.
Tooth vitality and absence of irregularities
Patient not undergone any periodontal surgery in past one year

2.2 Exclusion criteria

Root surface restorations
Root caries
Smokers
Medically compromised patient

2.3 Treatment plan

The patient had an inadequate width of attached gingiva in the buccal aspect of 14, 15; the treatment of gingival recession decided by using a supra-periosteal tunneling procedure combined with SCTG harvested from the palate.

2.4 Pre-surgical therapy

By taking history and through the routine laboratory investigations, general assessment of the patient was done. The treatment protocol was explained to the patient, and the informed consent obtained. Phase 1 preparation was done to the patient, including scaling and root planing and oral hygiene instructions. The patient was instructed to adopt Modified Stillman's method for cleaning in areas with gingival recession. Patients recalled after four weeks for the surgical procedure.

2.5 Parameters assessed

Parameters were assessed with the Williams graduated periodontal probe. Following parameters were evaluated at baseline and two months after the surgical procedure.

Recession depth (RD) - It is the distance between CEJ to the most apical point of the gingival margin.

Probing depth (PD) - It is the distance between the gingival margin and the bottom of the gingival sulcus.

Clinical attachment level (CAL) - Measured from the CEJ to the bottom of the gingival sulcus.

2.6 Surgical technique

2.6.1 Recipient site preparation

After anesthetizing the area with the local infiltration using 2% lidocaine with a concentration of 1:80000 adrenaline, sulcular incisions were given through each recession area with a no.15 blade and care was taken to not extend the incisions till the tip of the interdental papilla. A partial-thickness mucoperiosteal flap was reflected, extending beyond the mucogingival junction reduce the tension on the flap and to facilitate the coronal displacement of the flap subsequent to placement of the graft. Each one pedicle adjoining the recession was undermined gently, without detaching it entirely to prepare a tunnel. The undermining of tissues to build up the tunnel was made by extending it laterally about 3-5 mm [Fig 2].

2.6.2 Donor site preparation

SCTG was harvested using Lui's Class II incision from the palate [4]. The incision was placed between the distal aspect of canine and mesial aspect of the first molar area. Tissue forceps s used to lift the prepared palatal flap edge, and the connective tissue graft was harvested [Fig 3&4]. The pressure was applied to the donor area with gauze soaked in saline, to control bleeding. The palatal flap was then sutured with 3-0 direct interrupted suture [Fig 5].

2.6.3 Graft placement

The suture was passed from the mesial aspect of the tunnel and pushed smoothly to the distal direction with a periosteal elevator so that the graft may slide beneath the tunnel and the graft was positioned coronal to CEJ [Fig 6]. After placing, the graft was secured to the mesial and distal aspect with sling sutures to prevent movement of the graft [Fig 7]. Periodontal dressing (Coe-pak) was used to cover the surgical sites [Fig 8&9].

2.7 Postoperative care

Amoxicillin 500 mg thrice daily and Diclofenac 50 mg twice daily were prescribed for five days. The patient was instructed to follow all the normal oral postoperative hygiene instructions. The patient was instructed to rinse the oral cavity with 0.12% Chlorhexidine Gluconate mouth rinse for two weeks. The patient was advised to avoid pulling his lip to observe the surgical site. The patient was recalled after 24 hours and 7days. The periodontal dressing was removed together with the sutures after seven days [Fig 10&11]. Recall appointment was scheduled after 60 days [Fig 12&13].

III. Results

TABLE 1 gives the comparison of clinical parameters assessed at the baseline and after 60 days. At baseline values of CAL were 5 mm and 3 mm with regard to 14 and 15, RD was 4 mm, and 2 mm with regard to 13 and 14 and PD were 1mm and 1mm with regard to 14 and 15 respectively. After 60 days of postoperative phase, the values of CAL were 1mm, 0mm with regard to 14 and 15, RD was 1mm and 0mm with regard to 14 and 15, PD was 0mm and 0mm respectively.

IV. Figures and Tables

Figure 1: Preoperative view of class I gingival recession in relation to right maxillary first premolar and second premolar.

Figure 2: Pouch and tunnel preparation done

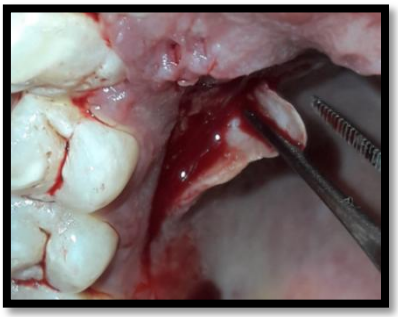

Figure 3&4: Sub-epithelial connective tissue graft was harvested.

Figure 5: Sutures placed at palatal aspect.

Figure 6: Graft positioned in the tunnel.

Figure 7: Sutures placed at the surgical site.

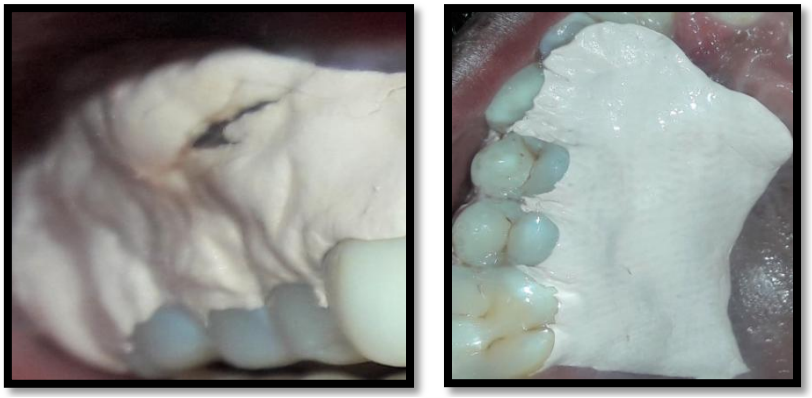

Figure 8&9: Periodontal dressing placed.

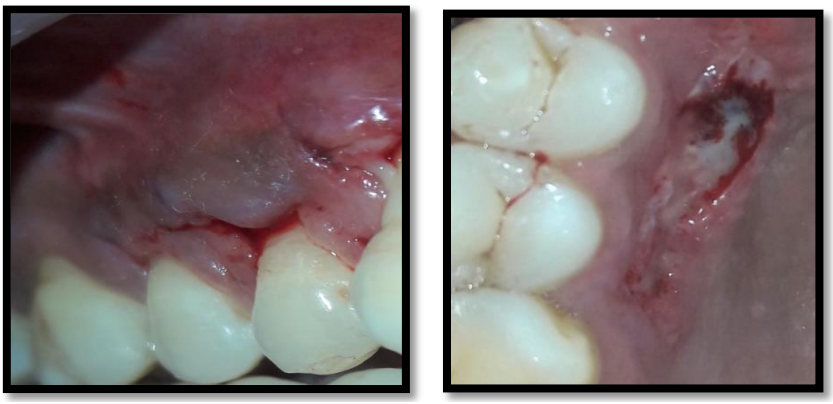

Figure 10&11: After 7days of suture removal

Figure 12&13: After 60 days follow-up

Table 1: Comparison of clinical parameters of right first premolar and right second premolar

Clinical Parameters	Tooth	Baseline	After 60 Days
CAL	Right First Premolar	5	1
	Right Second Premolar	3	0
RD	Right First Premolar	4	1
	Right Second Premolar	2	0
PD	Right First Premolar	1	0
	Right Second Premolar	1	0

V. Discussion

Gingival recession is a very common occurrence and requires treatment to prevent further complications. Recession can occur with or without loss of attached tissue. In old times, periodontal treatment procedures were principally aimed at preventing and treating the existing periodontal diseases. However, with increasing esthetic demands, these surgical procedures are modified to preserve and enhance esthetics by various periodontal plastic surgical procedures [2]. Several surgical procedures have been proposed in the last few years to obtain root coverage on the exposed root surface, including coronally positioned flaps, subepithelial connective tissue grafts, and free gingival grafts [5]. Among these, SCTG has become a more popular treatment modality for coverage of denuded roots because of its high degree of success. It has shown the best predictability (95%) of root coverage in Millers Class I and II cases [2]. The use of connective tissue grafts for the treatment of gingival recession began in 1985 when Langer and Langer described SCTG technique for covering the gingival recession of both single and multiple adjacent teeth [6]. This procedure is indicated because this technique had "the advantage of a closer color blend of the graft with adjacent tissue avoiding the "Keloid" healing present with free gingival grafts and SCTG had double blood supply at the recipient site from the underlying connective tissue base and the overlying recipient flap [2] and is responsible for the increased predictability of bilaminar procedures, which helps in revascularization of the graft tissue [1]. Another advantage of Subepithelial connective tissue graft is that the donor tissue obtained from the under-surface of the palatal flap, and it is sutured back in primary closure; therefore, healing is by first intention [1]. In patients with an adequate amount of keratinized tissue apical to the recession defect, the coronally repositioned flap technique may be recommended[5]. In 1985 Raetzke, who described a different version of connective tissue graft called as envelope technique. Allen (1994) in a modification of Raetzke's technique, described as "Tunnel or supra-periosteal envelope technique," for treatment of multiple adjacent gingival recessions [2].

In this case report, the recession sites were treated with tunnel and sub-epithelial connective tissue graft, and it showed 100% root coverage about right maxillary second premolar and 75% root coverage about right maxillary first premolar after 60 days of treatment. This tunnel technique was designed specifically for wide multiple recessions frequently found in the maxilla where root coverage seems to be most difficult to obtain. The results of this procedure demonstrated favorable root coverage. This tunnel technique not only preserves the papillary height between two muco-gingival defects but also helps to maintain the adequate blood supply to the underlying graft.

VI. Conclusion

Gingival recession is a severe concern both functionally and esthetically. The surgical technique of selection depends on several factors, and each having their advantages, disadvantages, indications, and contraindications. The clinician should prefer from among the different surgical protocols available, and select the slightest traumatic technique for the patient. The success of any root coverage procedure is determined by

different factors that are critical at each step of the procedure, starting from case selection to long-standing maintenance (supportive periodontal therapy) and patient compliance. SCTG with pouch and tunnel technique produce significantly superior and predictable outcome with greater advantages.

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