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# Management of localised gingival recession by pouch and tunnel technique with subepithelial connective tissue graft

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**Abstract**

**Introduction:** Gingival recession is characterized by the apical migration of the gingival margin, exposing the root surface. Cosmetic treatments have become an integral part of periodontal treatment. One of the commonly used aesthetic periodontal procedures is covering of denuded root surface. The indications to cover the root surface exposed by gingival recession include aesthetic, root sensitivity, prevention and management of root caries and prevention of periodontal disease progression in areas where oral hygiene cannot be maintained properly.

**Materials and Methods:** A 32 years female patient participated in the study with buccal gingival Miller's class III recession on 11 region. Ophthalmic surgical blades were used for surgical procedure along with 5-0 polypropylene suture.

**Conclusion:** It may be concluded that this new technique has shown that sub epithelial connective tissue graft in treatment of root coverage can give a very predictable result.

**Keywords:** Management, localised gingival, tunnel technique, tissue graft

## 1. Introduction

Cosmetic treatments have become an integral part of periodontal treatment. One of the commonly used aesthetic periodontal procedures is covering of denuded root surface. Gingival recession is apical shift of marginal gingiva from its normal position, on the crown to level on root surface beyond cemento-enamel junction [1].

Periodontal plastic surgery is defined as surgical procedure performed to correct or eliminate anatomy, developmental or traumatic deformities of gingiva or alveolar mucosa [2]. Studies by Murray and Gorman *et al*. have shown that recession increases with increasing age. A survey revealed that 88 % of people above 65 years of age and 50% of people between 18 and 64 years of age have one or more sites with recession ( Serino G, Wennstrom JL, Lindhe J) [3].

The indications to cover the root surface exposed by gingival recession include aesthetic, root sensitivity, prevention and management of root caries and prevention of periodontal disease progression in areas where oral hygiene cannot be maintained properly [4, 5].

### 1.1 Causes of Gingival Recession

1) Predisposing factors:
   - Minimal attached gingiva
   - Aberrant frenal pull
   - Tooth malposition (Fenestration and Dehiscence)
2) Precipitating factors:
   - Inflammation related to plaque
   - Improper tooth brushing
   - Iatrogenic factor such as crown preparation extending subgingivally, impression technique involving gingival retraction
   - Poor orthodontic treatment where the teeth are moved outside the labial or lingual plate.
3) Anatomical factors including abnormal tooth position in March, aberrant path of eruption, individual tooth shape.
4) Pathological factors such as bone resorption due to periodontal disease [6].

### 1.2 Tratment Planning

If recession is not progressing and does not provoke tooth sensitivity or poor aesthetics, then tooth brushing instructions and regular observation through a strict maintenance program would be optimal treatment. A thorough plaque control is the primary condition for the success of any periodontal surgery. The importance of phase I therapy in the successful treatment of all periodontal surgical procedures includes the one for root coverage. Phase I therapy for such cases includes both the home and in office care [7].

Smoking is contraindicated for plastic surgery due to:

- Associated gingival vasoconstriction that often causes necrosis of soft tissue.
- Lack of adherence of fibroblast [8] and
- Alteration in immune response [9]

Several surgical techniques have been used to achieve root coverage such as pedicle soft tissue graft [10-11] [flap positioned coronally, flap positioned laterally & double papilla flap]. Free gingival graft [12], subepithelial connective tissue graft (SCTG) [13], acellular dermal matrix allograft [14], guided tissue regeneration [15]. In the present case report Pouch and Tunnel technique is used which was outlined by Allen in 1994 [16] for the treatment of multiple as well as single tooth gingival recession.

### 1.3 Indication for pouch and tunnel technique

- Miller's class I and class II gingival recession.
- Lack of adequate donor tissue for lateral sliding flap.

- Presence of multiple and wide recession in maxillary teeth.
- Increased recession in areas where aesthetic is of great concern.
- Exposed root sensitivity.

### 1.4 Case Report

A 32-years female patient was referred to the Periodontology department, C.S.M.S.S. Dental College, Kanchanwadi, Aurangabad, Maharashtra, India, in May 2016 by her endodontist for evaluation and treatment of recession with maxillary right central incisor (Fig-1). Her complaint was aesthetics and discolouration of tooth.

Her endodontic treatment was done 6 months back. She was non-smoker, presented with good systemic health and brushed her teeth medium bristle tooth brush using horizontal scrub method. The clinical examination revealed plaque index (PI) of 43% and gingival index (GI) 18% with recession extending beyond mucogingival junction on buccal aspect of 11. The probing depth was ≤ 2mm on mesial, distal and lingual aspect.

The patient underwent complete scaling and root planing, teeth polishing and oral hygiene instruction and use of soft bristle tooth brush was recommended. After 1 month, the PI was 19% and GI was 9 %. This tooth presented a Miller's class III recession on buccal side. The recession was measured 7 mm and probing was 1mm causing 8 mm clinical attachment loss. The patient was explained about the procedure and written consent was obtained.

### 1.5 Receptor Site Preparation

Initially, intraoral and extraoral antisepsis was carried out using 0.12% chlorhexidine digluconate following local anaesthesia, the exposed root surface was submitted to scaling and root planing. After that sulcular incisions were made through buccal aspect with the Lance blade (1.2mm) from 21 to 12 (Fig. -1). The partial dissection was carefully performed in order to create a deep pouch beyond mucogingival junction while keeping tip of interdental papilla attached to the teeth below proximal contact point (Fig-2, 3). The pouch on 11, 12 and 11,21 was prepared using slit blade 2.8 mm and tunnel was prepared using Tunnel blade 2.1mm.

**Fig 1:** Baseline

**Fig 2:** Tunnel prepared on distal side

**Fig 3:** Tunnel prepared on mesial side

### 1.6 Donor Site Preparations

SCTG was harvested from palatal mucosa that would be large enough to completely cover the tunnel area (Fig.4). The selected area extended from the distal aspect of cuspid to the distal aspect of left first premolar (Fig.5). Single incision technique was used to remove the graft. The primary flap was immediately suture to prevent bleeding. Acrylic stent was given so that patient will be comfortable while eating and drinking.

The CTG was delicately inserted inside pouch and then stabilised using 5-0 polypropylene sutures (Fig.6). A periodontal pack was given and patient was advice not to brush for 72 hours in the area of surgery (Fig.7). An ice pack was given immediately post operatively and asked to restrain from the spitting or rinsing for first few hours. Patient was instructed to take analgesic medication (Paracetamol 750 mg, three times a day for 4 days) and mouth rinse with 0.12% chlorhexidine digluconate (Twice a day for 15 days). The patients was recalled after 24 hours, three days and then after 1 week. The pack and suture were removed after 7 days. The patient was followed up weekly during first month and monthly up to third month.

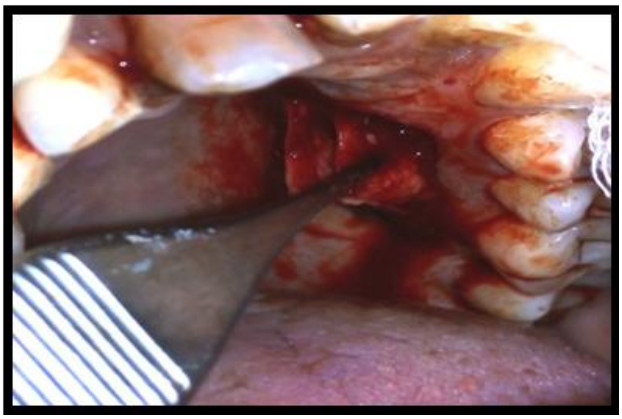

**Fig 4:** Graft harvested from palatal side

**Fig 5:** Subepithelial connective tissue graft

**Fig 6:** Graft sutured on recipient site

**Fig 7:** Coe pack placed

### 1.7 Clinical Evaluation

The healing process was uneventful and the patient did not report pain or discomfort during the overall post-operative period. During the surgical procedure bleeding was within the normal limits. During the post-operative follow up, no signs of necrosis or haemorrhage were observed in the donor area and no pain or discomfort was reported. The colour of tissue was nearly homogenous 2 weeks following surgical procedure, with some reddish regions in the sites where the connective tissue was left exposed and there were no signs of incision or suture marking (Fig-8). Because releasing incisions were not made in the receptor area, healing was achieved at very early stage and without presence of scars. Aesthetic improvement was observed 3 months post operatively (Fig-9).

**Fig 8:** 1 week post-operative

**Fig 9:** 1 month post-operative

**Fig 10:** Final Prosthesis

**Fig 11:** Armamentarium used during surgery

## 2. Discussion

There are four basic techniques for root coverage:

1. Pedicle graft 2. Free gingival graft 3. Connective tissue graft 4.Membrane barrier guided tissue regeneration. All of these techniques were used today, and use of each of them is based on its advantage or disadvantage, as well as on the individual surgeon's preference and experience. The free connective tissue graft is a bilaminar procedure designed to maximize the supraperiosteal and gingival blood supply to the graft. The use of free connective tissue for root coverage was introduced by Edel in 1974, but didn't receive wide approval by profession [17]. Later technique was presented by Langer and Calagna as the 'subepithelial connective tissue graft' and described in detailed by Langer and Langer [19].

In the present technique instead of performing a releasing incision a tunnel is prepared. This window facilitates the insertion of sliding of the graft and allows the preservation of papillary integrity, which minimizes the surgical trauma and the need for additional sutures. As a result post-operative period is less painful, the healing process is faster, an aesthetic result is obtained earlier, and scars are avoided. Conversely disadvantages are the difficulty in preparing the receptor site with maximum care taken not to perforate the flap or disrupt the papilla, as well as the delicate placement of graft.

The manoeuvre to increase the graft extension is performed easily, and the final thickness obtained should be around 1.5 mm, considered adequate in root coverage procedures [20]. The tissue that covers the root surface seems to attached tightly throughout the follow up period. There were no signs of inflammation in the operated sites. It is still unclear what type of attachment occurs after the root coverage procedure. Histological study of similar kind of procedure in the past showed that the healing may be due to repair but not by regeneration [21].

In present case report, the mean percentage of recession coverage was 90% where values range from 74% to 91.6% in the literature [20]. The increased in keratinised tissue is related to the magnitude of root coverage because flap was not displaced coronally during surgical procedure. Thus, portion of graft that was left exposed seem to have been submitted to a keratinised process, resulting in root coverage as well as increase in keratinised tissue strip. Therefore the mean gain of keratinised tissue was around 6 mm.

On contrary to the present case, a report by Sotirios Vastardis and Reymond A. Yukna (2003) stated that there was formation of gingival/ soft tissue abscess following subepithelial connective tissue graft for root coverage. In their cases polylactic acid / polyglycolic acid (PGA) based bioabsorbable sutures were used to secure the connective tissue graft to the recipient bed. Possibility of stitch abscess should be considered, since this is a quite a common problem reported after the surgical procedure [22]. Therefore, it could be recommended that if sutures are to be used in submerge environment, perhaps a non-braided sutures (such as cat-gut) should be selected.

Randell J. Harris (2002) noted a cyst like area after a connective tissue graft. This is because epithelium still remained in 80% of connective tissue graft, which could be source of developing small cyst like space. But additional studies are required. Another explanation is also possible. The cyst like space occurred in the area where the junction of connective tissue graft and recipient bed was located. At one point there may have been an invagination, which may result in cyst like space. Once again further study needed.

## 3. Conclusion

This new technique has shown that surgical technique using sub epithelial connective tissue graft in treatment of root coverage can give a very predictable result. The advantages of this technique are excellent colour matching, dual blood supply to the graft. Clinical studies using larger sample size and longer duration are advised to determine the success and predictability of this technique.

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