TWO-STEP SURGICAL PROCEDURE FOR ROOT COVERAGE (FREE GINGIVAL GRAFT AND CORONALLY POSITIONED FLAP) - A CASE REPORT

Dr Prashant Bhusari*, Dr Apoorva Saxena**, Dr Jaya Jain***, Dr Rashmi Rathore***, Dr Aditi Chaudhary

ABSTRACT: Cosmetic treatments have become an integral part of periodontal treatment. One of the commonly used esthetic periodontal procedure is coverage of denuded root surface. Gingival recession require treatment for many reasons- impaired esthetic appearance, root sensitivity, cervical caries or abrasion. This literature has documented that deep recession can be successfully treated by means of two surgical approach- the first stage consisting of creation of attached gingiva by using free gingival graft and in the second stage a coronally positioned flap of grafted tissue to cover the recession. The case report involved a 30 year old woman with the gingival recession of 8mm on 41 (miller’s class II recession). Before surgery full mouth scaling and polishing were performed. Recession height, probing depth, clinical attachment level and width of attached gingiva were measured at baseline, two months and six months postoperatively. Two months postoperatively there was a 5mm gain in width of attached gingiva and 13% root coverage. Six months postoperatively there was a significant increase in width of attached gingiva, clinical attachment level and reduction in height of recession (root coverage achieved was 88%). These results suggested that this two stage surgical procedure could be successful for root coverage in case of deep recession and lack of attached gingiva in the mandibular region.

Key Words: gingival recession, hypersensitivity, root coverage, aesthetics, free gingival graft, coronally advanced flap.

INTRODUCTION:
In the current practice of periodontics, clinicians are faced with the challenge of not only addressing biological and functional problems present in periodontium but also providing therapy that results in acceptable esthetics. Presence of gingival recession and gingival inflammation in areas with absence of or narrow band of attached gingiva is defined as a mucogingival problem¹. Increased root sensitivity, cervical abrasion and cervical caries are usually the clinical sequelae of gingival recession.²

During the past decade a variety of regenerative procedures with the potential to correct gingival recession defects via augmentation of the width of keratinized gingiva as well as to obtain root coverage have been proposed. Procedures are being constantly modified or used in combination to achieve successful and predictable root coverage. The aim of this case report is to demonstrate that a two-step surgical procedure using a free gingival graft (FGG) and a coronally advanced flap (CAF) performed after two months of first surgical procedure is suitable and successful in areas that have a lack of attached gingiva and deep recession.

CASE REPORT
A 30 year old female patient reported to the Department of Periodontics, Modern Dental
College & Research Center Indore (MP) with the chief complaint of longer lower front tooth that was sensitive to cold. The patient was systemically healthy and exhibited fair oral hygiene. On examination, gingival status revealed red colored marginal and papillary gingiva in relation to 31 with bleeding on probing. Miller’s class II gingival recession[^1] was seen in relation to 31 and attached gingiva was zero (inadequate) mm with thin and narrow keratinized gingiva adjacent to the defect (Photo-1). The involved tooth was in traumatic occlusion with grade I tooth mobility[^4] (fremitus test +ve). There was 10 mm of attachment loss with 2 mm probing depth. The tooth (31) was vital on pulp testing. Radiographic examination showed normal height of interdental bone on the proximal aspects of affected tooth. In this patient the reason for gingival recession was trauma from occlusion (TFO) and marginal inflammation. Routine hemogram revealed all the parameters in their normal range.

**TREATMENT PROTOCOL**

**PHASE I THERAPY :-**

Phase I therapy was initiated four weeks prior to the first root coverage procedure. It consisted of scaling and polishing of all the teeth and root planing in relation to 31, coronoplasty with 31 to eliminate TFO and tooth mobility. Oral hygiene instructions were given with correction of faulty tooth brushing habit and 0.2% chlorhexidine mouthwash was advised. The procedure was explained to the patient and a written consent obtained.

**SURGICAL PHASE I :-**

**Gingival augmentation with free gingival graft-**

Surgical procedure was performed four weeks following phase I therapy. After disinfecting with 0.2% chlorhexidine mouth rinse, local anaesthesia was administered to the recipient site (31 region) and donor site (palate premolar molar area). The first part of surgery involved preparation of the recipient site apical to recession area. A horizontal incision along the mucogingival junction extending one tooth mesially and distally from affected area was placed using a no.15 bard parker blade. Using sharp dissection, connective tissue and muscle fibers were carefully dissected away from the periosteum (Photo-2). The dissected gingival tissue of the vestibular mucosa was fixed to the periosteum using resorbable sutures. A tinfoil template of the recipient site was prepared and placed over the donor site to facilitate the placement of incisions. Free soft tissue graft, one and half times the dimensions of recession (12mm × 10mm) was harvested from palate. The FGG was adapted over the root and adjacent raw recipient bed and stabilized using 3-0 silk suture (interrupted and horizontal cross mattress sutures) (Photo-3).
The recipient site was protected using a tinfoil and periodontal dressing and the donor site was protected with an acrylic stent, which the patient wore for two weeks. Following surgery the patient was kept on soft diet. She was instructed to avoid contact or trauma to the grafted site as well pulling the lip in any direction. Patient was placed on 0.2% chlorhexidine mouthwash for four weeks. Tab ibuprofen 400 mg three times a day were prescribed for three days for pain control. Sutures were removed ten days postoperatively. The patient was reviewed regularly for a period of six months. Significant increase in the width of attached gingiva was appreciated in about four weeks and around 1mm reduction in the recession height was observed (Photo-4).

**SURGICAL PHASE II** :-
Root coverage with coronally advanced flap-
After healing period (2 month) the second step of surgical procedure was performed. The grafted tissue was positioned in coronal direction. The flap design was made by an intrasulcular incision and two oblique releasing incisions from mesial and distal ends of the horizontal incision beyond the mucogingival junction. The full thickness flap was reflected to expose bone dehiscence on the root at least 3mm without involving adjacent papillae. The partial thickness portion of the flap was extended apically so that it could be repositioned at the cementoenamel junction (CEJ) without tension. The interdental papillae adjacent to the recession are de-epithelialized to act as recipient bed for CAF. The flap was repositioned slightly above CEJ and sutured with the help of orthodontic tube fixed to the affected tooth by 3-0 non-resorbable silk suture (Photo-5). The purpose of using this method was to maintain the coronal position of CAF till the healing period. Again the surgical site was protected by tinfoil and periodontal dressing. Sutures were removed after ten days. Plaque control was performed weekly professionally and in addition chlorhexidine rinse 0.2% was advised two weeks post surgery. Tooth brushing was avoided at surgical sites for the first four weeks.

**RESULTS**
Clinical parameters at baseline, at 2 months and at 6 months.

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<thead>
<tr>
<th>Parameters</th>
<th>Baseline</th>
<th>2 Months</th>
<th>6 Months</th>
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<tr>
<td>Recession height</td>
<td>8mm</td>
<td>7mm</td>
<td>1mm</td>
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<tr>
<td>Probing depth</td>
<td>2mm</td>
<td>2mm</td>
<td>2mm</td>
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<tr>
<td>Width of keratinized gingiva</td>
<td>1mm</td>
<td>8mm</td>
<td>8mm</td>
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<tr>
<td>Width of attached</td>
<td>0mm</td>
<td>6mm</td>
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Percentage of root coverage was 13% at two months (Photo-6)

Percentage of root coverage was 88% at six months (Photo-7)

**DISCUSSION**

Root coverage in the mandibular incisor region is a challenge in periodontal plastic surgery for several reasons. There is often a high frenal attachment, shallow vestibule and thin or non-existent quantities of keratinized gingiva. This poses problems during root coverage procedure due to compromised blood supply as well as excess flap tension which hinder graft stabilization. Various techniques either singly or in combination have been proposed for the management of marginal tissue recession. These techniques offer different rates of success and predictability. The reported success rate of rotational flap is 41-74%, CAF is 70-99%, GTR is 54-68%, CTG is 52-98% and that of FGG is 11-87%.

In 1956 Gnu and Warren made initial attempt to cover the denuded root using lateral pedicle flap. The main limitations of this technique is the presence of wide gingival recession with inadequate donor tissue on either side. The CAF is an old procedure in periodontics but is a predictable means of root coverage under certain defined conditions only which includes: shallow recession of ≤ 4mm, Miller’s class I recession, keratinized gingival tissue of ≥ 3mm apical to recession and gingival thickness of ≥ 1mm.

Bjorn in 1963, and Sulivan and Atkins in 1968 were the first to describe FGG. This autogenous graft was initially used to increase the amount of attached gingiva and extend the vestibular fornix. Later it was used to attempt coverage of exposed root surfaces. The surgical procedure is simple, but survival of the graft depends on the re-establishment of blood supply into new position. In early phase it is important to assure collateral circulation from the connective tissue bed bordering the defect, and therefore complete root coverage is not achieved and this is often a limitation of this procedure.

Due to unsatisfactory results with sliding flap and FGG, a two stage surgical procedure was advocated by various workers. Bernimoulin and his co-workers in 1975 described two-stage technique for gingival recession coverage where they initially placed a FGG apical to recession to increase the width of attached gingiva and two months later a full thickness graft.

<table>
<thead>
<tr>
<th>gingiva</th>
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<td>Clinical attachment level</td>
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PHOTO-6 POST-OPERATIVE VIEW AT 2 MONTHS

PHOTO-7 POST-OPERATIVE VIEW AT 6 MONTHS
mucoperiosteal flap was raised and advanced coronally to the desired position to get the gingival recession coverage. They reported clinically significant increase in the width of keratinized gingiva along with gingival recession coverage. In the present case, the tooth (31) presenting with deep gingival recession was also lacking in the attached gingiva. Thus a combination of the two highly predictable techniques (FGG & CAF) was adopted.

At the end of six months, 88% root coverage was achieved with the reduction in recession height from 8 mm to 1 mm. There was a minimal probing depth of 2mm at the treated site with no evidence of hidden recession. This might be partly attributed to the special suturing technique performed by using orthodontic tube fixed to the affected tooth. This suturing technique helped the CAF to be remained coronally till the healing takes place, thus the result achieved at zero hours remained stable for the entire length of observation (6 months).

The two-stage technique utilized in this case report is preferred over CTG as the utilization of FGG in two stage technique ensures the development of the adequate band of keratinized gingiva. The subepithelial connective tissue graft, on the other hand may result in root coverage but result in little if any increase in the apico-coronal dimension of the keratinized tissue\(^{10,11}\). Using a guided tissue regeneration membrane would have placed the flap under tension and the risk of membrane exposure predisposing the site to recession once again\(^{16}\). The success of an acellular dermal matrix (ADM) was unpredictable and also this allograft was expensive\(^5\). As a result it was not used in this case. The only limitation of the present two-stage surgical procedure is the cosmetic result of the FGG which may not be acceptable because in the FGG the donor tissue is usually harvested from the palate which has a paler appearance than surrounding gingiva.

Within the limitation of the presented case, the results suggests that this two-stage surgical procedure is highly predictable for root coverage in the case of deep recession and lack of attached gingiva in the mandibular anterior region. The procedure holds promise for the successful management of complex marginal tissue recession although further studies are warranted.

REFERENCES


CONCLUSION