# Root Coverage Procedures: A Case Series

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## Abstract

Gingival recession can be defined as the progressive loss of gingival soft tissues. Most of the recession cases can lead to root exposure, interdental bone loss, mobility of teeth. The defect can involve one or multiple teeth. Eventually it progresses towards the root hypersensitivity and tooth loss due to mobility. Recession can be treated via using different treatment modalities, by using gingival grafting and regeneration. Grafting procedure entails to harvesting the tissue from donor sites and suturing it back to the area of recession for root coverage. For regeneration purposes, various biomaterials are used with improved properties. Techniques involved in gingival grafts and regeneration involves free gingival grafts, coronally advanced flaps, guided tissue regeneration, etc. This case series reports the effectiveness of various techniques for vestibular deepening along with root coverage, removing the frenum pool along with increasing the width of the attached gingiva, etc.

***Keywords:*** *Gingival recession, Bridge flap, subepithelial connective tissue graft, Coronally Advanced Flap, Attached gingiva, Mucogingival surgery*

## Introduction

The chief purpose of periodontal care is to prolong the aesthetics and function of normal healthy gingival tissues. The treatment techniques for maintaining healthy gingival tissues also involves the treatment of gingival recession and its complication. Gingival recession can be defined as the displacement of gingival soft tissues apical to the CEJ. This will finally lead to alveolar bone loss and dehiscence. GR is mostly seen in older people but can also be seen in young patients because of several reasons like frenum pull and insufficient width of AG.[1]

The exposure of roots due to soft tissues and bone loss can progressively lead to several problems such as hypersensitivity, discomfort in the soft tissues, root caries, various aesthetic problems and problems regarding oral hygiene maintenance and adequate plaque control etc.

The current evidences showed various techniques with improved predictable success rate for treating Miller Class I and II single-tooth defects. Difficulties arise when there are case scenarios with Miller Class III and IV defects involving one or multiple teeth. Evidences gathered from various RCTs and systematic reviews showed the high success rate of subepithelial connective tissue graft (SCTG) for treating maxillary recession defects present labially or buccally.[3] Nevertheless, there are insufficient evidences and data available for the treatment of palatal and lingual recession sites. Therefore, this case series presents different techniques to treat the mucogingival problems.

**Case Reports:**

**Case 1:** A female patient of forty-two years of age visited inthe Institute Of Dental Sciences, Sum Hospital

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with a chief complaint of lowering of gums in the lower front tooth region. Clinical features revealed shallow vestibule and insufficient width of attached gingiva.

The recession was Grade I, according to Miller's classification[5],in 31, 41, 42 teeth (Figure 1a). The recession was similar (4 mm) in all lower anterior and the width of the attached gingival was approximately 2 mm (Figure 1b). IOPAR shows inadequate bone support present I .r.t to 31, 41, 42. UNC-15 probe is used for the measurement of clinical parameters which includes Probing Pocket Depth, Gingival Recession, width of attached gingiva,and Clinical Attachment Level. The patient was clarified about the surgical procedure and an informed consent was signed beforehand. The patient is not medically compromised. Phase 1 therapy was done 2 weeks before the procedure.

**Surgical Technique:** After injecting local anesthesia (with epinephrine), an incision was given in the vestibule from 31 to 42 (Figure 1c) which also includes the periosteum. The incision was made till the bone which will induced scar formation. After the sulcular incision, a full-thickness flap was elevated which connects the whole flap with the first incision so that the whole bridgeflap can be raised and coronally advanced to cover the recession from 31, 32 and 42 (Figure 1d). There was no need for a vertical incision. This forms a bridge from the coronal aspect to the vestibule (Figure 1e). Afterward, tetracycline HCl as a root conditioning agent is applied[4] which is further proceeded by the placement of platelet-rich fibrin membrane (Figure 1f). Then, the flapwas coronally advanced by the interrupted sling suture (Figure 1g). Resorbable sutures were used in this case. After the suture, the periodontal pack is (Figure 1h). After giving all the postoperative instructions in both verbal and written format and also required medications for improved postoperative healing and to avoid complications, the patient was discharged from the clinic. The patient was recalled after 14 days for suture removal and also to check for the healing of the surgical site. No such postoperative complications were seen with satisfactory healing was satisfactory with a significant gain in attached gingiva and clinical attachment was 5 mm (Figure 1i). Postoperative recession at a 1-month follow-up was about 1 mm. The patient was further instructed to use a softbristle toothbrush in the treated area. The patient was also instructed to maintain good oral hygiene in the surgical sites. Even after 9 months follow up, there was no such recurrence of recession.


**Figure 1a. Pre-operative view showing Millers Class I gingival recession (labial aspect) in the mandibular anterior region. Figure 1b. Pre-operative view showing gingival recession (clinical attachment level); Figure 1c. Sulcular incision given; Figure 1d. Incision given in the mucogingival junction.**


**Figure 1e. Full-thickness flap (Bridge Flap); Figure 1f. Platelet-rich fibrin placed; Figure 1g. Coronal repositioned flap and sutured; Figure 1h. Coe pack placed; Figure 1i. 3 weeks Post-operative.**

**Case 2:** A 31-year male, having a chief complaint of dentinal hypersensitivity in relation to 23 and 24, reported to the Department Of Periodontics And Oral Implantology, Institute Of Dental Sciences, Sum Hospital, Bhubaneswar.On examination, there was Miller's Class I gingival

recession[5] was present in relation to 23 and 24 (Figure 2a). Intraoral periapical radiograph in relation to 23 and 24 showed a sufficient presence of interdental bone. Clinical parameters included ProbingPocket Depth, Gingival Recession, width of attached gingiva,and Clinical Attachment Level. The briefing of the surgical procedure was done to the patient and an informed consent was signed beforehand. The patient is not medically compromised.Phase 1 therapy was done 2 weeks before the procedure.

**Surgical Technique:** After administering local anesthesia inthe recipient site, an intrasulcular incision was given from the distal aspect of 22 to the mesial aspect of 24 aspect. After that, full-thickness (mucoperiosteal flap) (Figure 2b) was raised. The surgical site was thoroughly debrided and the presence of any subgingival calculus was meticulously cleaned. After the preparation of the recipientsite, the size of the required graft was measured by a pre-sized tin foil template. The graft was harvested from the left palatal area, from mesial to the first premolar till mesial to the first molar. By utilizing the trap door technique[6], sub-epithelial connective tissue graft wastaken out of approximately the size of the tin foil template from the donor site. Afterward, the harvested tissue is kept in a moist gauge piece. (Figure 2c). The graft is shaped according to the size and need and abundant connectivetissue and fat were scared off by usingCastroviejo scissor. Subsequently, the graft was secured properly in on the recipient site, and secured with the help of sutures. (Figure 2d, 2e). After the graft placement, the flap was coronally advanced with the help of continuous sling sutures. (Figure 2f). After suturing, the patient was recommended to use a retention plate which the patient was previously using.

After giving all the postoperative instructions in both verbal and written format and also required medications and povidone-iodine mouthwash for improved postoperative healing and to avoid complications, the patient was discharged from the clinic. The patient was recalled on the tenth day to investigate for the acceptance of graft acceptance. Sutures are removed from both the donor and recipient sites. The patient was again made aware of the oral hygiene instructions (Figure 2g). In the follow-up sessionsthroughout 3 months patient wasrecalled, in which were seen a good root coverage

andsignificant aesthetic improvement was seen. Clinical examination revealed complete acceptance of the graft resulting from coverage of the root surface with the graft tissue. (Figure 2h). Complete healing of the donor site was also noted.

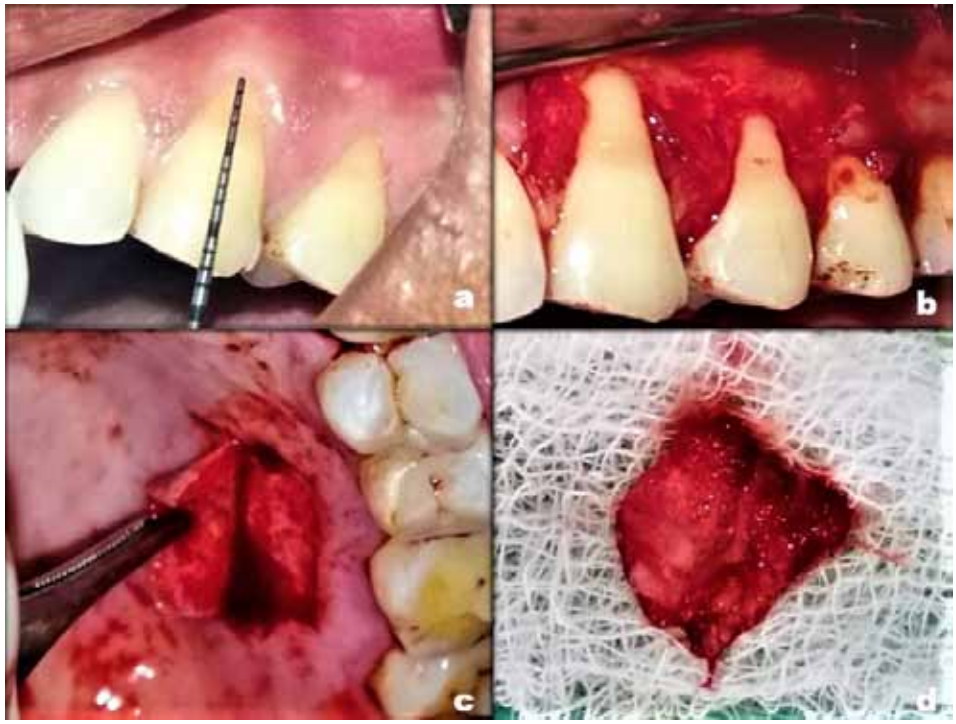


**Figure 2a. Millers Class I gingival recession in the buccal aspect of 23, 24; Figure 2b. Reflection of the Full thickness flap; Figure 2c. Harvesting of connective tissue by trap door technique; Figure 2d. After harvesting of the connective tissue**


**Figure 2d. Placement of the connective tissue graft; Figure 2f. Coronally advanced the flap followed by suturing;Figure 2g. Periodontal dressing Figure 2h. 3 months post-operative**

**Case 3:** A 31 year male, with the chief complaint of hypersensitivity in relation to 14, reported to the Department of Periodontics And Oral Implantology, Institute Of Dental Sciences, Sum Hospital, Bhubaneswar. Nothing significant reported in past dental history and medical history. Periodontal pockets were absent and there was no bone loss present in relation to 14 on intraoral examination (Figure 3a). There was Miller's Class I recession i.r.t 14 (Figure 3b) and no trauma from occlusion was present. The patient was recalled 4 weeks later after the scaling and root planing was performed. After the patient's consent it was decided to treat the case surgically by coronally advanced flap[7].

**Surgical Technique:** Local anesthesia 1:80,0000 was administered after the proper isolation of the surgical site. A 15 no. scalpel blade is used to make a sub papillary incision along the soft tissue margin of the surgical site (Figure 3c). After the incision, full-thickness flap was raised followed by undermining in order to advance the flap coronally (Figure 3d; 3e). Sling suture was placed once the flap was advanced coronally (Figure 3f).To prevent infective complications, antibiotics were prescribed to patients. Amoxycillin 500 mg thrice a day for 5 days and Analgesics (Ibuprofen) was prescribed thrice a day for 3 days and Chlorhexidinemouthwash was also prescribed twice daily for four weeks and advised to avoid vigorous brushing on the surgical site. The patient was recalled for follow-up after 2 weeks (Figure 3g). The sutures were removed and the site was irrigated with normal saline and Betadine. Healing was satisfactory. Recall was scheduled for 2 months. The recession coverage result showed morphologic and chromatic resemblance to adjacent gingiva. Thus patient satisfaction was perceived (Figure 3h).

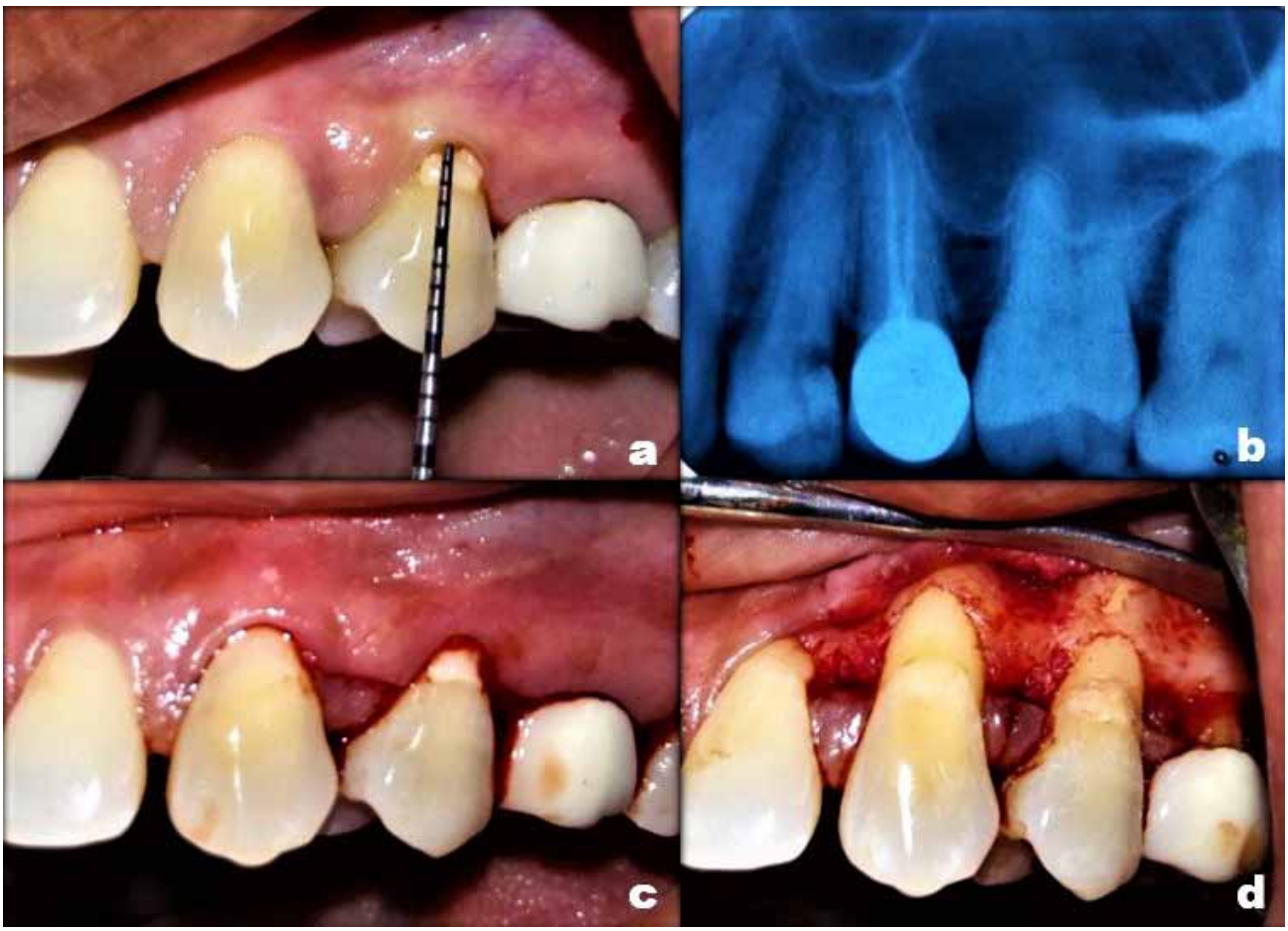


**Figure 3a. Millers Class I gingival recession in the buccal aspect of 14; Figure 3b. Intraoral Periapical Radiograph i.r.t 14; Figure 3c. The incision is given; Figure 3d. Full-thickness flap reflection followed by undermining**


**Figure 3e: Flap coronally advanced; Figure 3f: Sling sutures placed; Figure 3g: 2 weeks post-operative; Figure 3h: 2 months post-operative**

## Discussion

The favourable results of root coverage procedures depend on several factors, such as elimination and/ orcontrol of the etiology of gingival recession, evaluations of the interproximal bone level and decision making for the particular surgical based on the surgical site. Since the period of 1960s and 70s many surgical techniques to resolve mucogingival problems have come into limelight. Coronally advanced flap, laterally displaced flap, coronally positioned flap with free gingivalgraft are widely used as a chief treatment modalities of mucogingival problems. In the year 1985, Langer and Langerdescribed came up with a technique of harvesting the subepithelial conjunctive tissue graft for. This was considered ideal for treating single or multiple tooth recession. This SCTG is still considered as the gold standard in mucogingival surgical procedures because of its enhanced blood supply from the underlyingperiosteum and overlying flap.[8] The prime factor of the success of grafting depends on the proper placement of the flap and to maintain the position of the papilla. The bridge flap technique includes twosurgical techniques simultaneously. In this technique, the survival and the success of graft depends on the blood circulation from the adjacent tooth surface areas. The flap creates a practicalsurgical procedure with good aesthetic outcome with less or no recurrence.[1]

It is usually performed when a single surgical technique is required to cover the denuded root surfaces with insufficient width of attached gingiva. So basically this procedure both improves the width of the attached gingiva and also covers the root surface in a single step. Nevertheless, for the success of any surgical procedure, proper knowledge of the anatomy of CEJ and the bone should be mandatory. This knowledge will help out the clinicians for proper placement of flaps and giving incision. Lastly, the clinician should always check for the presence of the width of the attached gingiva which should be 2-3 mm for maintain good sulcus depth to perform daily oral hygiene habits. Subepithelial connective tissue graft technique was chosen for the root coverage procedure depending on several anatomic and socioeconomic factors of patients. Along with the improved blood supply, good colour matching is another perk of subepithelial connective tissue graft.[6]

However, all periodontal plastic surgery aims for the root coverage, but a proper and specific treatment strategy is required to determine the success rate of the mucogingival surgery e.g., patient-related factors (maintenance oforal hygiene, method of brushing and smoking, site-related factors like interdental periodontal support and extent of recession.

Allen and Miller in 1989 proposed another surgical technique named coronally advanced flap.[9] The coronally advanced flaps don't involve a donor site, considering this it has less morbidity than CTG and SCTG. It is the treatment of choice in cases where sufficient width of the attached gingiva is present. By using this technique, the colour, texture and thickness of the tissue can be maintained in the treated site (mostly in the buccal aspect).

## Conclusion

The success rate of multiple recession defects is based on predictable periodontal plastic surgery (PPS) procedures.[10] Etiology of the multiple defects,proper diagnosis, and case selection in a careful manner increase the surgical success. Bridge flap technique along with vestibular deepening, Subepithelial connective tissue and Coronallyadvanced flap technique may be used for successful management of single tooth recession or multiple teeth recessions.[11]

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