Management of Single Gingival Recession Using Coronally Advanced Flap with a connective tissue graft- a case report.

Manuscript Info

Manuscript History
Received: xxxxxxxxxxxxxxx
Final Accepted: xxxxxxxxxxx
Published: xxxxxxxxxxxxxxx

Key words:- Connective tissue graft, Coronally advanced flap, Esthetic, Gingival recession, Periodontal plastic surgery, Root coverage, Root hypersensitivity.

Abstract

Gingival recession is defined as the apical migration of the gingival margin beyond the cemento-enamel junction, exposing the root surface. It is a common clinical condition that may be associated with esthetic concerns, root sensitivity and increased risk of root caries. There are various types of treatments for gingival recession, both non-surgical and surgical. In this article, we describe two cases of single gingival recession defect that were successfully treated using a coronally advanced flap (CAF) combined with a subepithelial connective tissue graft (CTG). This approach was selected for both the patients to achieve root coverage, enhance tissue thickness and provide long-term stability. At the six months follow up, maximum root coverage, satisfactory aesthetics and significant clinical attachment gain were observed.

Introduction:-

Gingival recession (GR) is defined as the apical migration of the gingival margin surpassing the cemento-enamel junction (CEJ). This may cause the exposure of the root surface to the oral environment. [1] The high incidence of this defect, approximately 54% and 100% in young adults and middle-aged adults, respectively, can be attributed to a complex pathophysiology divided into direct causes and predisposing factors. [2] This condition can be brought on by occlusal trauma, persistent inflammatory periodontal disease, forceful tooth brushing and periodontal therapy. Additionally, certain factors that contribute to its development include muscle traction, frenulum insertion, bone dehiscence, soft tissue thickness, tooth architecture and position, decreased alveolar bone crest thickness and orthodontic treatment. [3] Dentin hypersensitivity may develop as a result of gingival recession. Because they are exposed to the oral environment, root surfaces are susceptible to cervical lesions which can be both carious and non-carious. [4] Additionally, many patients consider these changes to be unappealing. Thus, the need for aesthetics, insufficient gingival width, root hypersensitivity and difficulty in maintaining proper oral hygiene could all be related to the criteria for treating gingival recessions. [5]

The ultimate goal of periodontal recession treatment is to cover the recession defect. Thus, most efforts are focused on developing techniques that provide root coverage. [6] Treatment for gingival recession may be viewed as a multifactorial strategy that includes several graft materials and surgical methods. The most preferred and well-documented method is the closure of gingival recession with the help of an autogenous connective tissue graft (CTG) taken from the palate along with coronally advanced flap (CAF) technique. [7]

Connective tissue graft (CTG) may act as a biological filler, improving the adaptation and the stability of the flap to the roots of the teeth. Therefore, a high probability of achieving complete root coverage together with increased soft tissue thickness has previously been attributed to CTG based approaches. [8] This case report aims to present the therapeutic results of the coronally advanced flap technique with connective tissue graft originating from the palatal area for root coverage.

Case 1:

The patient is 38 years old female, non-smoker who reported to the OPD of Periodontics Dr. R. Ahmed Dental College and Hospital, Kolkata with no systemic diseases and no intake of medicaments. She complains of bleeding from the gums and sensitivity of tooth in the upper right tooth region for the past six months. On intra-oral examination, plaque was found on all teeth with bleeding on probing in certain areas. A gingival recession of 2 mm was found in respect to tooth #14. No mobility of tooth was noted. Medical history and periodontal status (probing depth, recession depth, clinical attachment level (CAL), the height of keratinized gingiva) were recorded. The diagnosis for tooth #14 was mucogingival deformities (Miller class I recession). The treatment plan carried out is to carry out the phase I therapy (dental health education and motivation, scaling root planing, etc,) and re-evaluation phase, followed by maintenance phase (phase 4) and then surgical treatment (phase 2)-namely Coronally advanced flap + CTG at #14.

Local infiltration anaesthesia was administered in the working area using 2% lignocaine with adrenaline (1:80,000). The technique is introduced by two horizontal incisions in the zone of interdental papillae, being distant from the tip of the anatomical papillae, and equal to the height (3mm) of the gingival recession. These horizontal incisions are coronally to the cemento-enamel junction (CEJ) at the mesial and distal line axis of the tooth and are followed by two apically divergent vertical releasing incisions, extending 3-4 mm apically into the alveolar lining mucosa (Figure 1).

The releasing incisions facilitate displacement of the coronally advanced flap. A split-thickness

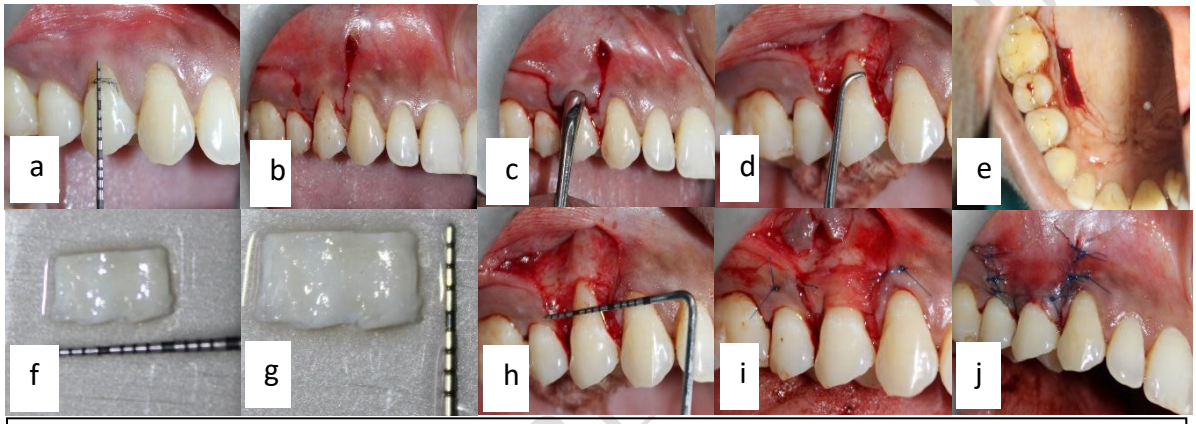

Figure 1. Coronally advanced flap procedure of tooth #14. (a) 2 mm recession depth. (b) incision design. (c) flap elevation full thickness at recession buccal side (d) root planing. (e) donor site. (f, g) measurement of CTG 10mm X 4mm. (h) the recipient bed. (i) CTG sutured at the recipient bed (j) flap is coronally advanced 2mm coronal to CEJ with sling suture technique.

flap is elevated mesially and distally to the recession by sharp dissection with a 15c blade held in parallel to the root surface and connected with an intracrevicular incision. A full-thickness flap is elevated apically to the receded soft tissue margin on the facial aspect of the root. This makes it possible to maintain the gingival tissues' full thickness apically to the recession. The full-thickness elevation is continued approximately 3 mm apically to the bone dehiscence, and then a horizontal incision is made through the periosteum to facilitate the displacement of the flap and reduce the muscle tension in time of suturing. A root planing of the exposed root surface is made, but the root surface in the zone near to the anatomical bone dehiscence must be avoided during root planning, due to damaging of the connective tissue fibers inserting into the cementum near the bone crest. The root planing is continued until a smooth, clean, and hard root surface is obtained.

The connective tissue graft preparation is performed on the right upper palate by making an incision at a 90-degree angle at 2mm below the gingival margin on the right palate in regions 14, 15 and 16 with a rectangular shape. A graft of size 10mm X 4 mm is harvested.

After taking the graft, the CTG graft is immersed in normal saline. The harvested graft is de-epithelialized using a 15-number blade. The CTG is placed in recipient site and then sutured with 5-0 polyglycolic acid (vicryl) suture until the CTG is stable. The flap is placed 2 mm more coronal than the CEJ of tooth 14 and sutured using the sling suture technique.

Post-operative care:

- Post-operative instructions were given. 0.2% chlorhexidine rinse solution was prescribed two times daily and the patient was informed not to brush the surgical area until the surgical sutures are removed.
- The patient was prescribed antibiotics and analgesics for 5 days.
- The sutures were removed after two weeks.

The patient was followed up after 1 month. At 6 months follow-up, maximum root coverage was achieved, with CAL gain of 2 mm (Figure 2). The probing pocket depth was 1 mm and the keratinized tissue width was also increased from 1 mm to 4 mm.

Figure 2. Post-operative follow ups. (a) 1 month. (b) 6 months (c) measurement of recession coverage at 6 months. (d) Palatal donor site at 6 months.

Case 2:

A 40 years old male patient, former smoker, with no systemic diseases reported to the Department of Periodontics at Dr. R. Ahmed Dental College and Hospital Kolkata with a chief complaint of receding gums and sensitivity of tooth in the lower left tooth region. On intra-oral examination, plaque was found on all teeth with bleeding on probing in certain areas. A gingival recession of 4 mm was found in respect to tooth #33. Medical history and periodontal status (probing depth, recession depth, clinical attachment level (CAL), the height of keratinized gingiva) were recorded. The diagnosis for tooth #33 was mucogingival deformities (Miller class II recession). The treatment plan carried out is to carry out the phase I therapy (dental health education and motivation, scaling root planing, etc,) and re-evaluation phase, followed by maintenance phase and then surgical treatment-namely Coronally advanced flap + CTG at #33.

Local infiltration anaesthesia was administered in the surgical site using 2% lignocaine with adrenaline (1:80,000). Using a 15C blade, two horizontal and two oblique incisions were made, resulting in a trapezoidal shaped flap. (Figure 3)

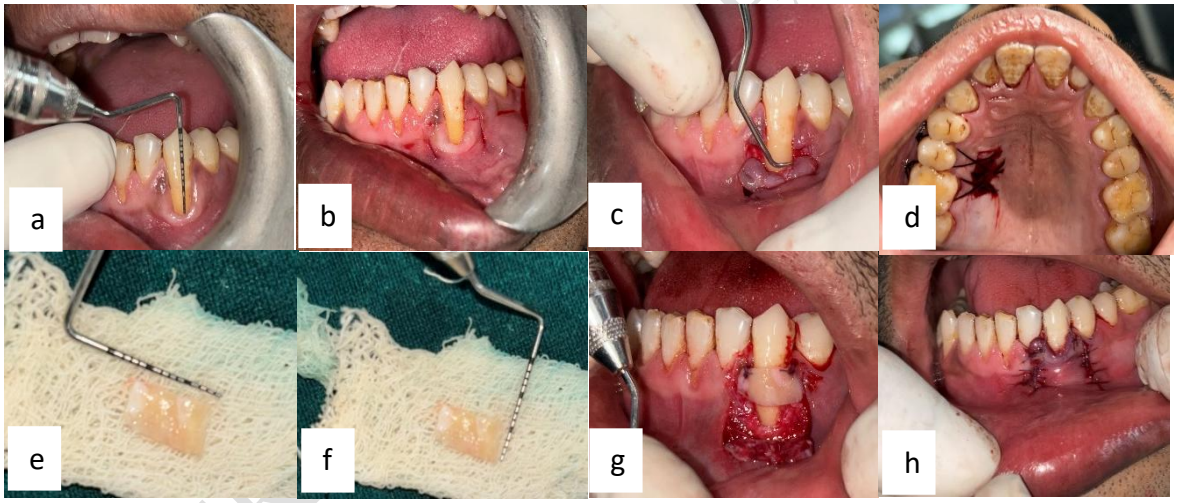

Figure 3. Coronally advanced flap procedure of tooth #33. a) 4 mm recession depth. b) incision design. c) root planing. d) donor site with sutures. (e, f) measurement of CTG 10mm X 6mm. g) CTG sutured at the recipient bed. h) flap is coronally advanced 1mm coronal to CEJ with sling suture technique.

The flap is elevated using a split–full–split approach in the coronal–apical direction: The surgical papillae are elevated split thickness. The soft tissue apical to the root exposure is elevated full thickness by inserting a small periosteal elevator into the sulcus to expose 3 mm of bone apical to the bone dehiscence. The lateral vertical incisions are elevated split thickness. Apical to the bone exposure flap, elevation continues split thickness. The elimination of muscle insertions from the flap allows its coronal advancement: the blade parallel to the bone allows a

deep incision to detach the lip muscle from the periosteum. Then, with the blade parallel to the mucosa, a superficial incision made the passive displacement of the flap coronally possible, with minimal lip tension.

The anatomic papillae are de-epithelized in order to receive the surgical papillae of the coronally advanced flap. The connective tissue graft is harvested from the right upper palate. A graft of size 10mm X 6 mm is harvested and suturing with 4-0 silk suture material was done in the palatal donor region.

After taking the graft, the CTG graft is immersed in normal saline. The harvested graft is de-epithelialized using a 15-number blade. The CTG is placed in recipient site and then sutured with 5-0 polyglycolic acid (vicryl) suture until the CTG is stable. The flap was placed 2 mm more coronal than the CEJ of tooth #33 and sutured using the sling suture technique.

Post-operative care was similar to case 1. The patient was followed up after 1 month. At 6 months follow-up, maximum root coverage was achieved with CAL gain of 4 mm (Figure 4). The probing pocket depth was 1 mm and the keratinized tissue width was also increased from 1mm to 3 mm.

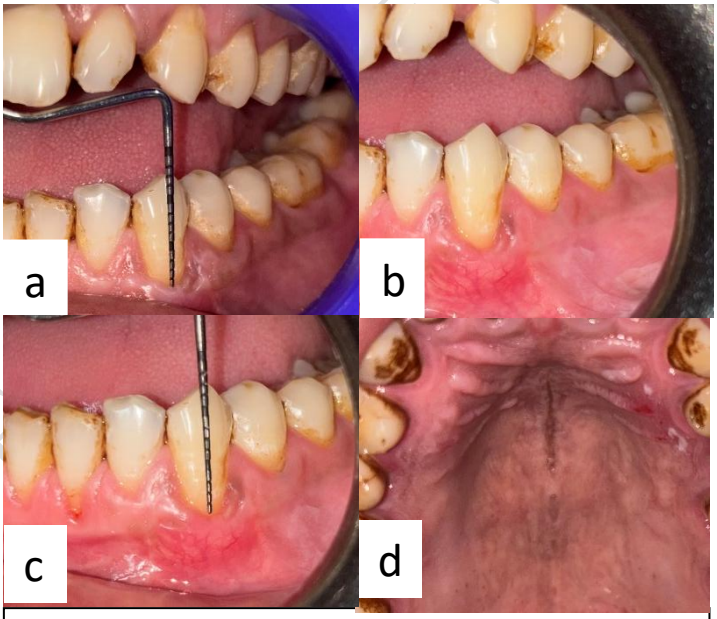

Figure 4: Post-operative follow up: a) 1 month. b) 6 months. c) measurement of recession coverage at 6 months. d) Palatal donor site at 6 months

Discussion:

Patients who suffer from plaque retention, dentin hypersensitivity, crown lengthening and gingival irritation might find gingival recessions to be an unpleasant condition. Mucogingival surgery is used to treat such GRs in order to fully cover the roots and meet the patient's aesthetic preferences; after healing, the soft tissues should have the same colour, thickness and surface texture as the surrounding soft tissues. [5]

Coronally advanced flap alone, or in combination with subepithelial connective tissue grafts, guided tissue regeneration (GTR) or other biomaterials are surgical techniques that can be used for root coverage in the treatment of localized or multiple recession-type defects. [8] When gingival recession occurs in one or more teeth, a coronally advanced flap with CTG is considered the gold standard method for covering the roots. With exposed root surfaces and sufficient apical keratinised tissue thickness and height, this method effectively treats Miller class I and class II gingival recession.

The goal of the bilaminar connective tissue graft procedure is to improve the gingival and supraperiosteal blood supply to the tissue graft. The recipient area, the interdental papilla, and the flap covering the graft are used to provide nutrition and revascularisation while the graft is positioned over the recession area. [9] The introduction of connective tissue graft (CTG) and the increasing switch from free gingival graft (FGG) to CTG represents a transition from traditional mucogingival surgery to periodontal plastic surgery. The ultimate aesthetic outcome should be the main objective of current periodontics, even though traditional mucogingival techniques are primarily focused on increasing keratinised tissue width (KTW). Many studies have demonstrated that CTG is the preferred method for restoring gingival/mucosal recession at the locations of teeth and implants, thickening soft tissues, masking obvious discolouration of roots or implant components and re-establishing interdental papillae. [8] Through the supraperiosteal vessels and the flap that covers it, the combination of CTG + CAF increases the graft's vascularization and creates a double blood supply. In comparison to the FGG, it showed greater aesthetic outcomes and higher success rates in terms of full root coverage because it matches the pre-existing mucosa's colour. [10]

Our result agrees with a meta-analysis reporting that CAF+CTG is more effective in term of complete root coverage, recession reduction and keratinised tissue (KT) gain in recession type RT1 and RT2, compared to CAF alone. [11] CAF+CTG had better probability in keratinized tissue regeneration, it helps to gain more KTW compared to others techniques. [12,13] In patients with a thin gingival biotype, the gingival biotype consistently thickens by 0.7 mm and the apico-coronal dimension of KT increases. [14] The graft would induce the formation of keratinized gingiva. [8] However, the genetic component can account for the increase in KT height following CAF. It usually restores the muco-gingival line's normal coronal displacement during surgery. [15]

In single Miller class I/II gingival recession with short-term follow-up (of at least 6 months), CAF + CTG is considered to be the most appropriate strategy in terms of clinical outcomes and cost-benefit ratio. [5] When it came to alterations in clinical attachment levels, CTG + CAF produced more benefits than platelet-rich fibrin (PRF) + CAF. In the same manner, CAF+CTG produced favourable findings regarding the percentage of RC, followed by CAF + acellular dermal matrix + platelet rich plasma. [13]

The main negative effect of the procedure was discomfort, whether or not it was related to pain. This condition, which was associated with CTG donor sites, mostly appeared in the first week following surgery and had little impact on the outcome of recession coverage. [16]

According to Bertl et al (2021) after comparing the mean residual recession depth values after 6 or 12 months to the final outcome, it appears that the only intervention for which a creeping attachment became apparent was CAF + CTG. [17]

Conclusion:

The clinical case's findings agree with those documented in the literature. The best way to achieve a harmonised root coverage of class I and class II of Miller gingival recession appears to be to combine CAF with CTG. Patient long term results are stable and satisfying. The only limitation is related to the morbidity of the technique. Nevertheless, this disadvantage could be overcome by prescribing medication.

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