

Minimally Invasive Gingival Recession Coverage Techniques- A Case Report

Dr. Ashutosh Srivastava¹, Dr. Zeba Rahman Siddiqui², Dr. Sanjay Gupta³

1. Post Graduate Student, 2 Associate Professor, 3 Professor And Head Department Of Periodontology And Oral Implantology, Career Post Graduate Institute Of Dental Sciences & Hospital, Lucknow, U.P, India.

Abstract-

Gingival recession is among the most prevalent aesthetic disorders pertaining to the periodontal tissues. The exposure of root surfaces as a result of the gingival tissue borders migrating apically to the cemento-enamel junction is known as gingival recession. Marginal tissue recession is linked to cosmetic complaints, a propensity for root caries, and thermal and tactile sensitivity, albeit it seldom causes tooth loss. A significant amount of research supports the use of traditional corrective procedures, such as envelope flaps, pedicle flaps, and coronally advanced flaps (CAFs), with or without the addition of a subepithelial connective tissue graft (SCTG). Minimally invasive surgical methods that can produce respectable cosmetic results with less patient suffering are currently gaining popularity.

Index Terms- Gingival Recession, Minimally Invasive Techniques, Root Coverage Procedures, Tunneling Technique, Periodontal Plastic Surgery, Minimally Invasive Periodontal Surgery.

Date of Submission: 06-01-2025

Date of Acceptance: 16-01-2025

I. Introduction

Nearly all people in their middle and later years are somewhat impacted by the gingival recession. The apical migration of the gingival margin to the cemento-enamel junction (CEJ) is known as gingival recession. The degree of recession is indicated by the separation between the gingival margin and the CEJ. Periodontal disease, accumulations, inflammation, forceful tooth brushing, poor flossing, faulty occlusal connections, and dominating roots are some of the causes of gingival recession. These may manifest as gingival recession, either localized or widespread.¹ Recession may or may not be accompanied by the loss of connected tissue. Although the aging process may make GR more likely, it is not a cause of GR; rather, it is age-associated rather than age-related. Reduced local vascularization of the gingiva and sublethal cell aggression resulting from compression are the hallmarks of GR, which can impact one or more root surfaces and cause a decrease in the volume and cell population of the gingival tissues. One However, maintaining morphological integrity and improving gingival attachment require a sufficient mucogingival complex.²

Traditional methods for treating GR involve combining different flap designs with subepithelial connective tissue grafts (SCTG) and whole or partial epithelialized free gingival grafts (FGG). Tunneling techniques and their variations have become more significant in the therapy of GR as a result of growing awareness of minimally invasive surgery. Among the changes is Sculean's laterally closed tunneling technique, which was intended to improve soft tissue aesthetics and root coverage.³

This case report highlights the minimally invasive techniques for recession coverage.

Case-1

A 26-year-old male patient reported to the department with a complaint of sensitivity in the upper left anterior teeth region for two months. The patient had no relevant medical history. Intraoral examination revealed good oral hygiene. Periodontal examination revealed Miller's Class I GR on the maxillary left first canine. Applying Cairo's classification of GR left canine had Cairo's recession type 1 (RT-1) defect. (fig 1)



Fig. 1 Recession in maxillary canine

Procedure-

Informed permission was gained when the patients were informed about the surgical treatment. Three weeks before to surgery, scaling and root planing were completed, and the patient was given instructions on how to keep their teeth clean.

After local anesthesia, a horizontal incision of approximately 2-3 mm was made in the base of the vestibule just apical to the recession site in the case of a single recession defect; in the case of multiple recession sites, the horizontal incision was made in the inter-radicular area of two adjacent defect sites; a sulcular incision was made with the tip of the interdental papilla intact at both mesial and distal sites(**fig. 1b and 1c**); a tunneling instrument (transmucosal periosteal elevator) was inserted through the pinhole and used for blunt dissection(**fig. 1d**); the flap was then extended coronally and horizontally to allow for the elevation of two adjacent papillae on each side of the denied root(s). For stabilization suturing was done and composite button placed on tooth for intact suture(**fig. 1e**) and periodontal dressing were placed. For three days after surgery, 500 mg of amoxicillin three times a day and a pain reliever SOS were recommended. The patient was instructed to use mouthwash containing 0.2% chlorhexidine twice a day for 15 days and was not allowed to brush at the surgery location for 4 weeks. On the tenth day of the procedure, the dressing was taken off.

After 1 month followup the gingival recession area got covered and complaint of sensitivity got relieved.(**fig. 1f**)



Fig. 1a shows amount of keratinized gingiva. **1b** and **1c**. tunneling were made in both mesial and distal area. **1d**. tunneling instrument placed for blunt dissection. **1e**. suturing done. **1f**. 1 month post operative picture.

Case-2

A 26-year-old male patient reported to the department with a complaint of sensitivity in the upper right anterior teeth region for one month. The patient had no relevant medical history. Intraoral examination revealed good oral hygiene. Periodontal examination revealed Miller's Class I GR on the maxillary right central incisor. Applying Cairo's classification of GR, teeth had Cairo's recession type 1 (RT-1) defect. (**fig. 2**)



Fig. 2 Recession in Maxillary central incisor

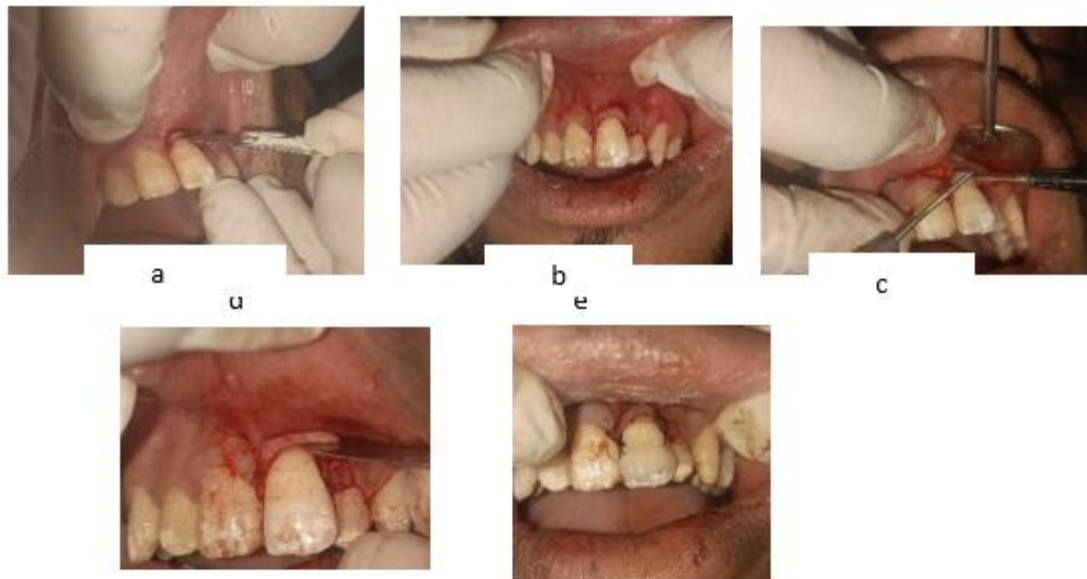
Procedure-

Informed permission was gained when the patients were informed about the surgical treatment. Three weeks before to surgery, scaling and root planing were completed, and the patient was given instructions on how to keep their teeth clean.

After adequate anesthesia, a scalloped incision in the attached gingiva and/or alveolar mucosa that parallels the gingival margin of adjacent teeth with recession defects. Coronally, the incision ends interproximally; however, 2 mm of the papillae adjacent to the defect is left undisturbed to provide adequate flap vascularization. **(fig. 2a and 2b)** A sulcular split-thickness incision is then made for all involved teeth, and the original semilunar incision is connected to the sulcular incision via a split-thickness flap. The mobilized flap is positioned coronally to cover the unwanted recessions, with the apical portion of the flap resting on bone, not root surface. **(fig. 2c and 2d)** The flap is held down with firm pressure for 5 to 10 minutes using a moist gauze to provide clot formation and flap stability. The suture were placed along with the composite button. **(fig. 2e)**

For three days after surgery, 500 mg of amoxicillin three times a day and a pain reliever SOS were recommended. The patient was instructed to use mouthwash containing 0.2% chlorhexidine twice a day for 15 days and was not allowed to brush at the surgery location for 4 weeks. On the tenth day of the procedure, the dressing was taken off.

After 1 month followup good result were found and the chief complaint of patient got subside.



2a and b. Semilunar incision given. 2c and d. elevation of semilunar flap and cover recession defect. 2e. suture place.

II. Discussion-

Since the marginal tissue may have been alveolar mucosa, the term "marginal tissue recession" is thought to be more accurate than "gingival recession."^{4,5} Gingival recession is more common in men and increases in frequency, severity, and extent with age. Recession describes the gingiva's position rather than its state. With the exception of its position, receded gingiva may be normal or inflammatory. One tooth or a collection of teeth may have recession, or it may spread throughout the entire mouth.⁶

Etiology:-

1. Anatomical / Developmental Factors:

- a. Dehiscence / fenestrations
- b. Tooth malposition
- c. Lack of attached gingiva
- d. Thin gingival biotype
- e. Root-bone angle
- f. Mesio-distal curvature of the tooth surface

2. Pathological factors:

- a. Periodontal disease

- b. Trauma from occlusion has been suggested in the past, but its mechanism of action has never been demonstrated.
- c. Abnormal frenum attachment.

3. Iatrogenic dentistry:

- a. Pressure from a poorly designed partial denture, such as an illfitting denture clasp, can cause gingival trauma and recession.
- b. Overhanging dental restorations
- c. Placing restorative margins within the biologic width.⁶

Classification of Gingival Recession -Classification is important for: diagnosis, prognosis, treatment planning, communication between clinicians.

a. Sullivan and Atkins 1968: It was 1st classifications proposed for gingival recession. The basis for the classification was depth and width of the defect.

- The four categories are: • Deep wide, • Shallow wide, • Deep narrow • Shallow narrow.⁷

b. Miller (1985) Primarily this classification of gingival recession is based on following aspects:

- A. Extent of gingival recession defects
- B. Extent of hard and soft tissue loss in interdental areas surrounding the gingival recession defects.

It is useful in predicting the final amount of root coverage following a free gingival graft procedure.

Class I: Marginal tissue recession not extending to the mucogingival junction (MGJ). No loss of interdental bone or soft tissue. 100% root coverage can be anticipated.

Class II: Marginal recession extending to or beyond the MGJ. No loss of interdental bone or soft-tissue. 100% root coverage can be anticipated

Class III: Marginal tissue recession extends to or beyond the MGJ. Loss of interdental bone or soft-tissue is apical to the CEJ, but coronal to the apical extent of the marginal tissue recession or there is a mild malpositioning of the tooth, this prevents the attempting 100% of root coverage.

Class IV: Marginal tissue recession extends to or beyond the MGJ. Loss of interdental bone extends to a level apical to the extent of the marginal tissue recession or malpositioning of tooth is so severe that root coverage cannot be anticipated.⁷

c. Cairo et al. (2011) Based on the assessment of CAL at both buccal and interproximal sites.⁸

Recession Type 1: Gingival recession with no loss of interproximal attachment. Interproximal CEJ was clinically not detectable at both mesial and distal aspects of the tooth.

Recession Type 2: Gingival recession associated with loss of interproximal attachment. The amount of interproximal attachment loss (measured from the interproximal CEJ to the depth of the interproximal pocket) was less than or equal to the buccal attachment loss (measured from the buccal CEJ to the depth of the buccal pocket).

Recession Type 3: Gingival recession associated with loss of interproximal attachment. The amount of interproximal attachment loss (measured from the interproximal CEJ to the depth of the pocket) was higher than the buccal attachment loss (measured from the buccal CEJ to the depth of the buccal pocket).

d. Classification of Palatal Gingival Recession. The position of interdental papilla is the basis of classifying gingival recession on palatal aspect of maxillary arch as there is absence of MGJ on palatal aspect.⁷

Palatal recession I There is no loss of interdental bone or soft tissue.

This is sub-classified into two categories-

- **Palatal recession-IA (PR-IA):** Marginal tissue recession ≤ 3 mm from CEJ.
- **PR-IB:** Marginal tissue recession > 3 mm from CEJ.

Palatal recession II- The tip of the interdental papilla is located between the interdental contact point and the level of the CEJ mid-palatally. Interproximal bone loss is visible on the radiograph.

This is sub-classified into two categories:-

- **PR-IIA:** Marginal tissue recession ≤ 3 mm from CEJ.
- **PR-IIB:** Marginal tissue recession > 3 mm from CEJ.

Palatal recession The tip of the interdental papilla is located at or apical to the level of the CEJ mid-palatally. Interproximal bone loss is visible on the radiograph.

This is sub-classified into two categories-

- **PR-IIIa:** Marginal tissue recession d^o3 mm from CEJ.
- **PR-IIIb:** Marginal tissue recession >3 mm from CEJ.

Surgical Techniques For Recession Coverage-⁹

- **Pedicle grafts:** They are so called because they maintain their connection to the donor site after placement at the recipient site.
 - a. Laterally repositioned ap
 - b. Double papilla ap
 - c. Oblique rotational flap

- **Free grafts:** They are so called because that are completely deprived of their connection with the donor area.
 - a. Epithelialized gingival grafts
 - b. Sub epithelial connective tissue graft

- **Guided Tissue Regeneration (GTR)**
- **Laterally Repositioned Flap.**

Minimally Invasive Recession Coverage Technique-

| S.No | Techniques | Indication | Advantage |
|------|--|--|---|
| 1. | Semilunar Technique | 1. Miller class I recession defects. 2. Cases where adequate keratinized tissue is present. 3. Cases where a thick gingival phenotype is present. ¹⁰ | 1. Lack of flap tension after coronal repositioning. 2. no need for sutures. 3. increased width of keratinized tissue ¹¹ |
| 2. | Tunneling Technique | 1. Miller class I, class II, and class III recession defects. 2. Multiple adjacent gingival recession defects. 3. Esthetic-zone defects. ¹² | 1. papillae preservation. 2. minimal scarring. 3. quick healing ¹³ |
| 3., | Vestibular Incision Subperiosteal Tunnel Access (VISTA) Technique | 1. Miller class I, class II, and class III recession. 2. multiple adjacent gingival recession defects 3. soft-tissue augmentations/enhancements around dental implants in the esthetic zone. ¹⁴ | 1. reduced surgical trauma to gingiva. 2. reduced flap tension. 3. allowance of broader surgical access. ¹⁵ |
| 4. | Pinhole Technique | 1. Miller class I, class II, and class III 2. multiple adjacent gingival recession defects 3. esthetic zone. | 1. good esthetic results. 2. minimal postoperative morbidity. 3. quick healing. ¹⁶ |
| 5. | Modified Tunneling Technique | 1. multiple adjacent gingival recession defects in the esthetic zone. 2. Miller class I, class II, and class III recession defects. ¹³ | 1. papillae preservation. 2. less technique-sensitive. 3. decreased flap/papilla tearing. |

III. Conclusion-

Minimally invasive techniques for gingival recession coverage have revolutionized periodontal plastic surgery by prioritizing patient comfort, reduced morbidity, and enhanced aesthetic outcomes. These approaches minimize surgical trauma, preserve vascular supply, and improve post-operative recovery, making them a preferred choice for both clinicians and patients. Evidence supports their efficacy in achieving predictable root coverage, improving periodontal health, and enhancing patient satisfaction. While these techniques require advanced skills and meticulous execution, their advantages in reducing complications and promoting rapid healing underscore their value in modern clinical practice.

References-

[1] Pradeep K, Rajababu P, Satyanarayana D, Sagar V. Gingival Recession: Review And Strategies In Treatment Of Recession. Case Reports In Dentistry. 2012;2012(1):563421.

[2] Jati As, Furquim Lz, Consolaro A. Gingival Recession: Its Causes And Types, And The Importance Of Orthodontic Treatment. Dental Press J Orthod. 2016;2:18–29.

[3] Newman Mg, Takei Hh, Klokkevold Pr, Carranza Fa. Periodontal Plastic And Esthetic Surgery. St Louis Missouri: Saunders Elsevier. 2006:1023-5.

- [4] Wennström JI. Mucogingival Therapy. *Ann Periodontol* 1996; 1:671-701. 3.
- [5] Consensus Report. Mucogingival Therapy. *Ann Periodontol* 1996; 1:702-6.
- [6] Anarthe R, Mani A, Kale Pp, Mustilwar R. Gingival Recession At Glance: A Review. *Pravara Medical Review*. 2018 Dec 1;10(4).
- [7] Kumar A And Masamatti Ss. A New Classification System For Gingival And Palatal Recession. *J Indian Soc Periodontol* 2013; 17:175-81.
- [8] Cairo F, Nieri M, Cincinelli S, Mervelt J And Pagliaro U. The Interproximal Clinical Attachment Level To Classify Gingival Recessions And Predict Root Coverage Outcomes: An Explorative And Reliability Study. *J Clin Periodontol* 2011; 38:661- 6.
- [9] Zucchelli, G., Cesari, C., Amore, C., Montebugnoli, L., De Sanctis, M., 2004. Laterally Moved, Coronally Advanced Flap: A Modified Surgical Approach For Isolated Recession-Type Defects. *J. Periodontol.* 75 (12), 1734–1741.S
- [10] Minimally Invasive Periodontal Therapy Clinical Techniques And Visualization Technology By Harrel.
- [11] Bittencourt S, Del Peloso Ribeiro E, Sallum Ea, Et Al. Semilunar Coronally Positioned Fl Ap Or Subepithelial Connective Tissue Graft For The Treatment Of Gingival Recession: A 30-Month Follow-Up Study. *J Periodontol.* 2009;80(7):1076-1082.
- [12] Mahn Dh. Treatment Of Gingival Recession With A Modifi Ed “Tunnel” Technique And An Acellular Dermal Connective Tissue Allograft. *Pract Proced Aesthet Dent.* 2001;13(1):69-74.
- [13] Sculean A, Cosgarea R, Katsaros C, Et Al. Treatment Of Single And Multiple Miller Class I And Iii Gingival Recessions At Crown-Restored Teeth In Maxillary Esthetic Areas. *Quintessence Int.* 2017;48(10):777-782.
- [14] Gil A, Bakhshalian N, Min S, Zadeh Hh. Treatment Of Multiple Recession Defects With Vestibular Incision Subperiosteal Tunnel Access (Vista): A Retrospective Pilot Study Utilizing Digital Analysis. *J Esthet Restor Dent.* 2018;30(6):572-579.
- [15] Reddy Ssp. Pinhole Surgical Technique For Treatment Of Marginal Tissue Recession: A Case Series. *J Indian Soc Periodontol.* 2017;21(6):507-511
- [16] Chao Jc. A Novel Approach To Root Coverage: The Pinhole Surgical Technique. *Int J Periodontics Restorative Dent.* 2012;32(5):521-531.