ORIGINAL RESEARCH PAPER
Volume - 15 | Issue - 08 | August - 2026 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

GINGIVAL RECESSION COVERAGE BY MODIFIED PIN HOLE SURGICAL TECHNIQUE: A NOVEL MINIMAL INVASIVE APPROACH

Periodontology

Dr Dhruv Dubey MDS (Periodontics), Command Military Dental Centre, Udhampur, Jammu and Kashmir 182121, India.

Dr Shreehari AK MDS (Periodontics), Command Military Dental Centre, Udhampur, Jammu and Kashmir 182121, India.

Dr Prasanth T MDS (Periodontics), Command Military Dental Centre, Udhampur, Jammu and Kashmir 182121, India.

Dr Nitin Gupta MDS (Periodontics), Division of Periodontolgy, Dept. of Dental Surgery and Oral Health Sciences, Armed Forces Medical College, Pune, Maharashtra 411040, India.

Dr Vijay Lal H E MDS (Periodontics), Military Dental Centre, Thiruvananthapuram, Kerala 695006, India.

ABSTRACT

Gingival recession is the most common mucogingival defect in the oral cavity. Many surgical techniques have been described for correction of the gingival recession, with varying proportions of patient acceptance and prognosis. We report two cases of gingival recession treated by a relatively new minimal invasive procedure "Modified Pin Hole Surgical Technique". The procedure is associated with the least patient comorbidities as there is no requirement of an additional donor site, and a minimum incision and flap reflection is needed for the root coverage. Both cases reported excellent post operative uneventful healing and satisfactory recession coverage.

KEYWORDS

Gingival Recession, Mucogingival Defect, Modified Pin Hole Surgical Technique.

INTRODUCTION

Gingival recession is defined as the apical shift of the marginal gingiva from its normal position on the crown of the tooth to levels on the root surface beyond the cemento-enamel junction.[1] It is one of the most common mucogingival defect encountered in our day to day practice, and not only presents with the symptoms of dental hypersensitivity, but is also an aesthetic concern for the patient.

Root coverage procedures are a subgroup of periodontal plastic surgical techniques as described by the American Academy of Periodontology, in its World Workshop in Clinical Periodontics in 1996.[2] Over decades various modalities of gingival recession coverage have been described. These include the coronally advanced flaps[3,4], free gingival grafts[5], pedicle grafts[6,7], connective tissue grafts [8,9], guided tissue regeneration techniques[10], and tunnel approaches[11]. Each of these procedures have been tried to various degrees of success, and each one is indicated for certain specific case depending on varied patient factors.

In the year 2012, John Chao described an alternative technique for root coverage, which required minimal surgical intervention with exceptional clinical results, and no secondary donor site.[12] According to him success of this procedure owed to minimum disruption of the vasculature of the surgical site leading to excellent tissue healing. This procedure calls for stab incisions in the alveolar mucosa apical to the recession. Using specialized instruments, a split thickness flap is elevated in the apico-coronal direction, elevating the interproximal papillae on either side of the recession defect. A scaffold is created by inserting fine pre-cut strips of bioresorbable membrane through the incision, to create a gingival fullness which covers the denuded root surface. The procedure is indicated for Millers class I and II recession defects ≤ 3mm. A modification to this technique was devised and tried by our surgical team, to gain results at par to the original procedure.

CASE REPORTS

Case-1

A 35-year-old male reported to the tertiary care service dental centre with the chief complaint of elongated front teeth in the lower jaw since the last 18 months, with increasing severity. The patient was otherwise systemically healthy, and the past dental and family history were non-contributory. He was a non-smoker, with no other deleterious oral habits, and brushed twice daily with the vertical method of brushing. The patient was well oriented to time place and person, adequately nourished, moderately built, and with normal gait. Extra oral examination revealed a bilaterally symmetrical face with no scar, swelling or sinus, and convex lateral profile. He presented with a mouth opening of 40mm and lip competency which was adequate at rest. Temporomandibular joints were normal on palpation, auscultation, and deviational movements.

Intra oral examination revealed a full complement of dentition with no wasting diseases of the teeth. The patient's the oral hygiene was assessed as fair.[13] Gingival examination revealed pink, firm and resilient gums, with normal knife edge arcuate pattern and stippling absent. Millers class II gingival recession was observed in relation to right and left mandibular central incisors. The teeth also presented with inadequate attached gingiva which probably hampered the oral hygiene maintenance, leading to the recession. Periodontal examination revealed the recession amounting to 3mm [Figure 1] with a periodontal probing depth of 2mm in relation to both the teeth. Thus a total loss of clinical attachment amounting to 5mm was observed. Intra oral periapical radiographs of the concerned region were taken, and a diagnosis of localized severe chronic periodontitis with Millers class II gingival recession was arrived at in relation to tooth no. 31 and 41.

The patient was briefed about the surgical procedure, institutional ethical committee clearance was obtained, and an informed consent was taken from the patient. Pre surgical patient preparation was done with 7% povidine iodine solution scrub extra orally and 0.2% chlorhexidine rinse intra orally. The surgical site was anaesthetized using 2% lignocaine solution with 1:80000 adrenaline.

Using a no.11 scalpel (Bard-Parker), a stab incision was made in the alveolar mucosa in the vestibular region, apical to each of the central incisors [Figure 2]. Using a sharp Orbans interdental knife (original technique used specialized Trans Mucosal Papilla Elevators or TMPEs®) a full thickness flap was elevated in the apico-coronal direction. The blunt dissection was carried up to the facial aspect of the interproximal papilla on either side of the tooth no. 31 and 41, without severing the whole papillae [Figure 3]. The flap elevation was guided by observing the movement of the Orbans knife through the mucosa and gingival tissue. Once the desired flap elevation was achieved, small strips (1mm×2mm) of bioresorbable membrane (Progide®) cut and soaked in physiologic saline, were inserted underneath the flap, from the initial incision site [Figure 4]. This created a gingival fullness and apposed the flap towards the Cemento enamel junction. The membrane strips were inserted till the desired root coverage was achieved passively in the coronal direction. The flap was stabilized in this position by two non resorbable sutures (5 0 silk) anchored to one orthodontic bracket cemented to each of the two incisor teeth (Fig. 5). The initial stab incision sites were sutured using a resorbable material (Vicryl®). No periodontal pack was used over the surgical site. Antibiotic (Amoxicillin 500mg + potassium clavulanate 125mg thrice daily × 5 days), and analgesic (Ibuprofen 400mg + paracetamol 325mg twice daily × 3 days) were prescribed. The patient was asked to abstain from brushing at the surgical site till 2 weeks post operatively. He was advised to use 0.2% chlorhexidine gluconate solution as a mouth rinse till the time mechanical plaque control was reinstated. The healing was

uneventful. Non resorbable sutures were removed 2 weeks post operatively. The Mean percent defect coverage derived from measuring initial and follow-up recession on study casts (96.5%) was compared to that obtained from intraoral measurements (99%). Since there was no significant difference between the two, the clinical data with respect to recession were further confirmed.

Almost complete root coverage was achieved for the both the lower central incisors and maintained at 1 month postoperatively [Figure 6]. The patient is due for follow up visit at 3 month and 6 months post operatively.

A Visual analogue scale (VAS) based patient feedback was obtained 01 month post operatively on outcomes such as esthetic satisfaction, intensity and duration of postoperative pain, bleeding, reduction in sensitivity, and overall satisfaction.

Fig 1. Gingival Recession Millers Cl III lower Central Incisors.

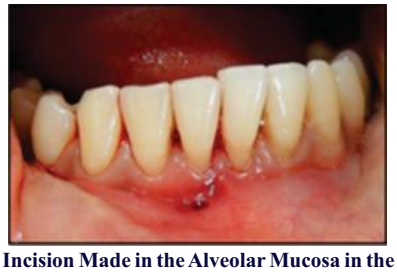

Fig 2. Stab Incision Made in the Alveolar Mucosa in the Vestibular Region Apical to Each of the Lower Central Incisors.

Fig 3. Using a Sharp Orbans Interdental Knife a Full Thickness Flap Was Elevated in the Apico-coronal Direction. The Blunt Dissection was Carried Up to the Facial Aspect of the Interproximal Papilla on Either Side of the Both the Lower Central Incisors, Without Severing the Whole Papillae.

Fig 4. Once The Desired Flap Elevation Was Achieved, Small Strips (1mm×2mm) Of Bioresorbable Membrane (progide®) Cut And Soaked In Physiologic Saline, Were Inserted Underneath The Flap, From The Initial Incision Site To Create A Gingival Fullness And Apposed The Flap Towards The Cementoenamel Junction.

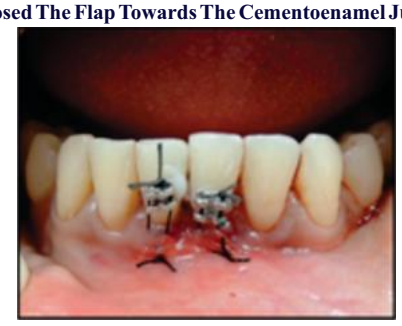

Fig 5. The Flap Was Stabilized In This Position By Two Non-resorbable Sutures (5 0 Silk) Anchored To One Orthodontic Bracket Cemented To Each Of The Two Incisor Teeth.

Fig 6. Almost Complete Root Coverage Was Achieved For The Both The Lower Central Incisors And Maintained At 3 Month Postoperatively.

Case-2

A 42 year old male reported to the tertiary care service dental centre with the chief complaint of sensitivity in the lower front teeth since the last 6 months, with increasing severity. A detailed case history was recorded, which revealed that the patient was systemically healthy and was on no medications for any underlying disease or condition. His dental and family history were non-contributing, and had a fair oral hygiene. [13] Gingival examination revealed a Millers class II gingival recession in relation to the tooth no. 41, with inadequate attached gingiva [Figure 7]. Periodontal examination revealed the recession amounting to 2mm with a periodontal probing depth of 2mm in relation to the tooth concerned. Intra oral periapical radiographs were taken to arrive at a definitive diagnosis. Thus a total loss of clinical attachment amounting to 4mm was observed and a diagnosis of localized moderate chronic periodontitis with Millers class II gingival recession was arrived at in relation to tooth no. 41.

The patient was briefed about the surgical procedure, institutional ethical committee clearance was obtained, and an informed consent was taken from the patient. Pre surgical patient preparation was done with 7% povidine iodine solution scrub extra orally and 0.2% chlorhexidine rinse intra orally. The surgical site was anaesthetized using 2% lignocaine solution with 1:80000 adrenaline.

A similar modified pin hole surgical technique was followed for the patient as described in the previous case. Following the initial stab incision apical to 41 in the alveolar mucosa [Figure 8], a blunt dissection was carried out in the apico-coronal direction using a modified Orbans interdental knife, till the flap passively acquired a position just coronal to the Cemento enamel junction, to completely cover the recession defect. 1mm ×2mm strips of bioresorbable membrane, wetted in physiological saline were now packed under the flap through the initial stab incision [Figure 9]. This was carried out till a sufficient gingival fill, covering the entire recession defect was obtained, and maintained passively. Additional flap retention was reinforced using anchoring silk sutures through a lingual button cemented on the labial surface of the crown of the mandibular central incisor [Figure 10]. Vicryl sutures were placed at the initial incision site. Post-operative antibiotics and analgesics were prescribed to the patient as in the previous case. Instructions were imparted and oral hygiene methods were explained to the patient. Suture removal was done 2 weeks post operatively, and the healing was uneventful. The Mean percent defect coverage derived from measuring initial and

follow-up recession on study casts (98%) was compared to that obtained from intraoral measurements (100%). Since there was no significant difference between the two, the clinical data with respect to recession were further confirmed.

Excellent clinical results were obtained using this procedure and total root coverage was achieved and maintained at 1 month post operatively [Figure 11]. The patient is still under a follow up, scheduled at 3 and 6 month post operatively.

A Visual analogue scale (VAS) based patient feedback was obtained 01 month post operatively on outcomes such as esthetic satisfaction, intensity and duration of postoperative pain, bleeding, reduction in sensitivity, and overall satisfaction.

Fig 7. Gingival Recession Millers Cl III Lower Right Central Incisor.

Fig 8. Stab Incision Made in the Alveolar Mucosa in the Vestibular Region Apical to Each of the Lower Right Central Incisor.

Fig 9. Once the Desired Flap Elevation was Achieved Using Modified Orbans Interdental Knife, Small Strips (1mm×2mm) of Bioresorbable Membrane (progide®) Cut and Soaked in Physiologic Saline, Were Inserted Underneath the Flap, From the Initial Incision Site to Create a Gingival Fullness and Apposed the Flap Towards The Cementoenamel Junction.

Fig 10. The Flap Was Stabilized in this Position by Two Non-resorbable Sutures (5 0 Silk) Anchored to One Orthodontic Bracket Cemented to Each of the Two Incisor Teeth.

Fig 11. Almost Complete Root Coverage was Achieved for the Lower Right Central Incisor and Maintained at 3 Month Postoperatively.

DISCUSSION

Root coverage procedures form an integral part of periodontal plastic surgeries. Gingival recession is defined as the apical shift of the marginal gingiva from its normal position on the crown of the tooth to levels on the root surface beyond the cemento-enamel junction.[1] It not only presents with the symptoms of dental hypersensitivity but is also an esthetical concern for the patient. Application of periodontal microsurgery in correction of gingival recession is a fast-gaining modality, because of excellent surgical accuracy and precise tissue apposition.

The most important factor of outcome of root coverage procedures is the predictability of root coverage (≥ 90%). [14] While predictability is measured by frequency of defect cover- age, effectiveness is measured by mean percent defect coverage.[15] The original 'Pin Hole' technique study by John Chow reported near complete coverage was achieved 90.6% of the time for Class I and II sites and in 77.7% of all sites, of which 29.7% were Class III.[12] This study only included patients with Miller's Class II gingival recession with gingival recessions of 3mm and 2mm in the two cases discussed as above. The percentage of recession coverage were 99% at 1 month post operative follow up for the first case and 100% at 1 month post operative follow up for the second case. The surgical technique followed was as described by Dr. John Chow [12], with a slight modification of stabilizing the coronally augmented gingiva by anchoring sutures supporting the displaced gingiva by silk sutures to the orthodontic bracket/ lingual button cemented to the facial aspect of the affected tooth. This modification in the technique proved highly effective in holding the repositioned tissue at the desired level during the healing period and further preventing any post operative tissue retraction due to local and physiological factors.

This minimal invasive technique also ensures maximum tissue retention post operatively, as the surgical site created and augmented receives dual blood supply through the underlying tissue base and the overlying gingival flap, thus increasing the positive prognosis of the periodontal plastic technique.

Patient-based outcomes such as esthetic satisfaction, intensity and duration of postoperative pain, bleeding, reduction in sensitivity, and overall satisfaction are important and relevant considerations in root coverage procedures. [16,17,18] A Visual analogue scale (VAS) based patient feedback was obtained 01 month post operatively on outcomes of esthetic satisfaction, intensity and duration of postoperative pain, bleeding, reduction in sensitivity, and overall satisfaction.

In both the cases 100% esthetic satisfaction and overall satisfaction were reported by the patients. Minimal post operative discomfort and operative site bleeding were reported by the patients. The site sensitivity was reported to be significantly reduced in both the cases as reported 01 month post operatively. These parameters were were thought to be much better as compared to other root coverage procedures due to the minimally invasive technique used in the procedure. Also the healing of the surgical site was excellent due to the full coverage of the graft placed in situ and the anchorage support provided by the sutures modified for this procedure.

CONCLUSION

"Modified Pin Hole Surgical Technique" for Miller's Class I and Class II gingival recession coverage is a novel approach towards more traditional periodontal plastic procedures and is associated with least patient comorbidities as there is no requirement of an additional donor site, and a minimum incision and flap reflection is needed for the root coverage. Moreover the technique requires vestibular incision approach rather than conventional coronal flap retraction as in other recession coverage techniques[8] which explains absence of any iatrogenic or surgical induced loss of marginal soft tissue. The modification applied in the present technique ensures excellent tissue support during the healing phase and holds the desired tissue level to cover the gingival recession. Thus the 'Modified Pin Hole Surgical Technique' offers a reliable and stable gingival recession coverage for Miller's Class I and Class II recessions with excellent post operative uneventful healing and patient satisfaction.

Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient

consent forms. The patients have given due consent to report his/her images and other clinical information for publication. The patients understand that their names will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial Support and Sponsorship
Nil.

Conflict of Interest
The authors have none to declare.

REFERENCES

1. Ochsenbein C. Newer concept of mucogingival surgery. J Periodontol 1960; 31:175-85.
2. American Academy of Periodontology: Proceedings of the 1996 World Workshop in Periodontics, Lansdowne, Virginia, July 13-17. Ann Periodontol 1(1):1–947, 1996.
3. Tarnow DP: Semilunar coronally repositioned flap. J Clin Periodontol 13:182, 1986.
4. Miller PD, Jr: A classification of marginal tissue recession. Int J Periodont Restor Dent 5:9, 1985.
5. Bjorn H. Free transplantation of gingiva propia. Sveriges Tandlak 1963; 22:684.
6. Grupe HE. Modified technique for the sliding flap operation. J Periodontol 1966; 37:491.
7. Grupe HE, Warren RF, Jr. Repair of gingival defects by a sliding flap operation. J Periodontol 1956; 27: 92.
8. Langer B, Langer L. Subepithelial connective tissue graft technique for root coverage. J Periodontol 1985; 56: 715.
9. Levine RA. Covering denuded root surface with the subepithelial connective tissue graft. Compend Contin Educ Dent 1991; 12: 568.
10. Pini-Prato G, Tinti C, Vincenzi G. Guided tissue regeneration versus mucogingival surgery in the treatment of human buccal gingival recession. J Periodontol 1992; 63: 919.
11. Zabalegui I, Sicua A, Cambra J, et al: Treatment of multiple adjacent gingival recessions with the tunnel subepithelial connective tissue graft: a clinical report. Int J Periodont Restor Dent 1999; 19: 199.
12. Chao JC. A Novel approach to root coverage: the pin hole surgical technique. Int J Periodontics Restorative Dent 2012; 32:521-31.
13. Greene JC, Vermillion JR. Oral hygiene research and its implications for periodontal care. J Dent Res 1971; 50: 184-93.
14. Greenwell H, Fiorellini J, Giannobile W, et al. Oral reconstructive and corrective considerations in periodontal therapy. J Periodontol 2005;76:1588–1600.
15. Maloney WJ, Weinberg MA. Implemen- tation of the American Society of Anesthesiologists Physical Status classification system in periodontal practice. J Periodontol 2008;79:1124–1126.
16. Rocuzzo M, Bunino M, Needleman I, Sanz M. Periodontal plastic surgery for treatment of localized recessions: A sys- tematic review. J Clin Periodontol 2002; 29:178–194.
17. Oates TW, Robinson M, Gunsolley JC. Surgical therapies for the treatment of gingival recession. A systematic review. Ann Periodontol 2003;8:303–320.
18. Pagliaro U, Nieri M, Franceschi D, Clauser C, Pini-Prato G. Evidence-based mucogingival therapy. Part l: A critical review of the literature on root coverage procedures. J Periodontol 2003;74:709–740.