

## Treatment of Miller's Class II Receding Gums Using Periosteal Reversal Technique: A Case File

Verma Malti Sanjeev Kumar<sup>1</sup>, Deepa Ramchand Paryani<sup>1</sup>, Vijayshree Pandey<sup>2</sup>, Madhuresh Tiwari<sup>2</sup>, Devesh Singh<sup>3</sup>, Sahir Sultan Ansari<sup>4</sup>, Garima Singh<sup>5\*</sup> and Sudhanshu Agrawal<sup>6\*</sup>

<sup>1</sup>PG Student (JR II), Department of Periodontology, Chandra Dental College and Hospital, Barabanki, India

<sup>2</sup>PG Student (JR I), Department of Periodontology, Chandra Dental College and Hospital, Barabanki, India

<sup>3</sup>PG Student (JR I), Department of Periodontology, DJ Dental College and Hospital, Modinagar, India

<sup>4</sup>B.D.S, M.P.H, Lucknow University, Lucknow, India

<sup>5</sup>Assistant Professor, Department of Periodontology, Chandra Dental College and Hospital, Barabanki, India

<sup>6</sup>Professor, Department of Periodontology, Chandra Dental College and Hospital, Barabanki, India

**\*Corresponding Author:** Sudhanshu Agrawal, Professor, Department of Periodontology, Chandra Dental College and Hospital, Barabanki, India and Garima Singh, Assistant Professor, Department of Periodontology, Chandra Dental College and Hospital, Barabanki, India.

**Received:** April 22, 2024; **Published:** May 02, 2024

### Abstract

Patients with gingival recession worry about the exposed root surface, hypersensitivity of the root, abrasion of the root surface, high rate of root caries, impaired control of plaque, and reduced aesthetics of restorative care. The surgical covering of the gingival recession's exposed root surface can fix all of these dental issues. The present case file was designed for treatment of receding gums by the periosteum reversal technique. A patient with Miller class II receding gums of 5.1 mm and 4.8 mm in relation to #11 and #21 and probing depth of 1.8 mm and 2.0 mm respectively was treated by the periosteal reversal technique. Using this method, a partial-thickness flap was created, and periosteum was reflected and reversed on the exposed root surface, which stays pedicle crestly, apical to recession. At the end of 12 months, 95% root coverage for #11 and #21 i.e. 4.8 mm and 4.5 mm respectively, and 1.5 mm and 1.8 mm respectively probing depth were obtained. Consequently, gingival recession can be effectively covered by using the periosteal reversal procedure.

**Keywords:** Uncovered Root Surface; Gingival Recession; Periosteum; Root Coverage

### Introduction

The term gingival recession refers to the exposure of the root surface in the oral cavity as a result of the junctional epithelium moving toward the root apex and becoming detached [1]. Patients experience aesthetic concerns due to gingival recession, which also compromises plaque control, root caries incidence, root hypersensitivity, and the aesthetics of restorative care [2].

A consistent layer of keratinized gingiva covering the exposed root surface has been one of the objectives of periodontal surgery. Because the root surface is avascular, most grafts cannot thrive on it, hence complete coverage of the bare root surface continues to be

problematic for most doctors. Any health professional's goal should be to not only stop and treat a disease process but also, in the case of root coverage operations, to regenerate any lost tissue. For both patients and physicians, the effectiveness and predictability of the various treatments are crucial factors to take into account. One patient-related element that needs to be taken into account is trying to minimize the total number of procedures and surgical sites that meet the patient's aesthetic requirements [1]. Therefore, keeping this view in mind; the present case file was designed for treatment of receding gums by the periosteum reversal technique in terms of achieving predictable root coverage.

### Case File

A 25-year-old female patient complaining of receding gums in upper front tooth region reported in the Department of Periodontology, Chandra Dental College and Hospital, Barabanki (UP) India. On intra-oral examination, Miller's class II receding gums at the upper central incisors (#11 and #21) was present due to plaque and calculus deposition. The receding gums was 5.1 mm and 4.8 mm in #11 and #21 respectively was recorded and as measured from cemento-enamel junction (CEJ) to gingival margin (Figure 1). Probing depth was measured from the bottom of the sulcus to the most coronal end of the gingival edge, and it was 1.8 mm and 2.0 mm, respectively (#11 and #21).



**Figure 1:** Preoperative clinical situation showing receding gums in #11, #21.

Coronally directed "roll" approach was recommended to reduce gingival margin stress during tooth brushing. Before treatment, written consent was taken and surgical technique was briefed to the patient. The Chandra Dental College and Hospital's Institutional Ethics Committee gave its approval for this study in Barabanki (UP).

The patient was told to use a 0.2% chlorhexidine solution as a preoperative rinse. A 5% povidone iodine solution was applied to the extraoral facial skin and the intraoral surgery site [5].

Following appropriate part preparation, the upper front tooth region was anesthetized with a mixture of 2% lignocaine HCL and 1:80,000 adrenaline. When local anesthesia becomes effective, two oblique vertical releasing incisions along line angle of adjoining teeth with receding gums were made beyond the mucogingival line and partial-thickness flap was raised (Figure 2). To get rid of any root surface deposits, the exposed root surface was meticulously cleansed using scale and root planing. To incise the periosteum at its apical end, a horizontal basal incision was made at the baseline (Figure 3). On the exposed root surface, it was reflected from the alveolar bone and the crestly pedicle periosteum was further reversed coronally. Next, it was stitched with a 5-0 absorbable suture using the sling suturing technique around the teeth's neck (Figure 4). Following that, a partial-thickness flap was coronally advanced over the reversed periosteum and sutured using direct loop suturing on vertical incisions and sling suturing around the tooth's neck (Figure 5). No periodontal dressing was applied to achieve direct chemical plaque control by mouthrinse.



**Figure 2:** Two oblique vertical releasing incisions along line angle of uncovered root. Reflected partial-thickness flap showing uncovered root surface and bone.



**Figure 3:** Coronal reversal of crestly pedicle periosteum over the uncovered root surface.



**Figure 4:** The reversed periosteum over the uncovered root surface was sutured.



**Figure 5:** The partial-thickness flap coronally advanced over the reversed periosteum and sutured.

Analgesic (Nimesulide 100 mg, 1 tablet every 12 hours, for 3 days) and antibiotics (Amoxicillin 500 mg, 1 tablet every 8 hours, for 7 days) were also prescribed. The patient was instructed to use an extra soft toothbrush to mechanically brush the treated area using a coronally directed "roll" technique. Additionally, mouth rinses containing 0.2% chlorhexidine were prescribed to be used twice a day for one minute for a duration of four weeks. Patient was advised to mechanical brushing of treated region using an extra soft toothbrush by coronally directed "roll" technique, and was prescribed to do mouth rinses with 0.2%.

In the first two weeks following surgery, once a week for the first two weeks following surgery, and once a month for the next twelve months, the patient was summoned back for clinical follow-up.

### Results

The healing process went smoothly. The patient was happy with how the procedure turned out. Complete epithelialization of the reversed periosteum was seen 1 week after surgery. After 1 year, 95% root coverage for #11 and #21 i.e. 4.8 mm and 4.5 mm respectively, and 1.5 mm and 1.8 mm respectively probing depth were obtained (Figure 6).



**Figure 6:** One year postoperative showing complete root coverage.

### Discussion

Reattaching collagen fibers to the root surface is the most important step in regenerative periodontal therapy. Nonetheless, the reattachment of collagen fibers to the root surface must occur before bone regeneration can occur. The periosteum's natural structure consists of an inner layer of osteoblasts, osteoblast progenitor cells, and stem cells next to bone and an outside layer of dense collagen fibers, fibroblasts, and stem cells next to soft connective tissue [6]. Studies reveal that when placed on dentin, cells from the outer layer of the periosteum can create cementum with integrated collagen fibers [7]. In the periosteum reversal technique, the exposed root surface is covered by cells from the outer layer of the periosteum that are capable of producing cementum and periodontal ligament. In this way, cells from the periosteum's outer layer are the first to colonize the exposed root surface. Therefore, throughout the healing process, the exposed root surface contains the cells that have the capacity to rebuild the periodontal ligament and cementum. The cells of inner layer of periosteum, which have ability to form bone, are immediately behind the cells of outer layer of periosteum. Thus, after formation of cementum and periodontal ligament, they form bone. Because of this, the periosteum reversal approach positions the right cells in the right spots to promote the regeneration of the exposed root surface.

In the periosteum reversal procedure, the basal portion of the periosteum is employed for reversal on denuded root surface for root covering after the periosteum is detached from the mucoperiosteal flap following baseline incision. Without retraction forces, the periosteum can be extended and coronally transferred across the denuded root surface while remaining anchored in the crestal portion.

of the mucoperiosteal flap [5]. Thus, after reversal on denuded root surface, outer layer of the periosteum come in direct contact with root surface. Therefore, placement of the periosteum on root surface is same in both techniques.

In both techniques, the periosteum retains its attachment. In the periosteum reversal technique, the periosteum remains pedicle in the crestal part of mucoperiosteal flap whereas in the periosteum reversal technique, it is pedicle at the crestal/marginal part of the alveolar bone. As a result, the periosteum maintains its blood supply and can endure on an avascular root surface or even after surgery, when it becomes exposed. The periosteum can be sutured securely onto the exposed or denuded root surface because it is linked to either the bone or the mucoperiosteal flap.

Patients and different parts of the mouth have different periosteum dimensions and thickness. Understanding and taking into account the vital structures beneath the periosteum is crucial during surgery. However, with the right knowledge and expertise, accessing the periosteum and obtaining the graft can be done efficiently and swiftly. With this surgical technique, the physician can carry out regenerative surgery on every surface of every tooth in a quadrant or mouth quickly and effectively [9].

This technique's benefit over free periosteum is that the vascularized periosteum is superior. Compared to free periosteum, the recipient site's environment has less of an impact on the osteogenic potential of vascularized periosteum. An additional benefit is the ability to modify the transferred periosteum's configuration to conform to the recipient site's geometry [10]. The only disadvantage is the chances of tear/perforation during the preparation of partial-thickness flap. This problem can be overcome by careful and gentle handling of soft tissue during the preparation of partial-thickness flap.

### Conclusion

The uncovered root surface of receding gums is a serious concern for functionally, structurally and esthetically. The surgical technique of choice for coverage of uncovered root surface of receding gums depends on several factors, each technique having its own indication, contraindication, advantage and disadvantage. The periodontist should choose least traumatic surgical technique among them with best esthetic result. The result of the periosteal reversal technique for coverage of uncovered root surface of receding gums was predictable. However, it is technique sensitive especially in those cases with thin periodontal biotype. More work in future with use of the periosteal reversal technique for coverage of uncovered root surface of receding gums is anticipated.

### Bibliography

1. Dixit J, et al. "Treatment of receding gums by three different surgical techniques: A comparative clinical study". *Journal of Indian Society of Periodontology* 10 (2006): 194-200.
2. Singh AK and Gautam A. "Platelet-rich fibrin-reinforced periosteal pedicle graft with vestibular incision subperiosteal tunnel access technique for the coverage of uncovered root surface". *Journal of Interdisciplinary Dentistry* 6.1 (2016): 33-38.
3. O'Leary TJ, et al. "The plaque control record". *Journal of Periodontology* 43.1 (1972): 38-42.
4. Ainamo J and Bay I. "Problems and proposals for recording gingivitis and plaque". *International Dental Journal* 25.4 (1975): 229-235.
5. Singh AK and Kiran P. "The periosteum reversal technique for coverage of denuded root surface". *Journal of Indian Society of Periodontology* 19.4 (2015): 458-461.
6. Youn I, et al. "Differential phenotypic characteristics of heterogeneous cell population in the rabbit periosteum". *Acta Orthopaedica* 76.3 (2005): 442-450.

7. Groeneveld MC., *et al.* "Formation of a fibrillar acellular cementum-like layers induced by alkaline phosphatase activity from periodontal ligament explants maintained *in vitro*". *Journal of Dental Research* 73.10 (1994): 1588-1592.
8. Simon TM., *et al.* "Cambium cell stimulation from surgical release of the periosteum". *Journal of Orthopaedic Research* 21.3 (2003): 470-480.
9. Steiner GG., *et al.* "The reversed periosteal graft". *Compendium of Continuing Education in Dentistry* 28.3 (2007): 154-161.
10. Singh AK and Saxena A. "Treatment of periradicular bone defect by periosteal pedicle graft as a barrier membrane and demineralized freeze-dried bone allograft". *Journal of Clinical and Diagnostic Research* 11.1 (2017): 12-14.

**Volume 23 Issue 5 May 2024**

**©All rights reserved by Garima Singh and Sudhanshu Agrawal., *et al.***