



**The Management of Gingival Recession Associated With Orthodontic Therapy: Case Report**

Deval Trivedi, Senior Lecturer, College of Dental Sciences & Research Centre

Sejal Mehta, Post Graduate, College of Dental Sciences & Research Centre

Ganesh Nair, Post Graduate, College of Dental Sciences & Research Centre

Rahul Shah, Senior Lecturer, College of Dental Sciences & Research Centre

Anita Panchal, Professor and Head, College of Dental Sciences & Research Centre

**Correspondence Author:** Deval Trivedi, Senior Lecturer, Department of Periodontology and Implantology, College of dental sciences & research centre, Ahmedabad-380058, Gujarat, India.

**Type of Publication:** Case Report

**Conflicts of Interest:** Nil

**Abstract**

Many patients undergo orthodontic treatment for aesthetic improvement. The patients who undergo orthodontic treatment have a high susceptibility of plaque accumulation on their teeth because of the presence of brackets, wires and/or other orthodontic elements on the teeth surfaces with which the oral hygiene procedures might be more difficult. There is a strong correlation between the severity and extent of gingival recessions and the orthodontic treatment suggesting that orthodontic tooth movement may lead to gingival recession. The principal objective in the treatment of gingival recession is to cover the exposed root surfaces to improve aesthetics and to reduce hypersensitivity. Different soft tissue grafting procedures have been proposed in the treatment of gingival recessions. Free gingival graft is a reliable method for treatment of gingival recession. The purpose of this case report was to illustrate the relationship between orthodontic therapy and gingival recession.

**Keywords:** Aesthetics, Free gingival graft, Dentinal hypersensitivity, Periodontal health, Root coverage.

**Introduction**

Mucogingival therapy is a general term used to describe periodontal treatment involving procedures for correction

of defects in morphology, position, and/or amount of soft tissue and underlying bone support at teeth and implants (Glossary of Terms in Periodontology 2001). In this group of periodontal treatment modalities. In 1993 Miller proposed the term periodontal plastic surgery, considering that mucogingival surgery had moved beyond the traditional treatment of problems associated with the amount of gingivae and recession type defects to also include correction of ridge form and soft tissue esthetics. Periodontal plastic surgery would accordingly be defined as “surgical procedures performed to prevent or correct anatomic, developmental, traumatic or disease-induced defects of the gingiva, alveolar mucosa or bone” (Proceedings of the World Workshop in Periodontics 1996). Among treatment procedures that may fall within this definition are various soft and hard tissue procedures aimed at:

**Case report:**

**A. Chief Complaint**

A 23 years old female patient was referred from the Department of Orthodontia to the Department of Periodontology, Implantology & Laser Dentistry, College of Dental Sciences & Research Centre, Ahmedabad for

the correction of the soft tissue in relation to lower anterior teeth.

### **B. History**

Patient was undergoing orthodontic treatment since last one and half year. She had undergone the extraction of 41 due to poor prognosis of that tooth. Patient's medical history was non-contributory.

### **C. Intraoral assessment**

Intraorally periodontal examination revealed no probing depth of more than 3mm in any location. The patient's oral hygiene status was judged to be good (OHI-S). There was no other periodontal concern other than Miller's class III recession of tooth 31 (Figure 1).

### **D. Radiographic assessment**

Radiographic examination showed no interdental bone loss.

### **E. Treatment**

Pre-surgical therapy included scaling, root planning and plaque control instruction. Four weeks of re-evaluation showed apico-coronary recession of 4mm (Figure 3), mesio-distally recession of 3mm (Figure 4). Accordingly after the patient's consent, it was decided to treat the site by Miller's technique for free autogenous gingival grafting to achieve root coverage and simultaneously increase the attached gingiva.

### **F. Surgical Procedure**

#### **Preparation of the recipient site**

After adequate local anaesthesia had been achieved, the exposed root was planned thoroughly with a Gracey 1-2 curette. Recipient site was prepared by incising the mucogingival junction with 15 no. blade to the desired depth extending from 32 to 42. Periosteum was intact covering the underlying bone. Suturing of the flap is carried out with the help of resorbable (5-0 vicryl suture) at the apical portion where the free graft is to be placed. Three to four independent gut sutures are placed.

#### **Obtain the graft from the donor site**

The classic or conventional-free gingival graft technique consists of transferring a piece of keratinized gingiva of approximately the size of the recipient site. The palate is the usual site from which donor tissue is removed. The amount of donor tissue needed was accurately determined by using a foil template. The template was made by adapting it to the recipient site. The left side of palate was chosen by measuring the thickness of the tissue using a file with a stopper. The area between first and second premolar which had greater thickness was selected to harvest the donor tissue. The initial incision was outlined by the placement of tinfoil template with a no #15c scalpel blade. All palatal incision were made in such a fashion as to create the butt joint margin in the donor tissue.

This butt joint margin of the graft would be placed against the butt joint margin in the papilla and against the accentuated enamel margins at the cemento-enamel junction. A bevel access incision was made to get an even thickness of the graft. The incision was made along the occlusal aspect of the palate with no #15c scalpel blade held parallel to the tissue, continued apically, lifting and separating the graft. Tissue forceps was used to retract the graft distally as it was being separated apically and dissected, until the graft was totally freed. The graft obtained was inspected for any glandular or fatty tissue remnants. The thickness of the graft was also checked to ensure its smoothness and uniform thickness.

The graft was placed on the recipient bed and suture by means of interrupted sutures (4-0 Mersilk sutures) at the coronal and apical borders. An interrupted suturing technique was used for close adaption of the graft to the tooth surface.

The palatal wound was protected by a pack and it was stabilized by a Hawley's retainer.



Figure 1: Pre-operative

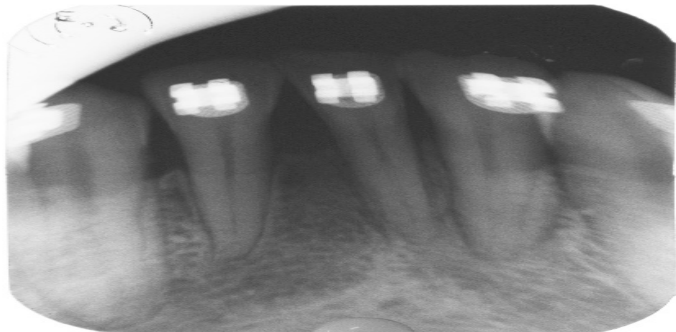


Figure 2: IOPA



Figure 3: Apico-coronally



Figure 4: Mesio-distal

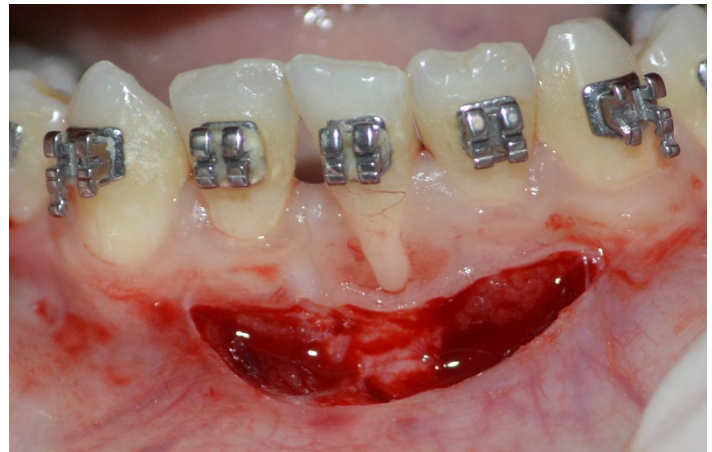


Figure 5: Incision



Figure 6: De-epithelisation



Figure 7: Template at the recipient site



Figure 8: Donor Site preparation

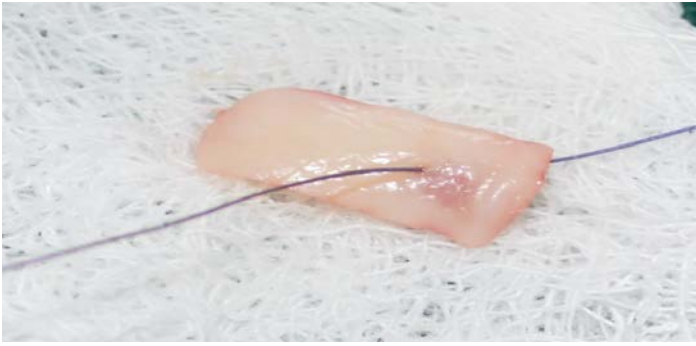


Figure 9: Graft

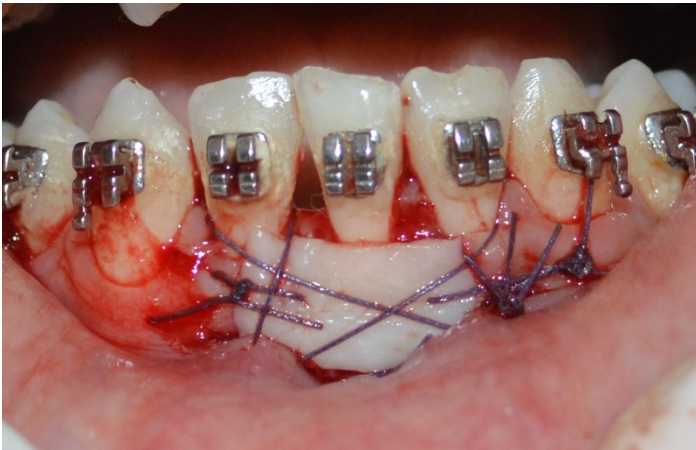


Figure 10: Sutures

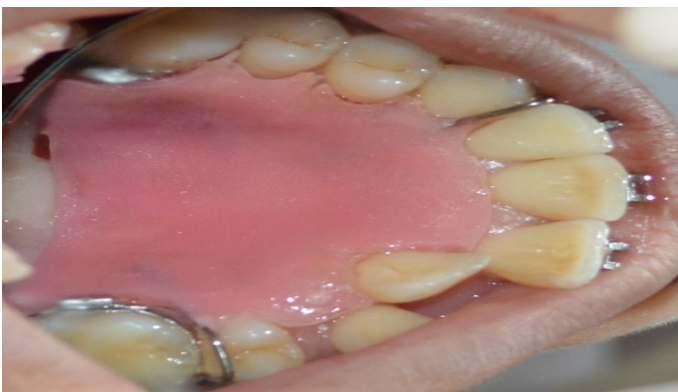


Figure 11: Hawley's Appliance



Figure 12: Periodontal Pack



Figure 13: Post-operative

### Discussion

This case report presented treatment approach for Miller's class-III recession of tooth no 31, was successful in complete root coverage by free autogenous soft tissue graft. Miller's criteria<sup>1</sup> for successful root coverage include: the soft tissue margin must be at the cemento-enamel junction, clinical attachment to the root, with sulcus depth of 2mm, and no bleeding on probing. Using these criteria for success, Miller<sup>2</sup> treated 100 cases of marginal tissue recession with root planning, saturated citric acid burnished into the root of 5 minutes and with free gingival graft. Root coverage of 100% was attained in the area of deep-wide recession and 100% in shallow-wide recession.<sup>2</sup> Holbrook and Ochsenbein<sup>3</sup>, also using the free soft tissue autograft as a one step surgical procedure on 50 documented teeth, reported recession of less than 3mm had 95.5% total root coverage, recession of 3-5mm had coverage of 80% and recession more than 5mm had 76% coverage.

Root coverage by placing free graft was first described by Sullivan and Atkins<sup>4</sup>, they reported that free gingival graft offers best results in cases of shallow and narrow recession. According to them when graft is placed over recession, some amount of "bridging" can be expected because a portion of grafted tissue which is covering the root will survive by receiving circulation from the vascular portion of the recipient site. In addition to

bridging, creeping attachment can result in a post-operative coronal migration of free gingival margin. Factors which favour creeping attachment are narrowness of the recession, the presence of bone positioned interproximally at a coronal level on the facial surface, absence of gross tooth mal-positioning, and adequate plaque control.

No procedure in periodontal surgery is more technically demanding or requires more attention to detail than free soft tissue grafting for root coverage. Many factors are interrelated that one cannot be singled out as “the most important factor”. Ignoring or failing to properly address a single factor can result in incomplete root coverage. Miller (1987)<sup>1</sup> has proposed many factors for incomplete or failure of root coverage. These include improper classification of marginal tissue recession, inadequate root planning, failure to treat the planed root with citric acid, improper preparation of recipient site, inadequate size of interdental papillae, improperly prepared donor tissue, inadequate graft size, in adequate graft thickness, dehydration of graft, inadequate adaptation of graft to root and remaining periosteal bed, failure to stabilize the graft, excess or prolonged pressure in captions of sutured graft, reduction of inflammation prior to grafting, trauma to graft during initial healing.

In various studies<sup>5,6</sup> comparing free gingival grafting with connective tissue graft, the mean percentage of root coverage is greater for connective tissue grafting than free gingival graft, since connective tissue graft is a bilaminar technique receiving dual blood supply from both the recipient bed and from the pedicle flap. The problem of graft necrosis over the denuded root surface is reduced when compared to free gingival graft. The subpedicle connective tissue graft is a delicate operative procedure that requires careful technical attention. For success, the connective tissue graft should be 1.5 to 2mm in thickness,

the interdental papillae should be retained as much as possible in the pedicle flap, the pedicle should be positioned correctly over the avascular root to be covered, and adequate follow up care and plaque control instruction should be given to allow healing in as plaque free environment as possible.

Free gingival grafting is a procedure of high degree of predictability when used alone or combined with other technique. However it is more technically demanding, time consuming, and the colour match of the tissue is often less than ideal. Due to the predictability and versatility of connective tissue graft, the use of the free gingival graft for root coverage has drastically declined. However its indication includes: increasing the depth of vestibule, increasing the amount of attached gingiva associated with restoration, augment the area of minimal gingival prior to orthodontic treatment.

The therapeutic goal in any form of corrective surgery must be clearly defined and judged against the result that can be obtained with other procedures. If stabilization of existing recession is the therapeutic objective and full coverage of the exposed root is not needed, then a simpler mucogingival procedure should be selected.

Result after 12 months of surgery have shown better root coverage than immediately after the surgery. This may be possible by the process known as creeping attachment. It is a postoperative migration of the gingival marginal tissue in a coronal direction, covering areas of previously denuded root surface.<sup>8</sup>

### **Conclusion**

The free soft tissue autograft when used for increasing the amount of attached gingiva is a relatively simple surgical procedure. The use of the free soft tissue autograft for root coverage, however, is a much more technically demanding procedure requiring the periodontist to consider additional

factors. Overlooking or failing to properly address a single one of these factors can result in incomplete coverage.

## **References**

1. Miller Jr P. Root coverage with the free gingival graft. Factors associated with incomplete coverage. *Journal of periodontology* 1987;58(10):674.
2. Miller Jr P. Root coverage using the free soft tissue autograft following citric acid application. III. A successful and predictable procedure in areas of deep-wide recession. *The International journal of periodontics & restorative dentistry* 1985;5(2):14.
3. Holbrook T, Ochsenbein C. Complete coverage of the denuded root surface with a one-stage gingival graft. *The International journal of periodontics & restorative dentistry* 1983;3(3):8.
4. Sullivan H, Atkins J. Free autogenous gingival grafts. 3. Utilization of grafts in the treatment of gingival recession. *Periodontics* 1968;6(4):152.
5. Borghetti A, Gardella J. Thick gingival autograft for the coverage of gingival recession: a clinical evaluation. *The International journal of periodontics & restorative dentistry* 1990;10(3):216.
6. Jahnke P, Sandifer J, Gher M, Gray J, Richardson A. Thick free gingival and connective tissue autografts for root coverage. *Journal of periodontology* 1993;64(4):315.
7. Koppolu Pradeep,<sup>1</sup> Palaparthi Rajababu,<sup>2</sup> Durvasula Satyanarayana,<sup>2</sup> and Vidya Sagar<sup>2</sup> Gingival Recession: Review and Strategies in Treatment of Recession: Volume 2012(2012), Article ID 563421:1.
8. L Trombelli, GP Schincaglia, C Scapoli, G Calura. healing response of human buccal gingival recessions treated with expanded polytetrafluoroethylene membranes. *Journal of Periodontology*. 1995;66:14–22.