

Management of Gingival Recession Associated with Orthodontic Treatment: A Case Report

TARUN KUMAR RANA¹, MEGHA PHOGAT², TARUN SHARMA³, NARAYANA PRASAD⁴, SHAILENDRA SINGH⁵

ABSTRACT

Many patients undergo orthodontic treatment for aesthetic improvement. It is well established that the patients who undergo orthodontic treatment have a high susceptibility to present 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. The orthodontic treatment is a double-action procedure regarding the periodontal tissues which may be very meaningful in increasing the periodontal health status and may be a harmful procedure which can be followed by several types of periodontal complications. 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. Subepithelial connective tissue 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 and to describe the management of this case.

Keywords: Aesthetics, Connective tissue graft, Dentinal hypersensitivity, Periodontal health, Root coverage

CASE REPORT

A 24-year-old girl was referred to the Department of Periodontics, Seema Dental College and Hospital Rishikesh, Uttarakhand, India for evaluation and treatment of the gingival recession associated with the mandibular left central incisor. The dental history revealed that she was undergoing orthodontic therapy in both arches since one year. The patient reported that she first noticed the gingival recession about five months ago and it was getting progressively worse and was sensitive to tooth-brushing. Her general health condition was good, did not take any medications, had no known allergies and was a nonsmoker. Clinical evaluation revealed Miller's Class II [1] gingival recession on the buccal surface of left central incisor extending 7mm apical to the CEJ [Table/Fig-1,2] and a narrow zone of attached gingiva measuring approximately 1mm. There was no loss of papilla height on the mesial and distal aspect of the central incisor. No plaque accumulation was detected in the affected site. There was no gingival recession associated with adjacent teeth. There was no bone loss on the mesial and distal aspects of the affected tooth. The aim of the treatment was to restore harmonious appearance of the gingiva by covering the root surface and to increase the zone of attached gingiva. It was decided to treat this problem with subepithelial connective tissue graft.

SURGICAL PROCEDURE

Preparation of the Recipient Site

Recipient site was prepared carefully with reflection of partial thickness flap. For this, two vertical incisions were given with the help of #15 blade, keeping in mind that recipient bed should be wide enough all around from the root surface [Table/Fig-3]. Root surface was prepared with scaling and root planning. After the preparation of recipient site, measurement was taken for donor tissue with the help of template made up of tin foil.

Graft Harvesting

Donor site was selected for graft harvesting. Graft was removed from right palatal vault, 10 mm away from the gingival margin and just medial to the first maxillary molar [Table/Fig-4]. Using a trap door approach, a template size sub-epithelial connective tissue graft was removed from the palate kept in moist gauze piece and inspected for the size and thickness. Excess connective tissue and fat was carefully removed with the help of castroviejo scissor to make it 1.5- 2.0mm thick. Graft was placed on the recipient site, stretched and stabilized with the help of horizontal suture (resorbable, vicryl, 5-0) [Table/Fig-5]. All the four corners of the graft were sutured to underlying recipient tissue. After stabilization of the graft, pressure was applied on the graft for at least five minutes for close adaptation



[Table/Fig-1]: Photograph showing 7 mm of recession



[Table/Fig-2]: Photograph showing 4 mm wide recession



[Table/Fig-3]: Preparation of recipient bed



[Table/Fig-4]: Harvesting graft from palate



[Table/Fig-5]: Showing recipient site with graft placement and coronal positioning of graft



[Table/Fig-6]: Sutures placement



[Table/Fig-7]: Placement of Coe pak



[Table/Fig-8]: Postoperative after 2 months



[Table/Fig-9]: Photograph showing 75% root coverage

of the graft tissue and removal of blood clot, which may be present in between the donor and recipient tissue, to increase the possibility of graft acceptance. Now the reflected flap of recipient tissue was coronally repositioned and sutured with recipient tissue with sling suture [Table/Fig-6]. Periodontal dressing was placed on the recipient site [Table/Fig-7]. After suturing, the donor site was covered with the retention plate appliance, which patient was using. Postoperative instructions were given to the patient and were instructed to avoid brushing at surgical site for at least two weeks; medications were prescribed along with povidone iodine mouthwash.

Clinical Observations

Followup on 10th day revealed signs of graft acceptance. From donor as well as recipient site sutures were removed; oral hygiene instructions were reinforced. After two months, examination showed that graft was completely accepted and recession was markedly covered with the graft tissue. Donor site was completely healed. Patient was put on three months of recall period and after 12 months of follow up, further coverage of recession was noted by the probable process of creeping attachment [Table/Fig-8,9].

DISCUSSION

The aetiology of gingival recession is multi factorial like excessive or inadequate teeth brushing, destructive periodontal disease, tooth malpositioning, alveolar bone dehiscence, thin and delicate marginal tissue root surface, high muscle attachment and frenal pull, occlusal trauma and other iatrogenic factors [2]. Among these aetiological factors, a strong correlation was found between the severity and extent of gingival recession to past or undergoing orthodontic treatment which can be associated with dentine hypersensitivity, root caries and/or cervical wear [3]. Experimental evidence suggests that orthodontic tooth movement does not actually cause gingival recession but might create an environment that predisposes to this condition particularly if teeth are repositioned in a facial direction [4]. Coverage of denuded roots has become one of the most challenging procedures in periodontal mucogingival

surgery. The success of surgical procedures for root coverage depends on several factors, such as the aetiology of gingival recession, evaluation of the interproximal bone level and region to be treated [5]. Various surgical options have been developed to achieve the above goals and include the use of free gingival grafts, laterally sliding flaps, coronally advanced flaps, double papilla flaps, guided tissue regeneration, and acellular dermal matrix allografts. The disadvantages of these techniques have led to development of subepithelial connective tissue grafts (SECTG) procedure [6]. The SECTG have been highly predictable in gingival recession therapy with respect to a high percentage of root coverage, better healing, color match and less postoperative discomfort at the donor site, when compared to free gingival grafts [1].

The connective tissue graft was first used by Edel to increase the width of keratinized gingiva [7]. Subsequently the connective tissue graft has been used for augmenting ridge deficiencies, furcation involvement, reconstruction of collapsed interdental papillae and peri implant tissue management [8,9]. The use of connective tissue graft for gingival recession therapy was first reported by Langer and Langer [10] for both single and multiple adjacent teeth and modified by Harris (1992), Allen (1994) and Bruno (1999). The advantages of connective tissue graft is the good color match with neighboring soft tissues, less invasive palatal wound as well as long-term results in terms of root coverage. It combines the advantages of the pedicle flap procedure and guarantees a double blood supply from both the overlying pedicle flap and the underlying periosteum. In addition, in class II recession, the dimension of the recession also plays an important role in degree of root coverage. Less favorable treatment outcome has been reported at sites with wide (> 3mm) and deep (>5 mm) recession [11,12].

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 [13].

CONCLUSION

This case report describes the management of gingival recession caused by tooth movements during orthodontic therapy. The surgical treatment using SCTG has proven to be a gold standard with highly predictable outcome for root coverage and excellent color match.

REFERENCES

- [1] Langer L, Langer B. The subepithelial connective tissue graft for treatment of gingival recession. *Dent Clin North Am.* 1993;37:243-63.
- [2] Wennstrom JL, PiniPrato GP Mucogingival therapy periodontal plastic surgery. In: Clinical Periodontology and implant dentistry. J Lindhe, N P Lang, T Karring, Eds; 4th Edn.; Blackwell Publication, Munksgaard, 2003;576-649.
- [3] Wennström JL Mucogingival therapy. *Annals Periodontology.* 1996;1: 671-701.
- [4] Wennström JL, Lindhe J, Sinclair F, Thilander B Some periodontal tissue response to orthodontic tooth movement in monkeys. *Journal of Clinical Periodontology.* 1987;14:121-29.
- [5] Greenwell H, Bissada NF, Henderson RD, Dodge RJ The deceptive nature of root coverage results. *Journal of Periodontology.* 2000; 71:1327-37.
- [6] Rosetti EP, Marcantonio RAC, Rossa C, et al Treatment of gingival recession: comparative study between subepithelial connective tissue graft and guided tissue regeneration. *J Periodontol.* 2000;71;1441-47.
- [7] Miller PD. A classification of marginal tissue recession. *Int J Perio Rest Dent.* 1985; 5:9-13.
- [8] Greenwell H, Fiorellini J, Giannobile W, Offenbacher S, Salkin L, Townsend ; Research, Science and Therapy Committee. Oral reconstructive and corrective considerations in periodontal therapy. *J Periodontol.* 2005;76:15:88-600.
- [9] Edel A Clinical evaluation of free connective tissue grafts used to increase the width of keratinized gingiva. *J Clin Periodontol.* 1974;1:185-96.
- [10] Langer B, Langer L. Subepithelial connective tissue graft. A new approach to the enhancement of anterior cosmetics. *Int J Perio Rest Dent.* 1982;2:23-33.
- [11] Azzi R, Etienne D, Carranza F, Surgical reconstruction of the interdental papilla. *Int J Perio Rest Dent.* 1998;18:467-73.
- [12] PriniPrato GP, Tinti C, Vincenzi G, Magnani C, Cortellini P, Clauser C: Guided tissue regeneration versus mucogingival surgery in the treatment of human buccal gingival recession. *Journal of Periodontology.* 1992;63:919-28.
- [13] Trombelli L, Schincaglia GP, Scapoli C, Calura G: healing response of human buccal gingival recessions treated with expanded polytetrafluoroethylene membranes. *Journal of Periodontology,* 1995; 66: 14-22.

PARTICULARS OF CONTRIBUTORS:

1. Senior Lecturer, Department of Orthodontics, Seema Dental College & Hospital, Rishikesh, Uttarakhand, India.
2. Senior Lecturer, Department of Periodontics, Seema Dental College & Hospital, Rishikesh, Uttarakhand, India.
3. Reader, Department of Orthodontics, Seema Dental College & Hospital, Rishikesh, Uttarakhand, India.
4. Professor and Head, Department of Orthodontics, Seema Dental College & Hospital, Rishikesh, Uttarakhand, India.
5. Senior Lecturer, Department of Orthodontics Vanachal Dental College, Garwa, Jharkhand, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Megha Phogat,
Flat No. 3, Teaching Staff Quarter, Seema Dental College and Hospital, Rishikesh, Uttarakhand-249203, India.
Phone: 8057224355 E-mail: megha.phogat@gmail.com

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Apr 27, 2014**
Date of Peer Review: **May 12, 2014**
Date of Acceptance: **May 19, 2014**
Date of Publishing: **Jul 20, 2014**