Case Report

International Journal of Dental and Health Sciences
Volume 02, Issue 05

CITRIC ACID ROOT BIOMODIFICATION IN RECESSION COVERAGE WITH LATERAL PEDICLE FLAP TECHNIQUE- A CASE REPORT

Mamta Singh[1], Disha Gupta[2], Rajesh Kumar Thakur[3], Manvi Agarwal[4]

1.Post graduate student, Department of Periodontics, Kothiwal Dental College and Research Centre, Moradabad
2.Post graduate student, Department of Periodontics, Kothiwal Dental College and Research Centre, Moradabad
3.Professor, Department of Periodontics, Kothiwal Dental College and Research Centre,Moradabad
4.Reader, Department of Periodontics, Kothiwal Dental College and Research Centre,Moradabad

ABSTRACT:

Esthetics is of prime concern to our modern society. Compromised oro-dental esthetics pulls the patient to the dental office. Gingival recession is the displacement of the gingival margin apical to the cemento-enamel junction (CEJ). The etiology is varied for e.g. inflammatory periodontal disease, developmental anatomic abnormalities (aberrant frenal attachment, thin bony plate), toothbrush injury, tooth malposition and iatrogenic factors. Besides compromised esthetics, gingival recession also results in a variety of other problems such as root hypersensitivity, a higher incidence of root caries and diminished plaque control, thus necessitating treatment. Various surgical techniques have been attempted to correct gingival recession; lateral pedicle flap technique is one of them. This paper presents a case of Miller's Class II gingival recession which was successfully managed with lateral pedicle flap technique after root biomodification with citric acid. Citric acid enhances new attachment by exposure of root collagen and opening of dentinal tubules due to removal of smear layer. This technique has esthetically and clinically acceptable results.

Key Words: Gingival recession, lateral pedicle flap, root biomodification, dentinal tubules, smear layer.

INTRODUCTION:

Gingival recession is defined as the apical shift of the gingival margin from the cemento-enamel junction thus exposing the root surface to the oral environment. [1-2]The primary causes of gingival recession are:

- Accumulation of bacterial plaque (Baker and Seymour 1976) [3]
- Trauma from toothbrushing (Gorman 1967) [4]
- Unfavourable anatomy such as high frenum insertion, shallow buccal fold that produce tension on the marginal gingival (Parfitt and Mjor 1964) [5]
- Iatrogenic factors such as Amalgam or prosthetic overhang, orthodontic appliances (Gorman[2] 1967, Lindhe [6] et al. 1987)
- Tooth malpositioning (Parfitt and Mjor 1964) [5]
- Aging

*Corresponding Author Address: Dr Mamta Singh.Email: singh.mamtanbd@gmail.com

A variety of mucogingival surgeries have been suggested for root coverage. The Lateral Pedicle Flap procedure was first introduced by Grupe in 1956 [7], and various authors suggested several modifications in order to reduce the risk of gingival recession and bone dehiscence at the donor site. The advantages of this technique include better esthetics with greater amount of keratinized gingiva, better blood supply, and more coverage for Miller Class I and II recession defects (34%-100%).[8]

CASE DETAIL:

A male patient of age 50 years was referred from the Department of Oral Medicine to the Department of Periodontics with the chief complaint of receding gums in lower front tooth. There was localized Miller's Class II gingival recession in #31 [Figures 1 and 2]. The corono-apical length of recession was about 7 mm and the mesio-distal width of recession was 2 mm.

Figure 1: Preoperative 7 mm recession length

Figure 2: Preoperative mesio-distal width

The occlusal discrepancies were corrected, as it contributed to the etiology of recession in this case and so slight incisal grinding was done. Intra-oral Periapical Radiograph [Figure 3] in relation to the #31 revealed adequate interdental bone support.

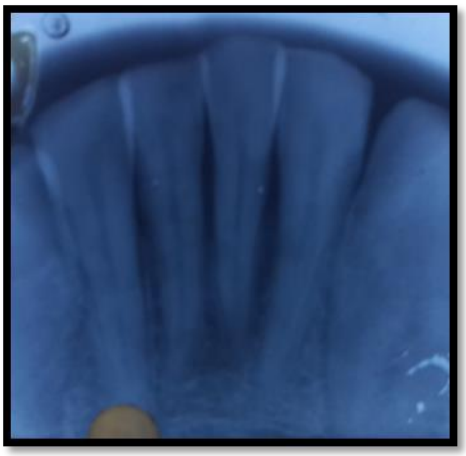

Figure 3: Radiograph

The patient was medically sound and fit, so a surgical procedure was planned. Scaling and root planing was done prior to surgery [Figure 4].

Figure 4: 1 week post scaling and root planning

SURGICAL TECHNIQUE

After local anesthesia (2% lignocaine hydrochloride with 1:80,000 epinephrine), root conditioning was done with Citric Acid ph 1.0 for 2-3 min on the exposed root surface of #31 to allow biological attachment of the grafted tissue to it.[9] [Figure 5]

Figure 5: Root biomodification with Citric Acid ph 1.0 for 3 min

Thereafter recipient bed was prepared by giving V- shaped incisions around the exposed root with no.15 Bard Parker blade. An external bevel incision was given on the opposite side of the donor area and an internal bevel incision on the same side of the donor area to permit overlap of flap. [Figure 6]

Figure 6: Preparation of Recipient Bed

The adjacent partial-thickness pedicle flap from #32 [Figure 7] was reflected, leaving about 3 mm of marginal gingiva intact (1mm sulcus and 2mm for biological width), of a width more than 1½ times the area of gingival recession.

Figure 7: Submarginal incision 3mm from marginal gingiva at the donor site #32

The adjacent partial thickness flap was then reflected from the donor site #32 and kept over the recipient site #31 [Figure 8] and finger pressure was applied with a gauze piece until the graft was firmly seated.

Figure 8: Pedicle flap placed on the recipient site #31

It was then carefully secured with independent sling and holding sutures without tension [Figure 9] followed by placement of tin foil on the raw donor site [Figure 10].

Figure 9: Sutures placed

Figure 10: Tin foil placed

Good adaptation of the flap to the underlying tissues is essential for establishment of a thin clot which facilitates proper adaptation as well maintanance of knife edged gingival margin. Periodontal dressing was given after surgery [Figure 11].

Figure 11: Coe pack placed

The patient was discharged with postoperative instructions and medications for 5 days to avoid postoperative pain and swelling. Patient was prescribed Amoxicillin 500mg thrice daily for 5 days and Aceclofenac 100mg tablets twice daily for 5 days. Besides he was also advised 0.2% Chlorhexidine gluconate mouthwash for oral rinse. The patient was recalled after 10 days for check-up. [Figure-12]

Figure 12: 1 week Post operatively

The surgical site was examined for uneventful healing. There was no postoperative complication and healing was satisfactory. The defect created at the donor site healed by secondary intention. The patient was instructed to use soft toothbrush for mechanical plaque control in surgical area. The patient was monitored on weekly schedule postoperatively [Figure 13], to ensure good oral hygiene in the surgical area.

Figure 13: 3 weeks post operatively

DISCUSSION:

Gingival recession might occur asymptomatically but may alarm the patient due to poor esthetics, dentine hypersensitivity, inability to perform oral hygiene procedures, and loss of the tooth. There are currently different techniques for root coverage, but it is often difficult to anticipate the success rate of root coverage procedures since coverage depends on several factors, including the classification and location of the recession and the technique used.

Citric acid (ph 1.0) for 2-5 min has been widely used for root conditioning. It has been shown that citric acid demineralization enhances new attachment/ reattachment and regeneration by one of the following mechanisms:

- Antibacterial effect
- Root detoxification
- Exposure of root collagen and opening of dentinal tubules
- Removal of smear layer
- Initial clot stabilization
- Demineralisation prior to cementogenesis.
- Enhanced fibroblast growth and stability.
- Attachment by direct linkage with or without cementogenesis.
- Prevention of epithelial migration along denuded roots.
- Accelerated healing and new cementum formation after surgical detachment of the gingival tissues and demineralization of the root surface by means of citric acid.

In this case report a lateral pedicle flap technique was used after root biomodification with Citric Acid for successful root coverage. Indication of this technique is to repair an isolated area of gingival recession when there is sufficient width, length, and thickness of keratinized tissue adjacent to the area of gingival recession.[10] It is well stated that a better root coverage outcomes were only achieved in cases with adequate height and width of keratinized tissue.[11] It is recommended in class I and II shallow recessions according to Miller. Contraindications include if the donor site lacks sufficient attached gingiva or if the

donor site has a fenestration or dehiscence. In this, the flap remains attached at their base so that they retain their own blood supply during their transfer to a new location. Blood supply after this procedure is maintained from the areas bordering the recession defect and from the pedicle. To preserve the integrity of marginal gingiva at the donor site, sub marginal incision was performed. Stability and dimension of the laterally positioned flap (the wider the pedicle, the greater the blood supply to the marginal portion of the flap) are critical for accomplishing root coverage. The tissue thickness of the flap is an important aspect on the root coverage predictability and an improvement in esthetic outcome.[12] Precise determination of the location of the CEJ and mucogingival junction prior to surgery and precise placement of incisions are necessary in order to achieve optimum esthetics.[13] Studies have shown that with a rigid case selection the laterally positioned flap is an effective method in treating isolated gingival recession.[14] The advantages of pedicle graft are that predictable correction of gingival recession is possible as the graft has an uninterrupted blood supply, and that postoperative discomfort is usually minor because no second surgery or another surgical site is involved. Also the color of the graft matches the adjacent gingiva; this technique provides good esthetics. The disadvantages of this method are possible bone loss and gingival recession at the donor site.[15]

CONCLUSION:

Esthetic surgery is performed to reshape normal structures in order to improve the patient's appearance. Careful preoperative diagnosis and appropriate case selection are prerequisites for surgical success. This is a case report that presents a technique for treatment of isolated recession defect in the lower anterior region. This technique was easier with fewer complications that can be used for successful management of recession. The advantages of this technique are reduced hypersensitivity, esthetic color matching, good blood supply to the reflected flap with high percentage of root coverage. The patient was highly satisfied with the treatment outcome.

REFERENCES:

1. The American Academy of Periodontology. Glossary of periodontal terms, 4th edition. Chicago IL: The AmericanAcademy of Periodontology 200: 44.
2. Deby Johnson. Perio Plastic Surgery. 2012. Garant, Stern, Listgarten. Periodontics. 6th ed. Mosby; 1988.
3. Baker D, Seymour G. The possible pathogenesis of gingival recession. A histological study of induced recession in the rat. J Clin Periodontol 1976; 3: 208-219.
4. Gorman WJ. Prevalance and etiology of gingival recessions. J Periodontol 1967; 38: 318-322.
5. Parfitt GJ, Mjor A. A clinical evaluation of local gingival

recession in children. J Dent Children 1964; 31, 257-262.
6. Lindhe J, Socransky SS, Nyman S, Westfelt E. Dimensional alteration of the periodontal tissues following therapy. Int J Periodont Rest Dentistry 1987; 2: 9-22.
7. Grupe J, Warren R. Repair of gingival defects by a sliding flap operation. J Periodontol 1956; 27: 290-5.
8. Smukler, H. Laterally positioned mucoperiosteal pedicle grafts in the treatment of denuded roots. J Periodontol, 1976; 47: 590-595.
9. Miller Jr PD. A classification of marginal tissue recession. Int J Periodontol Rest Dent 1985; 18: 444-53.
10. Guinard EA, Caffese RG. Treatment of localized gingival recession part-I lateral sliding flap. J Periodontol 1978; 49: 351-6.
11. Verma PK, Srivastava R, Chaturvedi TP, Gupta KK. Root coverage with Bridge Flap-Case Reports. J Indian Soc Periodontol 2013; 17: 120-3.
12. Kerner S, Sarfati A, Katsahian S, Jaumet V, Micheau C, Mora F, et al. Qualitative cosmetic evaluation after root-coverage procedures. J Periodontol 2009; 80: 41-7.
13. Maynard JG Jr, Wilson RD. Physiological dimensions of the periodontium significant to the restorative dentist. J Periodontol 1979; 50; 170-7.
14. Jagannathachary S, Prakash S. Coronally positioned flap with or without acellular dermal matrix graft in the treatment of class II gingival recession defects: A randomized controlled clinical study. Contemp Clin Dent 2010; 1: 73-8.
15. Zucchelli G, Cesari C, Amore C, Montebugnoli L, De Sanctis M. Laterally moved coronally advanced flap: A modified surgical approach for isolated recession type defects. J Periodontol 2004; 75: 1734-41.