Case Report

International Journal of Dental and Health Sciences
Volume 02, Issue 04

THE AESTHETIC CHALLENGES OF A LATERALLY POSITIONED FLAP IN MILLER'S CLASS III RECESSION: A CASE SERIES

Gulnar Dara Sethna[1], Rajesh Prabhakar Gaikwad[2], Akshaya Bhupesh Banodkar[3], Nilofar Badshah Attar [4]

1.Assistant Professor,Department of Periodontology, Government Dental College and Hospital, Mumbai, India.
2.Associate Professor,Department of Periodontology, Government Dental College and Hospital, Mumbai, India.
3.Assistant Professor,Department of Periodontology, Government Dental College and Hospital, Mumbai, India.
4.Assistant Professor,Department of Periodontology, Government Dental College and Hospital, Mumbai, India.

ABSTRACT:

Purpose: Gingival recession is a common and undesirable clinical condition that causes diminished aesthetic appeal, hypersensitivity, and predisposition to root caries. A Lateral positioned flap (LPF) is a pedicled flap used for treatment of isolated gingival recession in cases where the gingival biotype is thick and there is sufficient amount of keratinised tissue adjacent to the recession defect.

Methods: Three patients with Miller's class III gingival recession were selected and LPF was performed for each case. Each patient was evaluated for gingival recession depth (GRD) and Clinical Attachment Level (CAL) at the baseline and the final appointment at 12 months.

Results: The three cases of Miller's class III gingival recession had a mean GRD of 7 ±1.5mm and a mean residual GRD of 1.5 ±1 mm at the baseline and the final appointment respectively, after the root coverage surgery. There was significant reduction of symptom of hypersensitivity in all the three cases and the patients were aesthetically satisfied with the clinical outcomes.

Conclusion: The LPF as a surgical procedure for root coverage achieved satisfactory outcomes both aesthetically and functionally in patients with advanced gingival recession.

Key Words: Case report; gingival recession depth; Clinical attachment level; Lateral pedicle flap; root coverage

INTRODUCTION:

The American Academy of Periodontology has defined marginal tissue recession as an acquired deformity with the gingival margin being located apical to the Cemento-enamel junction (CEJ), resulting in exposed root surface and loss of attached gingiva.[1] Aetiology of gingival recession is multi-factorial, mainly attributed to periodontal disease[2,3] occlusal trauma,[4]excessive mechanical forces while brushing [5] and anatomical factors like width of keratinized

*Corresponding Author Address: Dr.Gulnar Sethna. Email: gulnar110@yahoo.co.in

gingiva.[6] The necessity of a band of attached gingiva for maintenance of optimal periodontal health is controversial in the literature, it is commonly accepted that areas with less than 2 mm of attached gingiva are at a higher risk for recession.[7] While Lang and Löe [6] suggested that 2 mm of gingiva is an essential precondition for periodontal health [8] , Miyasato et al demonstrated that clinically healthy gingiva can exist in areas with minimal or no attached gingiva with proper oral hygiene and absence of bacterial plaque.[9] Even though it is possible for gingival health to exist in areas of minimum or no attached gingiva, it is commonly accepted that areas with less than 2 mm of attached gingiva are at a higher risk for recession.[7]

Indications for root coverage include gingival recession, aesthetic demand, sensitivity, and preparatory to prosthetic or orthodontic treatment. [2] Defects classified as Miller's class I and II can result in full coverage of the recession defect whereas Miller's class III gingival recession would only provide partial coverage to the level of the interdental bone. Class IV defects are unlikely to provide any root coverage as a result of surgical intervention and therefore any periodontal plastic surgery should be avoided.[10]

There are three main types of periodontal plastic surgery procedures described in the literature to treat recession defects. These include pedicle flaps, free soft tissue grafts, and guided tissue regeneration.[11]

A pedicle graft involves repositioning donor tissue from an area adjacent to the recession defect to cover the exposed root surface. Grupe and Warren [12] first described the pedicle flap as a laterally repositioned full thickness flap. The purpose was to gain attached gingiva and to cover areas of gingival recession, especially those on the facial surfaces of mandibular anterior teeth. The lateral positioned flap can be used to cover the isolated, denuded roots that have adequate donor tissue laterally and vestibular depth.

CASE DETAIL:

CASE 1

History: A female patient of age 28years, reported to the Department of Periodontics, Government Dental College and hospital, Mumbai with a chief complaint of receding gums and mild sensitivity in mandibular right central incisor. The recession was localized and Class III according to Miller's classification in tooth # 41 with insufficient width of the keratinized gingiva (Fig.1). Gingival recession depth (GRD) (i.e. distance from CEJ to zenith of marginal gingiva) on tooth # 41 was of 6.5mm (Fig. 2) and width of gingival recession (Distance between mesial and distal gingival margin level at the CEJ) was 3mm (Fig. 3).There was adequate keratinized gingiva on the donor site,

tooth # 42. I.O.P.A radiograph in relation to the tooth # 41 revealed significant interdental bone loss (Fig.4).

Pre surgical protocol

Scaling and root planing was done four weeks prior to the surgery. An informed consent form was explained and signed by the patient. Patient was motivated and educated, and oral hygiene instructions were given before scheduling the patient for periodontal surgery.

Surgical technique: After local anaesthesia, 15-C blade was used to make a V-shaped incision to remove the marginal epithelium surrounding tooth # 41 around the area of gingival recession (Fig.5). A vertical incision was prepared at the distal line angle area at least $1^{1/2}$ teeth away from recipient site (Fig.6).The vertical incision was extended beyond the muco-gingival junction into the alveolar lining mucosa. A split-thickness pedicle flap was then raised and rotated over the exposed root surface on the opposite side (Fig.7). Sulcular incision extending from the V shaped incision to the vertical incision was made using no.15 C blade. The convexity of the root was slightly reduced with an aerotor hand piece (Fig.8); root conditioning with tetracycline solution (125 mg/mL) was done for three minutes (Fig.9). The flap was sharply dissected so as to preserve all the interproximal papilla. To ensure that the graft tissue was free from any tension, a relieving incision (cut-back incision) was extended further apically. Gentle finger pressure was applied on the flap with a moist gauze piece to ensure good union between donor and recipient tissues and for good vascularisation of the grafted tissue. The pedicle flap was sutured 1-2 mm coronal to the CEJ with 4-0 resorbable interrupted sutures without tension (Fig.10). The donor site was left to heal by secondary intention; however a thin aluminium foil was placed on the exposed donor area (Fig.11) and a light cure periodontal dressing (Barricaid) was placed on the surgical site (Fig.12).

Post-Operative Instructions:Analgesics and antibiotics were prescribed to the patient and were asked to discontinue the tooth brushing around the surgical site during the initial fifteen days after surgery. During this period, plaque control was achieved with a 0.2% chlorhexidine mouth rinse used twice a day. Sutures were removed after ten days and oral hygiene instructions were reinforced in the maintenance programme.

Results and outcome: Healing was uneventful as seen at the time of suture removal and in the third and the sixth month post-operative visits. There was 84.61% root coverage as seen at the third month and 12 – month post-operative visit (Table 1). A gain of CAL of 5mm was seen at the sixth month post-operative visit

(Fig.13) which was maintained throughout the one year recall period (Fig.14,15).Patient was satisfied with the outcome of root coverage and there was significant improvement in the symptoms of hypersensitivity

CASE 2

History: A male patient of age 40 years, reported to the Department of Periodontology, Government Dental College and hospital, Mumbai with a chief complaint of an "elongated" mandibular right central incisor. He had previously undergone full mouth flap surgery and composite splinting of lower anterior teeth one year back in another private clinic but was most concerned about his lower right lateral incisor. On examination, tooth #41 had Miller's Class III recession with loss of CAL of 12mm, GRD of 10 mm (Fig.16) width of gingival recession of 3.5-4mm (Fig.17). The tooth was vital as determined by a cold test and on clinical evaluation; there was no bleeding on probing seen in the designated surgical site. There was adequate keratinized gingiva on the donor site of tooth #42. Patient was informed about the questionable prognosis of tooth #41 due to severe periodontal attachment loss. Further, complete root coverage could not be expected due to significant interproximal bone loss.

Surgical procedure and outcome: The procedure was similar as in case 1. A gain of CAL of 5 mm and partial root coverage (70%) was seen one month after suture removal and the results were maintained throughout the one year post-operative visit (Fig.18).

CASE 3

A 35 year old female patient complained of sensitivity and unacceptable aesthetics on mandibular right central incisor (tooth # 41) and the recession was diagnosed as Miller's class III.After scaling and root planing, patient was evaluated after four weeks. Loss of CAL and GRD on tooth # 41was 9 mm and 7 mm respectively (Fig. 19).The procedure was similar to case 1, healing was uneventful and the defect created at the donor site healed by secondary intention. A gain of CAL of 6 mm and partial root coverage (85.71%) was seen after one month of root coverage procedure (Fig.20), results of which were maintained at the one year recall period ((Fig.21).

DISCUSSION:

Gingival recession is an undesirable condition resulting in root exposure, unaesthetic appearance, dentine hypersensitivity and pre-disposition to root caries. [2] Periodontal plastic surgery has been shown to be effective in reducing gingival recession defects with a concomitant improvement in clinical attachment levels.[13]

The best-known technique for root coverage among pedicle grafts is the laterally positioned pedicle graft introduced by Grupe and Warren [12]

and later modified by Grupe. [14] According to Romanos et al [15] the success of lateral sliding flap when used alone is around 70% root coverage.

Results of studies systematically compiled and published by Cairo et al[16] showed that LPF had a mean root coverage rate ranging from 74% to 96% which is comparable to the root coverage rate of CAF (coronally advanced flap) or CAF+CTG(connective tissue flap).

Laterally positioned pedicle graft offers the advantage of ease in surgical procedure with excellent aesthetics without a second surgical site. [2] It retains its own blood supply from the base of the flap which remains attached to the donor site. This helps nourish the graft and facilitates vascular union with the recipient site [11] Disadvantages, however, include that it is applicable only for single-site recession and there is a possible danger of gingival recession, dehiscence, or fenestration at the adjacent donor site results.[17]

LPF was chosen in the present cases because there was enough thickness and volume of keratinized tissue adjacent to recession defect. The root coverage rates in the present cases utilizing a LPF were 70-85% and were in agreement with the results of the previous studies. Additionally, the case selected in the case series are Miller's class III cases with significant interproximal bone loss. Esteibar et al [18] had demonstrated that complete root coverage of Miller class III recession could only be achieved under certain conditions including complete integrity of the interproximal gingiva, interproximal bone loss <3mm and initial defect width not greater than 3mm .However our reported cases could not meet these requirements . Furthermore, even as CTG is considered the gold standard treatment for single and multiple areas of recession, a simpler, less invasive approach, such as a LPF, may yield an equally acceptable result. Additionally, sub- epithelial connective tissue grafting presents a high degree of predictability when used to treat Miller's classI and II gingival recession but in class III and IV recession defects, the success rate is unpredictable. [19]

However, the follow- up period for our cases was one year; a longer period of evaluation and further controlled studies are required to see long term maintenance of the results of LPF.

CONCLUSION:

Based on the results obtained, it can be concluded that LPF is an effective treatment modality for the management of recession defects affecting teeth in the aesthetic zones of the mouth. There was significant reduction in symptoms of dentine hypersensitivity and the patient was highly satisfied with the clinical outcome.

REFERENCES:

1. American Academy of Periodontology, Glossary of Periodontal Terms. 4th edition. Chicago: American Academy of Periodontology; 2001
2. Goldstein M, Brayer L, Schwartz Z.A critical evaluation of methods for root coverage. Crit Rev Oral Biol Med 1996; 7 (l): 87-98.
3. Hangorsky U, Bissada NB. Clinical assessment of free gingival graft effectiveness on the maintenance of periodontal health. J Periodontol 1980; 51:274-8.
4. Goldman H, Schluger S, Fox L, Cohen DW. Periodontal Therapy, 7th ed. Philadelphia: W.B. Saunders; 1990. p.52.
5. Hall WB. Present status of soft tissue grafting. J Periodontol 1997; 48:587-97.
6. Lang NP, Loe H. The relationship between the width of keratinized gingiva and gingival health. J Periodontol 1972; 43:623-6.
7. Camargo PM, Melnick PR, Kenney EB. The use of free gingival grafts for aesthetic purposes. Periodontol 2000 2001; 27:72-96.
8. Remya V, Kishore Kumar K, Sudharsan S, Arun KV. Free gingival graft in the treatment of class III gingival recession. Indian J Dent Res 2008; 19:247-52.
9. Miyasato M, Crigger M, Egelberg J. Gingival condition in areas of minimal and appreciable width of keratinized gingival. J Clin Periodontol 1977 Aug; 4(3):200-9.
10. Miller P D, Jr. A classification of marginal tissue recession. Int J Periodontics Restorative Dent 1985; 5: 8–13.
11. M. Patel, P.J Nixon, M.F.W.Y. Chan .Gingival recession: part 2. Surgical management using pedicle grafts. British Dental Journal 2011 Volume 211, 315-19.
12. Grupe H E, Warren R F. Repair of gingival defects by a sliding flap operation. J Periodontol 1956; 27: 92–95.
13. Roccuzzo M, Bunino M, Needleman I, Sanz M.Periodontal plastic surgery for treatment of localized gingival recessions: A systematic review. J Clin Periodontol 2002; 29(Suppl 3): 178–194.
14. Grupe HE. Modified technique for the sliding flap operation. J Periodontol 1966; 37:491-495.
15. G. E. Romanos, J. P. Bernimoulin, and E. Marggraf. The double lateral bridging flap for coverage of denuded root surface: longitudinal study and clinical evaluation after 5 to 8 years. Periodontol 1993; 64, 8: 683–88
16. Cairo F, Nieri M, Pagliaro U. Efficacy of periodontal plastic surgery procedures in the treatment of localized facial gingival recessions: a systematic review. J Clin Periodontol 2014; 41 Suppl 15: S44-62.
17. Hou, Lein-tuan Yan, Ji-jong, Cheng-meei Liu. Treatment of the gingival

recession -literature review of current progress .Chin Dent J 2005; 24(2) : 71-78.

18. Esteibar JR, Zorzano LA, Cundin EE, Blanco JD, Medina JR. Complete root coverage of Miller Class III recessions. Int J Periodontics Restorative Dent 2011; 31:e1-7.
19. Dr. Vishal Anand, Dr. Minkle Gulati, Dr. Rohit Bahuguna, Dr. Bhargavi Anand .Connective Tissue Graft and Root Coverage - A Case Report. J Clin Den Res Edu 201 October - December 2.

TABLE:

Table 1. Summary of clinical results in cases 1, 2 and 3 at baseline and after 12 months

Case	Follow-up period (month)	GRD[a] (mm)		% of Root coverage [b]
		Initial	final	
1	12	6.5	1	84.61
2	12	10	3	70
3	12	7	1	85.71
Mean±SD	7 ± 4.58	7.83 ± 1.89	1.66 ± 1.15	80.10 ± 8.76

SD: standard deviation

[a] Gingival recession depth (GRD) was measured as the distance from the CEJ to zenith of marginal gingiva.

[b] % of Root coverage was calculated as follows: [(initial GRD)–(final GRD)/ (initial GRD)] ×100%.

FIGURES:

Clinical photographs (Fig. 1,2) Tooth #41 had a Miller class III gingival recession with GRD of 6.5mm,(Fig. 3) width of gingival recession of 3mm; (Fig.4) Interproximal bone loss; (Fig.5) Preparation of the recipient bed; (Fig.6) Preparation of the donor site; (Fig.7) Donor flap reflected; (Fig.8) Root prominence reduced; (Fig.9) Root conditioning on exposed root done with tetracycline for 3 minutes; (Fig.10) Pedicle sutured; (Fig.11) Exposed bone being protected by aluminium foil ; (Fig.12)

Barricaid light cure dressing placed on surgical site; (Fig.13) Six -month follow-up; (Fig.14,15) Clinical photograph after the one year follow up.

FIGURE 1

FIGURE 2

FIGURE 3

FIGURE 4

FIGURE 5

FIGURE 6

FIGURE 7

FIGURE 8

FIGURE 9

FIGURE 10

FIGURE 11

FIGURE 12

FIGURE 13 FIGURE 14 FIGURE 15

CASE 2 .Clinical photographs (Fig.16) Tooth #41 had a Miller class III gingival recession, GRD: 10mm; (Fig. 17) width of gingival recession: 3.5-4 mm ; (Fig.18) One year follow up.

FIGURE 16 FIGURE 17 FIGURE 18

CASE3. Clinical photographs: (Fig.19) Tooth #41 had a Miller class III gingival recession with GRD of 7 mm; (Fig.20) One month follow-up; (Fig.21) One year follow up.

FIGURE19 FIGURE 20 FIGURE 21