

Comparison of semilunar coronally advanced flap alone and in combination with button technique in the treatment of Miller's Class I and II gingival recessions: A Pilot Study

Ranjit Singh Uppal¹, Rajat Bhandari², Karanparkash Singh Kahlon³

¹Department of Periodontology & Oral Implantology, Genesis Institute of Dental Sciences and Research, Ferozepur, Punjab, India

²Department of Oral and Maxillofacial Pathology, Genesis Institute of Dental Sciences and Research, Ferozepur, Punjab, India

³Department of Public Health Dentistry, Laxmi Bai Dental College, Ferozepur, Punjab, India

Abstract

Background: Gingival recession is one of the most common aesthetic and functional concerns associated with periodontal disease. A variety of surgical procedures have been introduced to the field of cosmetic periodontology for treatment of gingival recession.

Aim: To evaluate and compare clinical outcome of semilunar coronally advanced flap with and without button technique in the treatment of Miller's Class I and II gingival recessions.

Study Design: A total of 12 subjects with bilateral single Miller's Class I and II recession were selected for the study. Split mouth design was used.

Materials and Method: Surgical sites were randomly divided into test and control groups. In control sites SCAF alone was done where as in test site a combination of SCAF and button technique was performed. The clinical parameters including gingival recession, periodontal pocket depth, clinical attachment level and width of keratinized gingiva were

recorded at baseline and 6 months postsurgery. Data so collected was put to statistical analysis.

Statistical Analysis: Student t-test was used to find significance of parameters between baseline and 6 months. For intergroup comparisons paired t-test was performed.

Results: Statistically significant improvements were recorded in both groups from baseline to 6 months. Intergroup comparison yielded statistically significant differences in GR and CAL in favor of test group.

Conclusion: Combination of SCAF and Button technique resulted in statistically significant improvements in clinical parameters as compared to SCAF alone. Future clinical studies with much larger sample size and longer follow up periods are warranted.

Key words: Semilunar coronally advanced flap, button technique, gingival recession, root coverage.

Introduction

Gingival recession is one of the most common aesthetic and functional concerns associated

with periodontal disease.[1] It is the displacement of soft tissue margin apical to cemento-enamel junction[2] and is very common in patients having good oral care standards as well.[3] It may be associated with inflammatory periodontal disease, mechanical trauma or with the presence of factors such as tooth malposition, root prominences, aberrant frenulum attachment and orthodontic tooth movements etc.[4,5] It is an aesthetically undesirable condition that may lead to root dentine hypersensitivity and root caries.[6]. A variety of surgical procedures have been introduced to the field of cosmetic periodontology which include free gingival grafts, guided tissue regeneration, pedicle flaps such as semilunar coronally advanced flap, lateral sliding flap, double papilla flap etc. for treatment of gingival recession.[7,8] Semilunar coronally advanced flap (SCAF) was introduced in 1986 by Tarnow.[9] Major advantage of this flap technique is that no sutures are required because of lack of tension on the tissue being coronally positioned. But concerns regarding flap stability without sutures have been raised in previous studies particularly in teeth with highly scalloped gingiva. Thus various modifications of this flap technique have been introduced.[10] A previous study had compared SCAF in treatment of gingival recession with and without tissue adhesive. Tissue adhesive was used with an aim to improve stability of the flap.[11] The objective of our study was to evaluate and compare clinical outcome of semilunar coronally advanced flap with and without button technique in treatment of Miller's Class I & II gingival recession.

Materials and Method

The study was conducted in Genesis Institute of Dental Sciences and Research, Ferozpur, India. The clearance for the study was granted by Institutional Ethical Committee. 12 subjects with bilateral single Miller's Class I and II recession defects were selected for the study. Selected subjects were non-smokers, systemically healthy and had acceptable levels of oral hygiene standards. A written informed consent was

obtained from all the participants. Miller's Class III and IV recession defects, smokers, teeth with cervical caries or restorations were excluded. Selected subjects underwent phase I periodontal therapy. The surgical sites were randomly divided into control group and test group by coin flip method. In control site, SCAF was performed using Tarnow's technique. In this flap was advanced coronal to CEJ as far as possible and positioned accordingly without any tension. A gentle pressure was applied to ensure proper adaptation and stabilization of flap. Periodontal dressing was placed. In test sites, same technique was followed but the flap was stabilized by suture using button technique. Sutures were removed after 10 days. (Figure 1-4)



Figure 1: Miller's Class I Recession at Canine

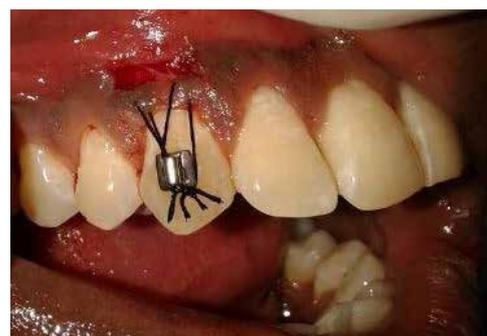


Figure 2: Semilunar coronally advanced flap stabilized with button technique



Figure 3: After suture removal



Figure 4: Complete recession coverage (6 Months Postsurgery)

All the subjects were instructed to discontinue tooth brushing around the surgical sites for three weeks. During this period they were advised to use 0.2% chlorhexidine twice daily. Clinical parameters including gingival recession (GR), clinical attachment level (CAL), probing pocket depth (PPD) and width of keratinized gingiva (WKT) were recorded at baseline (just before surgery), and after 6 months. To ensure minimal operator bias clinical parameter recording and surgical procedures were performed by same operator.

Statistical Analysis

Descriptive statistical analysis has been carried out in the present study. Significance is assessed at 5% level of significance. Student t-test has been used to find the significance of clinical parameters from baseline to 6 months. For intergroup comparisons paired t-test was performed.

Results

All the subjects completed the follow up. There was no post-operative complication in any of the subjects. Healing was uneventful. Mean plaque scores were maintained throughout the study period indicating good standard of plaque control. Mean and standard deviation of clinical parameters for both groups at baseline and after 6 months are shown in Table I and II respectively.

A statistically significant reduction in gingival recession was observed in both test group and control group from baseline to 6 months. An overall reduction of 2.35 ± 0.22 mm was reported in test group, whereas it was 1.38 ± 0.17 for control group. When reduction in gingival recession was compared among groups, a statistically significant result was obtained in favor of test group ($p < 0.001$) [Table 3]. Clinical attachment level gain of 2.92 ± 0.21 mm and 2.17 ± 0.13 mm was obtained in test and control group respectively after 6 months. Intergroup comparison for CAL yielded a statistically significant result, which was in favour of test group ($p = 0.024$) [Table 3]. In test group a mean probing pocket depth reduction of 0.42 ± 0.07 mm was recorded after 6 months. For control group mean reduction of 0.08 ± 0.27 mm in probing pocket depth was reported. Statistically non significant results were obtained on intergroup comparison of probing pocket depth ($p = 0.73$) [Table 3]. An increase of 0.58 ± 0.01 mm in keratinized gingiva was reported after 6 months in test groups which was statistically significant. For control group a statistically significant gain of 0.33 ± 0.01 mm was reported in keratinized gingiva.

Discussion

The changing face of dentistry has ushered in a new era where the present day aim is to have a healthy and esthetically pleasing dentition. Thus esthetics has become an essential criterion of the overall treatment plan in dentistry, which comprises of a healthy and beautiful smile at any age.[12] Gingival recession is of great esthetic concern associated with periodontal

disease. Coronally advanced flap is one of the most reliable techniques for treatment of single gingival recessions and different surgical flap designs have been proposed overtime increasing the possibility of achieving root coverage.[13,14] A semilunar coronally advanced flap has various advantages such as no tension on flap, no suture requirement and no vestibular shortening and moreover papilla remain unchanged.[9]

The present study was done to compare the clinical outcome of SCAF alone and in combination with button technique in treatment of gingival recession. In button technique, orthodontic buttons/brackets are used as a passive component for holding sutures so as to provide maximum stability to the flap in coronally displaced position.[15] A previous study had compared SCAF in the treatment for gingival recession with and without tissue adhesive and concluded that SCAF followed by application of EPIGLU is an effective procedure for root coverage.[11] Some other studies had also warranted the fixation and stabilization of flap for attaining better results.[10,16]

In present study, a split mouth designed was used and sites were randomly assigned to two treatment groups (Test and Control groups). Eight out of twelve sites in test group gained complete root coverage whereas in control group seven sites achieved complete root coverage. These findings are in agreement to previous studies of Sandro-Bittencourt et al 2006[17] , Sandro-Bittencourt et al 2009[18] A statistically significant reduction of 2.35 ± 0.22 mm and 1.38 ± 0.17 mm was recorded in gingival recession in both test and control group respectively. Decrease in gingival recession may be due to the formation of new connective tissue attachment and epithelial attachment.[19] Intergroup comparison yielded statistically significant results in favor of test group. This may be attributed to the use of button technique in test sites as suturing the flap with button offer better stabilization in desired location.[10] Less amount of recession

reduction in control group may also be due to lack of stability of coronally positioned flap to counteract wound contraction. This may also be the reason for greater gain in clinical attachment level in test sites as compared to control sites. Gain in clinical attachment level was statistically significant for both the groups after six months which was in accordance to previous clinical trials.[17,18] Intergroup comparisons revealed a statistically non significant results for probing pocket depth. A statistically significant increase in width of keratinized gingiva was reported in both groups after 6 months but intergroup comparison revealed a statistically non significant difference. In SCAF granulation tissue that fills the semilunar area will generally turn into same type of tissue that was present before repositioning the tissue. Increase in width of keratinized gingiva is due to the tendency of coronally displaced mucogingival line, to regain its original position. Plaque scores for both groups remained constant through out the study period as the patients were reinforced towards better oral hygiene at regular intervals.

Some previous studies have compared coronally advanced flap with and button technique and reported better results with use of an orthodontic button.[17,18,20,21] To best of our knowledge, this is the first study which compared SCAF with and without button technique. Limitations of this study included smaller sample size and short follow up period (6 months). The present study also hinted us regarding the use of combination of SCAF and Button in lower teeth for root coverage as well. As SCAF is a simple procedure in comparison to highly expensive alternatives so future studies with larger sample size and longer follow up period are warranted for better exploration of the findings.

Conclusion

Combination of SCAF and Button technique resulted in statistically significant improvements in reduction of gingival recession and clinical attachment level gain as compared to SCAF alone. Future clinical studies with much larger

sample size are warranted and longer follow up periods are warranted.

References

Babuz SK, Agila S. Root coverage with a free gingival autograft using a diode laser. *J Dent Lasers* 2012;6:72-5.

Cairo F, Pagliaro U, Nieri M. Treatment of gingival recession with coronally advanced flap procedures. *J Clin Periodontol* 2008;35:136-62.

Chambrone L, Sukekawa F, Araugo MG, Pustiglioni FE, Chambrone LA, Lima LA. Root coverage procedures for the treatment of localized recession type defects: a Cochrane systematic review. *J Periodontol* 2010;81:452-78.

Fatima Z, Bey A, Mian F, Zia A. Management of gingival recession using coronally advanced flap combined with bracket application. A case report. *J Adv Med Dent Sci* 2014;2(2):171-5.

Glover ME. Periodontal plastic and reconstructive surgery. In: Rose LE, Mealay BL, Genco RJ, Cohen DW. Editors. *Periodontics: Medicine, Surgery and Implants*:2004 p 406-87.

Haghighat K. Modified semilunar coronally advanced flap. *J Periodontol* 2006;77:1274-9.

Jahangirnezhad M. Semilunar coronally repositioned for treatment of gingival recession with and without tissue adhesive: A pilot study. *Journal of Dentistry TUMS* 2006;3(1):36-9.

Kumar GV, Murthy KV. A comparative evaluation of subepithelial connective tissue grafts (SCTG) versus platelet concentrate graft (PCG) in the treatment of gingival recession using coronally advanced flap technique: A 12 month study. *J Indian Soc Periodontol* 2013;17:771-6.

Maroo S, Grover S, Luthra S. Button assisted coronally advanced flap: An innovative orthopedic amalgamation. *J Ind Orthod Soc* 2014;48(2):129-33.

Moka LR, Boyapati R, M Srinivas, Swamy N, Swarna C, Putcha M. Comparison of coronally advanced and semilunar coronally repositioned

flap for the treatment of gingival recession. *J Clin Diagn Res* 2014;8(6):zc04-8.

Ozcelik O, Haytac MC, Seydaoglu G. *J Clin Periodontol* 2011;38(6):572-80.

Peeran SW, Thirunervannan M, Mugarbhi M. Semilunar coronally repositioned flap. *Arch Int Surg* 2013;3:166-8.

Ravon NA, Handelsman M, Levine D. Multidisciplinary care: periodontal aspects to treatment planning the anterior esthetic zone. *J Calif Dent Assoc* 2008;36:575-84.

Sandro B, Erica Del PR, Enilson AS. Comparative 6-month clinical study of a semilunar coronally positioned flap and subepithelial connective tissue graft for the treatment of gingival recession. *J Periodontol* 2006; 77:174-81.

Sandro B, Erica Del PR, Enilson AS. Semilunar coronally repositioned flap or subepithelial connective tissue graft for the treatment of gingival recession: A 30-month follow-up study. *J Periodontol* 2009; 80:1076-82.

Serino G, Wennstrom JL, Lindhe J, Eneroth L. The prevalence and distribution of gingival recession in subjects with a high standard of oral hygiene. *J Clin Periodontol* 1994;21:151-9.

Tarnow DP. Semilunar coronally repositioned flap. *J Clin Periodontol* 1986;13:182-5.

Tozum TF, Dinni FM. Treatment of adjacent gingival recessions with subepithelial connective tissue grafts and modified tunnel technique. *Quintessence Int* 2003;34(1):7-13.

Tugnait A, Clerehugh V. Gingival recession: its significance and management. *J Dent* 2001;29:381-94.

Wennstrom JL. Mucogingival therapy. *Ann Periodontol* 1996;1:671-701.

Wennstrom JL, Zucchelli G. Increased gingival dimensions. A significant factor for successful outcome of root coverage procedures? *J Clin Periodontol* 1996; 23: 770-7.

Tables

Table I: Clinical parameter changes in Test Group.

Parameters	No.	Baseline	After 6 months	p-value
		Mean +SD	Mean +SD	
GR	12	2.45+0.42	0.10+0.21	<0.001*
CAL	12	4.17+0.71	1.25+0.62	0.000*
PPD	12	1.25+0.45	0.83+0.38	0.339
WKT	12	0.92+0.52	1.5+0.51	0.027*

*Statistically significant.

Table II: Clinical Parameter changes in Control Group

Parameters	No	Baseline	After 6 months	p-value
		Mean +- SD	Mean+- SD	
GR	12	2.35+0.22	0.72+0.58	<0.001*
CAL	12	3.67+0.65	1,59+0.52	.000*
PPD	12	1.08+0.29	1.00+0.02	.017*
WKT	12	1.50+0.674	1.83+0.83	0.104

* Statistically significant

Table III: Intergroup Comparison

Parameter	Group	No.	Mean+- SD	t- value	p-value	Significance
GR	Test	12	2.35+0.22	0.692	0.001	S
	Control	12	1.38+0.17			
CAL	Test	12	2.92+0.21	2.429	0.024	S
	Control	12	2.17+0.13			
PPD	Test	12	0.42+0.07	0.312	0.73	NS
	Control	12	0.08+0.27			
WKT	Test	12	0.58+0.01	-1.431	0.167	NS
	Control	12	0.33+0.01			

S- Statistically significant

NS- Statistically Non Significant