



Comparative Analysis of Semilunar Repositioned Flap V/S Bernotti V-Y Flap Incision in Treatment of Miller's Class I and Class II Gingival Recession

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KEYWORDS

Gingival Recession, Semilunar, Bernotti, Microsurgery, Magnification.

ABSTRACT:

Introduction: Multiple treatment modalities has been reported in the literature for the management of Miller's Class I & II single/multiple gingival recession in order to rehabilitate the normal gingival contour, architecture and function. Due to some limitations of the conventional techniques, it is important to bring an alteration towards more conservative approach of treating the gingival recession and to get the best possible and predictable outcome.

Aim: The aim of this study is to compare Semilunar Repositioned Flap Incision and Bernotti V-Y Flap Incision in the treatment of Miller's class I and class II gingival recession.

Material and methods: A total of twenty eight (28) patients, age 19-30 years with 28 sites of Miller's class I and Class II Gingival Recession (GR) on the facial aspect in both the anterior arches were selected. Group I was treated by semilunar repositioned flap incision while group II by Bernotti V-Y flap incision. Clinical parameters recorded were Recession height, Recession width, Probing depth, Relative Clinical Attachment Level, Plaque index, bleeding on Probing, Width of Keratinized Tissue, and Root coverage aesthetic score at baseline, 1, 3 & 6 months postoperatively using paired and unpaired t test.

Results: Complete root coverage and gain of clinical attachment level are achieved in both approaches.

Conclusion: This Clinical study demonstrates similar results in both approaches.

1. Introduction

Gingival recession (GR) is the exposure of the root surface resulting from migration of the gingival margin apical to the cemento-enamel junction (CEJ). GR presents one of the most common aesthetic and functional problems (difficulty in plaque control, increased susceptibility to root caries and dentin hypersensitivity etc.) of the periodontium.^{1,2,3} Multiple treatment modalities has been reported in the literature to treat single/multiple gingival recession to rehabilitate the normal gingival contour, architecture and function which includes free gingival autograft⁴, pedicle flap⁵, Sub epithelial connective tissue graft⁶,

Guided Tissue Regeneration⁷ and Pouch and Tunnel Technique.⁸

Dental sciences have gone through a plethora of changes both in concepts and techniques in the last few decades. The use of magnification loupes, surgical operating microscope and microsurgical instruments is widely acclaimed and incorporated in Periodontics with the aim of achieving magnification, a clean, non ragged incision and wound healing by primary intention.⁹



2. Objectives

Therefore, looking after the advantages of SCAF10,11, Microsurgery and Bernotti V-Y12 and scarce literature related to microsurgical periodontal therapy and Bernotti V-Y Incision; the present study was designed to compare Semilunar repositioned flap and Bernotti V-Y flap incision in the treatment of Miller's class I and class II gingival recession.

3. Methods

The present triple blind, randomized clinical study was conducted in the Department of Periodontology and Oral Implantology, Meerut. A total of twenty eight (28) patients with 28 sites of Miller's class I and Class II Gingival Recession (GR) on the facial aspect in both the anterior arches were selected by coin toss amongst the 36 patients fulfilled the inclusion and exclusion criterion and had shown willingness to participate in the study and submitted written signed consent.

Inclusion and Exclusion Criterion

Both males and females were selected with age between 19-30 years having Miller Class I and Class II Buccal/Labial GR in the anterior teeth and premolars and Pocket Depth <3mm with minimal bleeding on probing as well as width of keratinized tissue should be more than 2mm.

The patients excluded were those with Presence of apical radiolucency, Caries on Buccal/labial surface & Restorations on buccal surface, Tobacco users, Patients with debilitating disease and Patients with untreated periodontal disease.

Clinical Parameters

Pre procedural records included consent form (annexure), detailed medical and dental history, routine blood investigations, study models, acrylic stent. Clinical parameters included recession height13, Recession width14, Probing depth15, Relative Clinical Attachment Level16, Plaque index17, bleeding on Probing18, Width of Keratinized Tissue19, and Root coverage aesthetic score20.

A total of Twenty eight (28) patients of age between 19-30 years with 28 Class I & II GR on the facial aspect were selected as per consort flow chart of study. All the selected patients had undergone phase one therapy, blood and routine urine examination one week before surgical intervention. Intraoral antiseptics was achieved

using 0.2% chlorhexidine rinse. Anesthesia will be performed by infiltration anesthesia using 2% lignocaine with 1:100,000 epinephrine. Thorough root planing will be done with hand, rotary and ultrasonic instrumentation in all GR sites under both groups and thoroughly irrigated with normal saline.

Group I: A semilunar incision is made following the curvature of the receded gingival margin and ending about 2 to 3 mm short of the tip of the papilla(Figure 1E) followed by split thickness dissection through intramuscular incision till the coronal end of semilunar incision and pedicle flap was achieved using microsurgical instruments(Figure 1F). The pedicle flap was collapse coronally, covered the denuded root surfaces; to enhance flap stabilization 5-0 vicryl sutures were applied.

Group II: The root surface is modified using amoxicillin slurry for 3 min (Figure 2D). In this a submarginal supraperiosteal V-shaped incision 1 mm to 2 mm apical to the mucogingival junction is made which was extended one tooth mesially and distally to the recession defect (Figure 2E). Split thickness dissection through intramuscular incision till the coronal end of V incision and pedicle flap was achieved using microsurgical instruments (Figure 2F).The pedicle flap was displaced coronally to cover the denuded root surfaces and flap stabilization was obtained utilizing 5-0 Vicryl sutures.

Both group patients were performed by utilizing microsurgical technique (Magnification loop, microsurgical blades, suture, needle holders etc.)

Post Operative (SOS PARACETAMOL 500MG) and oral hygiene instructions (Chlorhexidine mouth rinse 0.2% rinsing twice daily for 10 days 30 minutes after food and to be started after 24 hour post operatively, not to perform tooth brushing at operated sites.) All the patients' surgical sites healed uneventfully in both the groups except one patient who left the study in between in group I, therefore, was excluded from the study of Group I. Rest all the patients treated in Group I and Group II were re-evaluated clinically for RW,RH,PD,RAL,WKT,PI,BOP at **1 month,3 & 6 Months**{Figure 1,2 (H,I)} postoperatively respectively. Phase I therapy was reinforced whenever necessary.

Statistical Analysis

All the patients, Principle Investigator and statistician were blinded. Surgical procedures were performed by trained principle investigator but all the baseline and



post-operative data assessment was carried out by one trained clinician who was not the part of the study. After collection of data, masking was carried out by data collector and sent for statistical analysis. All the values were expressed in the form of Mean, Standard Deviation. The parameters were compared between the groups using Un-paired t test and Paired t test for intra-group comparison. The statistical analysis was performed by utilizing data analysis software SPSS 27.

4. Results

Table I shows the mean and standard deviation of both the groups at baseline, 1month,3 months and 6 months as well as the clinical improvement from baseline to 6 months as calculated by the mean difference for each time interval. The Overall comparison of PI between baseline to 1-month, 3-months, 6-months, 1 to 3-month, 1 to 6-months and 3 to 6-month post operatively in Group I, II was found to be statistically significant ($p<.05$) at all respective intervals except between 1-6 & 3-6 month post operatively utilizing paired 't' test. The Overall comparison of PI between baseline to 1-month, 3-months, 6-months, 1 to 3-month, 1 to 6-months and 3 to 6-month post operatively in Group I, II was found to be statistically non significant ($p>.05$) at all respective intervals utilizing unpaired 't' test (Table II) .The Overall comparison of BOP between baseline to 1-month, 3-months, 6-months, 1 to 3-month, 1 to 6-months & 3-6 post operatively in Group I, II was found to be statistically significant ($p<.05$) at all respective intervals utilizing paired 't' test. (Table II) The Overall comparison of BOP between baseline to 1-month, 3-months, 6-months, 1 to 3-month, 1 to 6-months and 3 to 6-month post operatively between Group I& II was found to be statistically non significant ($p>.05$) at all respective intervals utilizing unpaired 't' test. (Table II). The Overall intragroup comparison of PD between baseline -1-month, 3-month, 6-month, 1 - 3-month, 1- 6-month as well as at 3- 6-month post operatively was found to be statistically significant ($p<.05$) at all the intervals for Group I and II except between 1-6 month post operative interval respectively, (Table II) The Overall comparison of PD between baseline to 1-month, 3-months, 6-months, 1 to 3-month, 1 to 6-months and 3 to 6-month post operatively between Group I& II was found to be statistically non significant ($p>.05$) at all respective intervals utilizing unpaired 't' test. (Table II). The Overall intragroup comparison of W.K.T between baseline -1-month, 3-month, 6-month,

1 - 3-month, 1- 6-month as well as at 3- 6-month post operatively was found to be statistically significant ($p<.05$) at all the intervals for Group I and II except between 1-6 month post operative interval for Group 2 respectively. (Table II)

5. Discussion

Casing the denuded root surfaces is one of the important goals of mucogingival surgeries and the best result can only be achieved by choosing the most appropriate periodontal plastic surgical technique (PPST) for better aesthetic outcome with least post-operative complications²¹when performed by the expertise clinician. In spite of numerous PPSTs, the inherent problems of a limited quantity of available graft, the need for two surgical sites, compromised patient aesthetics, post operative discomfort and complications²² and increased cost of treatment have limited the success of single PPST which can be used with high predictability, effectiveness, and efficiency without compromising patient centered criteria such as pain, post operative esthetic outcomes and cost of treatment.²³ Giving due considerations to the limitations mentioned above; the present triple blind randomized clinical study was executed to access the predictability and reliability of the semilunar incision and Bernotti V-Y Incision assisted coronally advanced flap for the treatment of Millers class I and II gingival recession in single tooth in anterior region of both arches utilizing the magnification loops, microsurgical instruments and sutures.

The significant improvement in Plaque Index (PI) & Bleeding on probing were observed in both the groups on intragroup comparison. The reason for this improvement may be because the patient maintained good oral hygiene as instructed time to time as well as due to maintenance therapy executed. Pocket depth improvement and gain in relative attachment level (RAL) was reported to be 74.55% and 44.09% in group 1(Semilunar flap) patients. This is in accordance with the study by **Jenabian et al, 24 Baldi et al, 25 and Pilloni et al²⁶** who reported significant improvement in pocket depth and clinical attachment level (CAL) from baseline to 6 months. The exact reason for increase in RAL following modified CAF procedures (SCAF) is still not clear; as the histological studies regarding the healing of pedicle flaps (e.g., CAF or rotational flap) have shown mixed results which varied from complete long junctional epithelial attachment to partial



connective tissue attachment in the apical part and epithelial adaptation in the coronal part.²⁷In the present study, however, exact nature of reattachment could not be known as histologic evaluation of new attachment apparatus was not done. In group 2(Bernotti V-Y Incision) patients improvement in probing depth and RAL observed was 75.41%&44.55%. The reason for the same is as discussed above.

Significant reduction in recession width and recession height was observed in both the groups from baseline to 6 months. The outcome achieved under group 1 patients may be due to secondary intention of healing at the base of the flap causing the retraction of the tissue.²⁸

64.87% & 52.08% improvement in width of keratinized gingiva from baseline to 6-months was observed in group 1 patients and group 2 patients respectively. This is in accordance with the report of Bittencourt et al²⁹ in 2007 and Govindasamy et al²⁸ in 2020 who reported a statistically significant gain in width of keratinized gingiva till 12th week. The outcome achieved may be because of the granulation tissue that fills the incision area and will generally turn into the same type of tissue that was present before the repositioning.

Root coverage improvement was reported to be 22.68% and 38.39% in group 1 and group 2 patients. This root coverage improvement might be due to the amalgamation effect of root surface biomodification (RMD), microsurgery assisted CAF utilizing semilunar or V-Y assisted incision; as RMD helps in removing the smear layer and bacterial endotoxins from the root surface which could facilitate periodontal regeneration as reported by Demirel³⁰ in 1991 Torkzaban³¹ et al in 2016 whereas microsurgery assisted CAF utilizing semilunar or V-Y assisted incision provided an atraumatic approach, improves dexterity of the operator, improves the visual acuity ergonomic benefit, decreased patient morbidity, predictability, rapid healing in addition to simultaneous advantages of eliminating the tension on flap as well as permitting passive displacement of flap till CEJ by both surgical techniques.

To the best knowledge, this was the first study of Microsurgical assisted coronally displaced flap utilizing Bernotti V-Y incision to the best of our knowledge, therefore direct comparison may not be available in the web of literature. Therefore the data obtained from this technique has been considered as baseline data for future studies.

Limitation of the study

Small sample size with short term analysis

Histological analysis has not been executed which is the best way for the interpretation of periodontal soft tissue regeneration.

Conclusion:

On the basis of the results it was concluded that both the microsurgical assisted semilunar and Bernotti V-Y incision assisted coronally advanced flap were equally effective for the management of Miller's class I and class II gingival recessions.

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		LUNAR)	NOTTI)	R)	NOTTI)
P	BAS	2.115±.4	2.719±.		
D	E	16	372		
	3	.654±.24	.607±.2	74.55%	75.41%
	MO	0	13		
	NTH				
	S				
	6	.538±.13	.536±.1		
	MO	9	34		
	NTH				
	S				

RAL	BASE	3.577±.432	3.607±.446		
	LINE				
	3	2.115±.487	2.07±.514	44.09%	44.55%
	MONTHS				
	6	2.00±.392	2.00±.439		
	MONTHS				
PI	BASE	1.135±.182	1.182±.181		
	LINE				
	3	.962±.118	.911±.084	18.98%	27.49%
	MONTHS				
	6	.919±.109	.857±.117		
	MONTHS				
BOP	BASE	1.385±.506	1.429±.514		
	LINE				
	3	1±0	1±0		
	MONTHS			27.78%	30.00%
	6	1±0	1±0		
	MONTHS				
	3	.577±.28	.493±.198		
	MONTHS				
	6	.577±.28	.493±.198		
	MONTHS				

PROBABLE VALUES OF UN-PAIRED / INDEPENDENT “t” TEST B/W GROUPS (GROUP—1 & GROUP—2)(INTER GROUP

TABLE I: MEAN ± SD OF ALL CLINICAL PARAMETERS OF BOTH GROUP AT BASELINE, 3MONTH AND 6MONTH AND THE CLINICAL IMPROVEMENT FOM BASELINE TO 6 MONTH

TIM	E-	POI	NTS	MEAN ± S.D.		% IMPROVEMENT FROM BASELINE TO 6MONTH BY MEAN DIFFERENCE
				GROUP -- 1(SEMI	GROU P-- 2(BER	
				GROUP 1(SEMI	GROU P 2(BER	
				NLUNA	2(BER	

		PAIR OF TIME-POINTS	PROBABLE VALUES OF PAIRED”t” TEST B/W TIME-POINTS(INTRA GROUP)	GROU P-1 (SEMI LUNA R)	GROU P-2 (BER NOTT I)	0.2452
1		B/W BAS E LIN E – 3 MO NTH S	0	0	0	0.2633
		B/W BAS	0	0	0	0.178



	P.D.	E L I N E – 6 M O N T H S				B/W 3 M O N T H & 6 M O N T H S	0	0	0.2965		
		B/W 3 M O N T H & 6 M O N T H S	0	0	0.4521		B/W B A S E L I N E – 3 M O N T H S	0.0004	0.0031	0.2478	
2	W.K.T.	B/W B A S E L I N E – 3 M O N T H S	0	0	0.223	4	B.O.P.	B/W B A S E L I N E – 6 M O N T H S	0	0	0.1887
		B/W B A S E L I N E – 6 M O N T H S	0	0.0021	0.3645			B/W 3 M O N T H & 6 M O N T H S	0.014	0.042	0.2412
	(WIDT H O F K E R A T I N I Z E D G I N G I V A L)	B/W 3 M O N T H & 6 M O N T H S	0	0.0001	0.1889	5	R.C.	B/W 3 M O N T H & 6 M O N T H S	1	1	0.188
		B/W B A S E L I N E – 3 M O N T H S	0.0132	0.021	0.3652			B/W 1 M O N T H & 6 M O N T H S	0.1338	0.016	
3	R.A.L.	B/W B A S E L I N E – 6 M O N T H S	0.0166	0.011	0.2412						

TABLE II: COMPARISON B/W SUCCESSIVE TIME-POINTS IN TWO GROUPS CORRESPONDING THE DIFFERENT PARAMETERS



(INTRAGROUP COMPARISON)



FIGURE 2: BERNOTTI V-Y FLAP INCISION (A) Pre Operative (B) Probing depth (C)RAL (D)Root biomodification with amoxicillin slurry (E)BERNOTTI V-Y FLAP INCISION and Split Thickness Dissection (F)Displacement of flap (G) Post Operative 1 Month (H) Post Operative 3 Month



FIGURE 1: SEMILUNAR FLAP (A)Pre operative (B)Probing depth (C)RAL (D)Semilunar incision (E)Split thickness dissection with microsurgical instruments (F)Coronal Displacement Of The Flap (G) Post Operative at 1 month (H) Post Operative at 3 month