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Abstract:

Objective: The treatment of buccal gingival recession (GR) is a common requirement due to aesthetic concern, root caries and/or root hypersensitivity. The purpose of this case study was to evaluate the success and predictability of sliding pedicle graft in combination with the vestibular deepening technique for the management of Miller's Class III gingival recession.

Methods: A Saudi male adult, aged 30 years was selected having Miller's Class III GR 5.0 mm on the lower left central incisor. Nonsurgical periodontal therapy was provided for the patient to ensure periodontal health. Sliding pedicle graft along with the vestibule deepening technique was applied. Patient was followed up monthly for 2 months.

Results: Root coverage 60.0% and clinical attachment gain 3 mm were evident following 2 months of periodontal surgery.

Conclusion: Sliding pedicle graft in combination of vestibular deepening may be applied as an effective technique to increase the width of attached gingiva and treat Class III Miller's type of gingival recession. Long term continuous monitoring of the case would be conclusive.

Key words: Miller's Class III GR, attached gingiva, sliding pedicle gingival graft, shallow vestibule, vestibule deepening technique.

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Introduction:

Gingival recession (GR) can be defined as the exposure of the root surface caused by an apical shift in the gingival margin¹, which is normally circumferential and 1-3 mm coronal to the cemento-enamel junction (CEJ)². GR results in an unaesthetic appearance, root hypersensitivity and root caries.^{3,4} Studies showed recession increases with age and a substantial increase for each decade of life.^{5,6-12} Almost 90% of Americans have at least one site with 1 mm of recession by the age of 60, while about 40% have at least one site with 3 mm of recession.^{9,12} Sites with recession are likely to progress.¹⁰ Untreated recession sites in patients not receiving regular dental care are more likely to progress than sites treated with a

gingival augmentation procedure.¹³ Since additional gingival recession increases attachment loss, appropriate treatment is indicated at progressing sites to prevent additional loss of periodontal tissues as well as to improve function and approximate a normal appearance.¹⁴ Shallow vestibule, gingival recession, inadequate width of attached gingiva (AG) and aberrant frenum pull are an array of mucogingival problems for which several independent and effective surgical solutions are reported.¹⁵ Different gingival grafting techniques have been used for the treatment of gingival recession.^{14,16} Grupe and Warren^{17,18} proposed a lateral sliding flap or pedicle graft to cover exposed roots and increase the band of available attached gingiva. Nabers¹⁹ described a technique of

grafting palatal gingiva to increase the zone of attached gingiva. Attempts to use a free gingival graft to obtain root coverage have also been successful. Recently, guided tissue regeneration was introduced to treat gingival recession, by the use of bioabsorbable or nonabsorbable membranes.²⁰

Younger in 1902, Harlan in 1906 and Rosenthal in 1911 first described the use of pedicle or free soft tissue grafts to cover denuded root surfaces in order to improve clinical parameters such as recession depth, clinical attachment level and width of keratinized (attached) gingiva. Laterally repositioned flaps, free gingival grafts, coronally advanced flaps and subepithelial connective tissue grafts (Grupe & Warren 1956, Björn 1963, Grupe 1966, Nabers 1966, Sullivan & Atkins 1968, Bernimoulin et al. 1975, Patur 1977).²¹

Mandibular incisor teeth, which have a minimal amount of labial attached gingiva, may be predisposed to periodontal destruction.²² This present study describes the effectiveness of the sliding pedicle graft incorporated with vestibule deepening technique as a single-step surgical entity for increasing the depth of the vestibule, root coverage and for increasing the width of the attached gingiva (AG).

Case Report:

Subject: A Saudi male patient of 30 years having Miller's class III GR on tooth #31 along with the problems of shallow vestibule, inadequate width of AG and with frenum pull underwent this surgical procedure.

Experimental design:

The patient was recruited, based on the following:

Patient inclusion criteria:

- 1) Miller's Class III recession defect.
- 2) Systemically healthy subject.
- 3) Age: >18 years old.
- 4) A full mouth plaque index <20%.
- 5) Non-smoker.
- 6) Absence of tooth mobility.
- 7) A signed informed consent form.

Patient exclusion criteria:

- 1) Previous surgical attempt to correct gingival recession.
- 2) Systemic disease or severe immune deficiency.
- 3) Coagulation defect or current anticoagulation treatment.
- 4) Addiction to drugs.
- 5) Subjects unable or unwilling to complete the trial.

- 6) Lack of linguistic skills or psychiatric disorders or decline to sign the informed consent.
- 7) Molar or premolar teeth with furcation involvements.

At baseline and 2 months after surgery the following parameters were recorded:

- GR was measured from the cemento-enamel junction (CEJ) to the gingival margin at the mid-labial point of the teeth involved, using a University of Michigan 'O' periodontal probe with William's markings (Hu-Friedy).
- Attached gingival width (AGW- distance from base of the pocket to mucogingival junction) was measured from the mucogingival junction (MGJ) to the gingival margin.
- Recession width (RW) was measured at the CEJ.
- Probing pocket depth (PPD- distance from the gingival margin to base of the pocket) and clinical attachment level (CAL- distance from the CEJ to base of pocket) were measured.
- Bone loss [(BL%- radiolucency, extended from the CEJ towards the root apex) Radiographic distance between CEJ and root apex is considered as 100%] was measured.

Full mouth scaling, root planing and polishing (SRP) were performed and a plaque control instruction was given 1 month before surgery.

Table-1: Miller's Classification of Gingival Recession (GR).

Class of GR	Tissue Condition	Success (%)
Class I	Recession does not extend to the mucogingival junction and is not associated with interdental bone resorption.	100
Class II	Recession extends beyond the mucogingival junction with no interdental bone resorption.	100
Class III	Recession is associated with interdental proximal bone resorption and one proximal root exposition.	50-70
Class IV	There is mesial and/or distal proximal bone resorption with exposure of more than one proximal root surface. The papillae are at the same level as the recession.	0-10

Ref.: Miller PJ. A classification of marginal tissue recession. Int J Periodont Resto Dent 1985;5:8-13.

Fig.1: Preoperative photographs showing GR and BL.

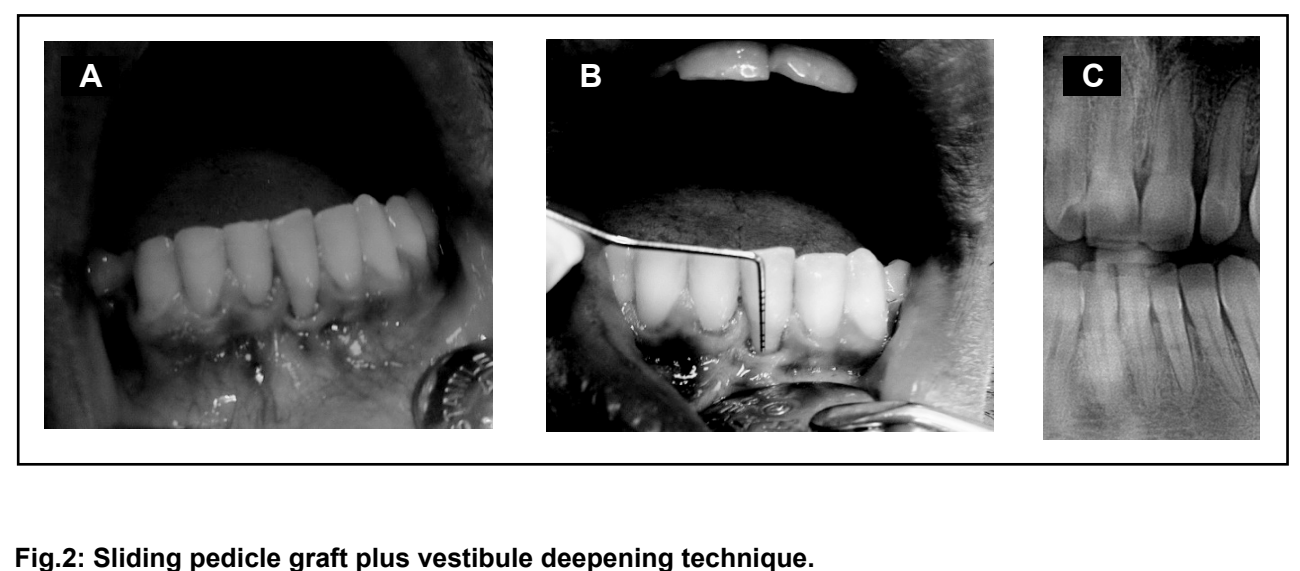


Fig.2: Sliding pedicle graft plus vestibule deepening technique.

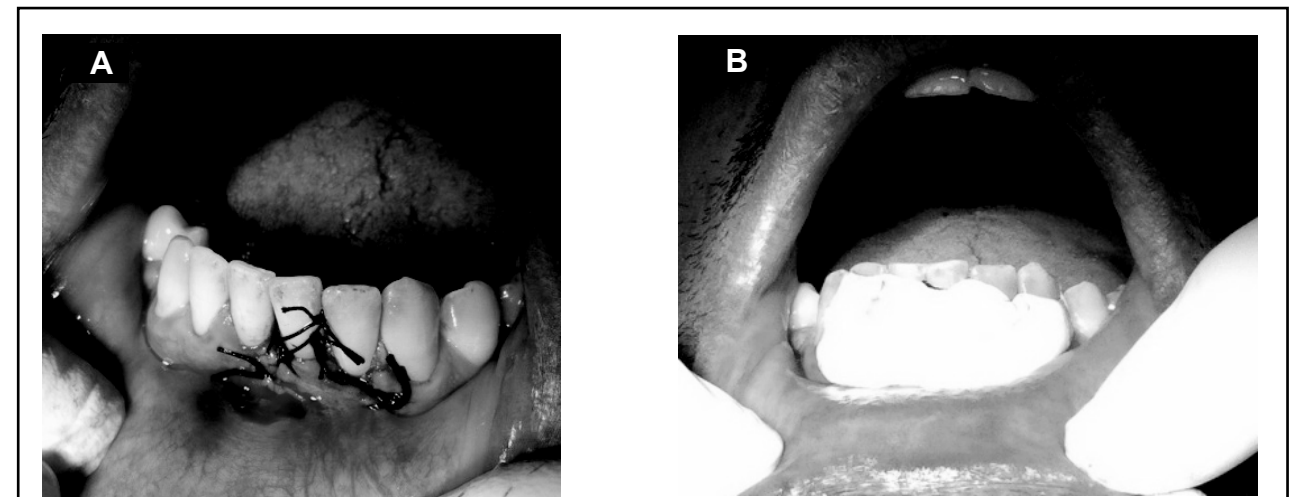
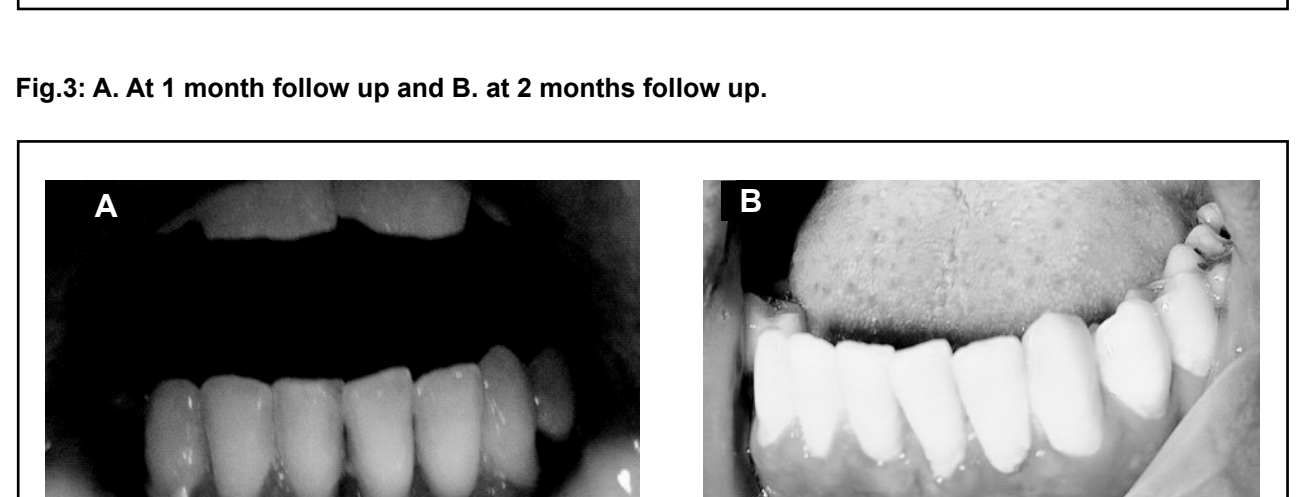


Fig.3: A. At 1 month follow up and B. at 2 months follow up.



The percentage of root coverage was calculated using the following formula:

$$\frac{\text{Preoperative recession depth} - \text{Postoperative recession depth}}{\text{Preoperative recession depth}} \times 100$$

Pedicle soft tissue graft procedure:

A pedicle flap of gingiva can be raised from an edentulous ridge, adjacent teeth, or from the existing gingiva on the tooth and moved laterally or coronally to replace alveolar mucosa as marginal tissues. The procedure can be used to cover an exposed root or to eliminate a gingival defect if the root is not too prominent in the arch. It was originally described as a "sliding flap" or lateral pedicle flap (LPF) that started as full thickness then became split thickness at the mucogingival junction.¹⁷ The LPF has been primarily indicated for isolated recession defects on mandibular teeth. Investigations of the LPF technique show a mean defect coverage ranging from 61% to 74% with a mean for all studies of 67%.¹⁷ The sliding pedicle graft procedure was performed to cover the root of tooth #31.

Vestibule deepening technique:

A horizontal incision was made through the mucogingival junction severing the labial frenum to make detachment of the vestibular tissue from the attached gingiva. Periodontal pack was dipped into the vestibule to keep the vestibular tissue separated from the attached gingiva.

Finally the periodontal dressing (pack) was placed on the labial and lingual sides of the operated site.

Postsurgical follow up:

The patient was asked to refrain from tooth brushing at the surgical site for two weeks. A prescription of 0.2% chlorhexidine-digluconate mouth rinse twice daily for 3 weeks and a course of antibiotic including amoxicillin 500 mg thrice daily and 400 mg of ibuprofen thrice daily for 5 days was given. Periodontal pack was removed 2 weeks post operatively where attachments of the grafts were satisfactory. After the first week, the area was gently debrided with a cotton swab. After the second week, the patient was instructed to use a soft tooth brush with a roll-technique followed by a 60-second rinse with 0.2% chlorhexidine-digluconate. At the end of the six-week healing period, the patient returned to the usual oral hygiene procedures. The operated site was periodically evaluated postoperative at every month for the consecutive 2 months and relevant measurements (PPD, CAL, GR, AG and root coverage) were taken.

Results:

Throughout the study period the patients maintained a good standard of supragingival plaque control. No adverse events were recorded during the postoperative period. The values of variables measured at baseline, 1 and 2 months after surgery are summarized in (table-2). Root coverage was obtained 60.0% following 2 months of periodontal surgery.

At baseline, probing depth (PPD) was 2.0 mm, reduced to 1.0 mm at 2 months of surgery. The clinical attachment level (CAL) showed improvement from 7.0 mm at baseline to 3.0 mm at 2 months of post-surgery time. Bone loss (BL) percent at baseline was 20.0%, decreased to 5.0% and the width of attached gingiva (AG) increased from 0.5 mm at baseline to 2.5 mm at 2 months of surgery. At baseline, recession depth (GR) was found 5.0 mm that reduced to 2.0 mm at the end of 2 months follow up. The overall percentage of root coverage considering the reduction in recession depth at different time intervals was found to be 60.0% at 2 months.

Table-2: Measurements of different parameters at base line and on follow up visits.

Measurements	PPD (mm)	CAL (mm)	BL (%)	AG (mm)	GR (mm)	Root coverage (%)
At baseline	2	7	20	0.5	5	0
At 1 month	1.5	5	10	1	3	20
At 2 months	1	3	5	2.5	2	60

N.B.: PPD- probing pocket depth; CAL- clinical attachment level; BL- bone loss; AG- attached gingiva; GR- gingival recession.

Discussion:

Mandibular incisor teeth, which have a minimal amount of labial attached gingiva, may be predisposed to periodontal destruction.²² The case was selected and performed pedicle graft procedure to cover the exposed root of tooth #31. Soft tissue pedicle (sliding or double) grafts are designed to create or augment the attached gingiva, deepen the vestibule, or eliminate frenum involvement.¹⁵⁻¹⁸ To increase the success rate of root coverage, many clinicians have attempted to combine different procedures.²⁴ This study included sliding pedicle graft and vestibule deepening techniques simultaneously to achieve the goal. Adequate

vascular supply is essential to achieve complete root coverage. Dual blood supply was obtained from the bone, periosteum, and periodontal ligament underlying the graft and from flap tissue overlying the graft. The success rate in Miller's Class III GR is about 50-70% (table-1) with a 9-12 months postsurgical follow up.¹⁵ This study showed about 60.0% root coverage with a 2 months follow up only. Adequate width of attached gingiva (AG) is necessary to keep the periodontium healthy.^{1,2} The present study showed an increase of the width of AG from 0.5 mm to 2.5 mm and improvements in all other parameters (PPD, CAL and BL) (table-2). Some recession always occurs at the donor site (an average of about 1 mm) when the free margin of the gingiva is involved.²⁵ The present study showed no GR at the donor site (fig.3) at 2 months follow up time.

Conclusions:

Root coverage is a successful and predictable procedure in periodontics that employing a variety of techniques. Sliding pedicle graft in combination of vestibular deepening may be applied as an effective technique to increase the width of attached gingiva and treat Class III Miller's type of gingival recession. Long term monitoring of the cases and proper oral hygiene care would be required to determine the success.

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