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Efficacy of Lateral Pedicle Graft in the Treatment of Isolated Gingival Recession Defects

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ABSTRACT: *Gingival recession is the most common mucogingival deformity and should be treated at its earliest detection. Exposed root surfaces are more likely to develop root sensitivity and root caries and pose esthetic problems. Among various procedures, laterally positioned pedicle graft (LPG) is widely used successfully to cover Miller's class-I and Class-II recession defects. The main advantages of the laterally positioned pedicle graft are that it is relatively easy and not time-consuming, it produces excellent esthetic results and no second surgical site is involved for donor harvesting. Thus the present study was undertaken to understand the efficacy of lateral pedicle grafts in various grades of gingival recession defects.*

KEY WORDS: *gingival recession, laterally positioned pedicle graft, mucogingival surgery, root coverage*

I. INTRODUCTION:

Gingival recession is defined as the displacement of the gingival margin apical to the cementoenamel junction. It implies the loss of periodontal connective tissue fibers along with root cementum and alveolar bone. The most significant factors causing gingival recession are considered to be periodontal disease and improper oral hygiene measures; along with some predisposing factors such as thin gingiva, a prominent root surface, bony dehiscences, abnormal tooth position, frenal pull, mechanical trauma caused by tooth brushing, and iatrogenic factors such as faulty restorations or uncontrolled orthodontic movement of teeth.[1]The term 'periodontal plastic surgery'(PPS), first suggested by Miller (1988), is defined as 'surgical procedures performed to prevent or correct anatomical, developmental, traumatic or plaque disease-induced defects of the gingiva, alveolar mucosa, or bone' (The American Academy of Periodontology 1996)[2]. One of the most frequent indications of PPS is the treatment of buccal gingival recessions. This treatment has mainly been justified by the patient's wish to improve the aesthetic appearance when there is an exposed root. Occasionally, there is an indication for surgical treatment when the exposed root is associated with dental hypersensitivity and/or root caries. Moreover, these defects should also be treated in situations where there is an unfavorable contour of the gingival margin that limits proper plaque control and fails to respond to adequate oral hygiene measures.A variety of periodontal plastic surgeries have been suggested for root coverage. These surgical procedures can be classified as pedicle soft tissue grafts, free soft tissue grafts or a combination of both. The pedicle graft was the first periodontal plastic surgery procedure proposed in 1956 for root coverage by Grupe and Warren[1] as a laterally repositioned full thickness flap. Pedicle grafts are based on the simple concept of moving donor tissue laterally to cover an adjacent defect. It provides sufficient esthetic result. At first it was described as the "lateral sliding flap." The procedure was then modified and named as the "laterally positioned flap". The "oblique rotational flap", the "rotation flap", and the "transpositioned flap" are modifications in incision design.[2] When the lateral movement is both mesial and distal to the defect, the flap is called a double papilla flap.[3]

II. MATERIALS AND METHODS

18 systemically healthy patients attending the Department of Periodontology, CODSH-NMC, with the chief complaint of receding gums were chosen for the study during the period of 1st January 2013 to 30th August 2013. The following criteria were included for the procedure: aged 30 years and above, otherwise healthy individuals with good oral hygiene, gingival sulcus depth of 2 mm or less and no presence of bleeding on probing. Exclusion criteria were uncontrolled diabetic mellitus patient, increased risk of bacterial endocarditis, pregnant and lactating women, smokers, patient with poor oral hygiene and conditions that contraindicate minor surgical procedure. Informed consent was taken from each patient before the surgical procedure.

A comprehensive treatment was planned, which included: phase I therapy and surgical therapy. Phase I therapy in the form of oral prophylaxis and root planing with oral hygiene instructions and chemical antimicrobial therapy in the form of 0.2% chlorhexidine gluconate as mouthwash.Baseline gingival recession

height was measured with Williams probe and grouped as group 1 (3-4mm), group 2 (5-7mm) and group 3 (>=8mm).Surgical Procedure: After local anesthesia (2% lignocaine hydrochloride with 1:80,000 epinephrine), firstly a V shaped incision was made in the gingival recession area making a wide external bevel incision on mesial aspect & internal bevel on distal aspect. Then the V shaped gingiva was removed & beveled for flap adaptation. The adjacent partial thickness pedicle flap was reflected from the donor area, leaving about 1 mm of marginal gingiva intact, the width of which was more than 1½ times the area of gingival recession. The pedicle flap was then covered over the recipient site and finger pressure was applied with a gauze piece until the graft was firmly seated. It was then carefully secured with 3-0 non- resorbable sling sutures without tension. Cut-back incision was given if it precluded stable positioning of the flap to the recipient site. Good adaptation of the flap to the underlying tissues is essential for adequate diffusion. Periodontal dressing was given thereafter.

Fig 1: Pre operative gingival recession in 31

Fig 2: Sutures placed after lateral pedicle graft

Fig 3: Periodontal dressing placed

Fig 4: Post up recession coverage

The patient was discharged with postoperative instructions and NSAIDs as medications for 3 days to avoid postoperative pain and to reduce inflammation. The patient was recalled after 7 days. The periodontal dressing along with sutures were removed and thoroughly irrigated with normal saline. The surgical site was examined for uneventful healing. 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. Again measurements were taken from the marginal gingival towards the CEJ. Oral hygiene instructions were re- instructed.The patient was monitored regularly postoperatively, to ensure good oral hygiene in the surgical area. Re-evaluation was done at 3 month follow up, during which the site was re-examined for the recession height.Statistical analysis was carried out using SPSS version 16 using Chi- square test and paired T-test wherever applicable.

III. RESULTS:

61.1% of the age group for the study was in the range of 30-45 years and the remaining 38.9% were more than 45 years. 16.7% of the 30-45 years group had loss of attachment of more than 1 mm after surgical procedure, whereas 25% of more than 45 years group had loss of attachment of more than 1mm after the procedure.(Fig. a)Gingival recession was graded according to Miller's classification.[4]Among the cases done, 50% had Miller's grade I, 33.3% had grade II and 16.7% had grade III recession.(Fig. b) When initial grades of recession was compared with recession coverage, 88.9% of group 1 had complete coverage or minimal loss of attachment and 66.6% in group 3 had complete coverage or minimal loss of attachment which was not statistically significant. (Table 2)As stated earlier, baseline gingival recession height was measured with Williams probe and grouped as group 1 (3-4mm), group 2 (5-7mm) and group 3 (>=8mm). 100% in group 1 had complete coverage or minimal loss of attachment whereas 71.5% in group 2 had complete coverage or minimal loss of attachment which was also not statistically significant. (Table 3)Results showed that out of all the cases done, the mean LOA after the surgical procedure was 0.833± 0.707 which was statistically significant. (Table 4) However LOA in 3 months follow up was seen to be 1.333± 0.485 which was not found to be statistically significant. (Table 5) This clearly indicates that statistically significant esthetic root coverage was obtained in 1 week follow up.

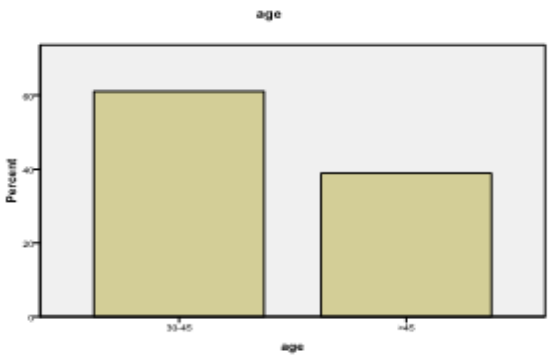

Fig. a: Frequency of age group

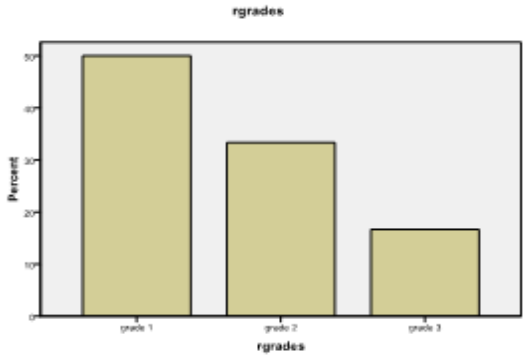

Fig. b: Frequency of grades of recession

Table 1- Association of age with recession coverage

Gingival recession grades	Loss of attachment after surgical procedure			p value*
	None	1mm	>1mm	0.663
30-45 years	36.4%	54.5%	9.1%	
>45 years	28.6%	42.9%	28.6%	

**p value from Chi- square test*

Table 2- Association of recession coverage with grades of recession

Gingival recession grades	Loss of attachment after surgical procedure			p value*
	None	1mm	>1mm	
Grade I	33.3%	55.6%	11.1%	0.944
Grade II	33.3%	50.0%	16.7%	
Grade III	33.3%	33.3%	33.3%	

**p value from Chi- square test*

Table 3- Association of recession coverage with recession height

Baseline gingival recession height	Loss of attachment after surgical procedure			p value*
	None	1mm	>1mm	
Group 1	40%	60%	0%	0.165
Group 2	28.6%	42.9%	28.6%	
Group 3	0%	0%	100%	

**p value from Chi- square test*

Table 4- Recession coverage after the surgical procedure

	Mean	Std. deviation	p value*
Baseline gingival recession	1.500	0.618	0.001
LOA after surgical procedure	0.833	0.707	

**p value from paired T-test*

Table 5- Recession coverage in 3 months follow up

	Mean	Std. deviation	p value*
Baseline gingival recession	1.500	0.618	0.187
LOA after surgical procedure	1.333	0.485	

**p value from paired T-test*

IV. DISCUSSIONS:

Laterally positioned pedicle graft, a technique which was introduced by Grupe and Warren in 1956, represents one of the first in the series of procedures of mucogingival surgery designed to cover exposed root surfaces.[1] In 1966, Grupe modified the lateral pedicle technique using submarginal incision at the donar site so that no denuded osseous surfaces would be created.[3] This technique was evaluated by many investigators (McFall, 1967[5], Smukler, 1976[6]), and the success of this root coverage procedure was found to be in the range of 69% to 72%. Other modifications of lateral pedicle grafts are given by Staffelino in 1964 who did split thinkness flap to minimize recession at donor site, Corn in 1964 did a cutback incision at the base of the flap and Knowles and Ramfjord in 1971 did a free graft to cover the donor area.[7]Indications for lateral pedicle grafts are sufficient width, length, thickness of keratinized tissue, coverage limited to 1-2 teeth, sufficient depth of vestibule and narrow mesio-distal dimension of recession. Contraindications are insufficient width, length, thickness of keratinized tissue, presence of fenestration or dehiscence at donor site, extremely protrusive teeth, deep PDL pockets, loss of interdental bone and narrow oral vestibule.The advantage of lateral pedicle graft is its simplicity, presence of only one surgical site and good vascularity of pedicle. Whereas its disadvantages are that the amount of keratinized attached gingival that is the pre requisite, probable recession at donor site, dehiscence or fenestration at donor and its limitation to only 1-2 teeth.Often times there might be cases of failure to cover the denuded surface and the reasons for that could be attributed to tension at base of distal incision, too narrow pedicle, full thickness flap to cover might lead to exposure of bone which leads to bone loss and poor stabilization & mobility of the graft.

Limitation of the present study is the number of subjects taken and lack of control group for comparisons. As such there is insufficient recent research on studies done on lateral pedicle grafts. One study by Ricci et al. presenting a comparison of connective tissue graft (CTG) and LPG showed no statistically significant differences with regard to mean recession change (CTG 2.64 mm, SD 1.82, LPF 2.47 mm, SD 1.82).[8]A study done by Verma PK showed esthetic root coverage of Miller's Class II recession with laterally positioned flap in the lower anterior region.[9]Similarly, Chopra DK et. al, did LPG for the treatment of adjacent Class-III gingival recession defect in mandibular anterior area in which root coverage was obtained with no change in the position of gingiva at the donor site.[10]Similarly, Nirwal A, et al. did a case report on frenectomy combined with a laterally displaced pedicle graft in which he gained successful coverage of the denuded root along with esthetic results. He also confirmed that the attached gingiva in midline may have a bracing effect which helps in prevention of orthodontic relapse.[11]Another study was undertaken by Martins et al. in which they had done laterally positioned flap along with subepithelial connective tissue graft for coverage of isolated gingival recession in which postoperative assessment showed complete root coverage, an increased keratinized gingival band, absence of dentin hypersensitivity, and an excellent esthetic outcome.[12]

V. CONCLUSION:

In the present study a laterally positioned flap with submarginal incision was used to cover Millers recession defects in various maxillary and mandibular anterior regions. This technique has been demonstrated to be a reliable and predictable treatment modality for obtaining root coverage in recession defects for complete or partial root coverage. However careful case selection and surgical management is critical if a successful outcome is to be achieved.

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