

*Case Report*

Full Thickness Sub Marginal Pedicle Flap in Conjunction with PRF for Root Coverage

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ABSTRACT

Root exposure as a result of gingival recession can cause hypersensitivity, root caries and compromised esthetics. Variety of techniques have been developed which provide root coverage with good predictability. Lateral pedicle flap is one such technique which has been developed with certain modifications. Adjunct use of platelet concentrates in periodontal plastic surgery has warranted their use in wound healing. Whether initial tissue thickness can provide long term stability is not known. Hence this report describes a combined approach of using a lateral pedicle flap with sub marginal incision in conjunction with PRF.

Key words: lateral pedicle, PRF, submarginal incision.

INTRODUCTION

An unsightly smile can have a profound negative impact on an individual's personality, outlook, emotions and relationships with others. Therefore the primary goal of esthetic surgery is the restoration of a naturally healthy smile and esthetic appearance. ^[1]

Root exposure occurring as a consequence of gingival recession may lead to increased sensitivity, periodontal attachment loss, compromised esthetics and root caries. ^[2] Traumatizing tooth brushing and tooth malposition are the factors most

frequently associated with this condition. Other factors include alveolar bone dehiscence, inadequate gingival dimensions, high muscle attachment and frenal pull, calculus and iatrogenic factors related to restorative and periodontal treatment procedures. ^[3]

Root coverage procedures form an important aspect of perio-esthetics. These include pedicle and free soft tissue graft, use of GTR membranes. Grupe and Warren et al, proposed the technique of laterally repositioned flap operation for coverage of isolated recession. Guinard and Caffese

reported an average of 1 mm of post operative recession on the adjacent donor site. To overcome this disadvantage, Grupe reported a modified technique to preserve the marginal gingival by making a sub marginal incision on donor site. [4] Recent advances in root coverage procedures include the adjunctive use of enamel matrix derivative, [5] acellular dermal matrix graft, platelet rich plasma (PRP), [2] platelet rich fibrin (PRF) [6] for better enhancement and predictability.

An important risk factor for gingival recession may be a thin gingival biotype where in a delicate marginal tissue covers a non vascularised root surface. The sequelae of which is a nonkeratinised tissue not firmly bound to the underlying periosteum with no sufficient strength to withstand mechanical forces of toothbrush trauma and mastication. [7] Hence special care must be taken when treatment planning for cases with a thin gingival biotype. According to Weisgold, individuals with a thin, scalloped gingiva demonstrated a greater prevalence of recession. [8] In order to prevent recurrent recession, altering gingival dimensions width and thickness might be of advantage. [9]

Taking this aspect into consideration, as well as to evaluate the effectiveness of PRF membrane, a case has been reported using lateral pedicle flap with submarginal incision for the coverage of exposed root.

CASE REPORT

A 20 year old female dental student grew conscious about her receding gum line in relation to upper right canine and sought treatment for it. According to her, this condition had persisted since 2 years and the recession was progressing. The patient gave history of toothbrush trauma and was unaware of correct brushing technique. On examination a recession of 3 mm was noted on right canine measured from gingival

margin to CEJ (Fig.1) and 3 mm mesiodistally. It was categorized as Miller's class-I gingival recession (Fig.2). The gingival appeared to be of thin biotype, less than 1mm in thickness.

The patient underwent scaling procedure and was given oral hygiene instructions regarding brushing technique with recall after two weeks for surgical intervention. At the recall visit, a brief medical history was taken which revealed no contraindications for periodontal surgery. Blood investigations showed all parameters to be within normal limits. The surgical procedure was described in detail to the patient and informed consent obtained.

After administration of local anesthesia, incision design was outlined with an indelible pencil (Fig.3). With the help of a no.15 scalpel blade a V- shaped incision was given round the denuded root with deepithelialization and exposure of connective tissue. Taking into consideration the adequacy of width of attached gingiva in the premolar area, a sub marginal incision extending from distal of canine to mesial aspect of second premolar was placed as described in the modification by Grupe et al (Fig-4). The vertical incision distally was extend was upto or beyond mucogingival junction to permit mobility of the flap. The base was wider to permit vascular supply. A sulcular incision extending from the V shaped incision was made with the same 15 no. blade leaving the marginal gingiva. The flap was cautiously trimmed to preserve the interproximal papilla. A full thickness flap was elevated with blunt dissection (Fig.5) which revealed a hidden recession of 6mm (Fig.6). To permit perfect positioning of the flap a cut back or releasing incision was given. Meanwhile PRF preparation was carried out with centrifuge as described by Choukron et al (Fig.7). PRF gel obtained (Fig.8). A membrane was prepared by pressing it against two gauze pieces and

immediately placed on the denuded root surface which was previously biomodified with tetracycline solution (Fig.9). The pedicle flap was positioned 1-2mm coronal to CEJ and suturing was done using 5-0 ethicon suture. A sling was placed that held the interproximal against the neck of the tooth (Fig.10). A tin foil was placed (Fig. 11) and periodontal dressing covered the flap (Fig.12). Post operative instructions included use of antibiotics, analgesics and discontinuation of brushing at the surgical site for 4 weeks. Use of chlorhexidine mouth

rinse was advised. Sutures were removed at the end of two weeks and uneventful healing was observed at the end of three weeks. After 4 weeks gentle brushing was advised. Total root coverage was observed at the end of two months (Fig.13). Post operative view at the end of 6 months(Fig.14). The patient was followed upto 8 months (Fig.15). An increase in the tissue thickness was noted. There was gain in attachment as noted by resistance offered by the tissue towards probing. Post operative view of the tissue at the end of 8 months.



Fig1.Apparent recession 3mm preoperatively. Fig2.Preoperative mesiodistal width3.5mm. Fig3. Outline of incision design. Fig4.After placement of submarginal incision

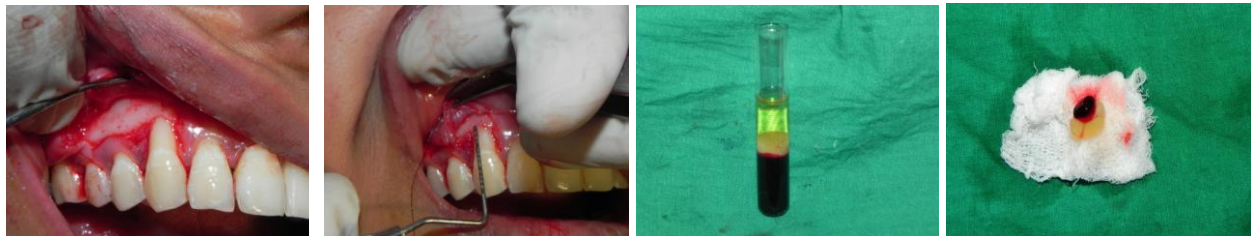


Fig5.After reflection of full thickness flap. Fig6.Hidden recession of 6mm. Fig7. PRF showing three layers. Fig8. PRF gel obtained



Fig9.PRF gel placed on conditioned root. Fig10.Flap laterally displaced and sutured. Fig11.Placement of tin foil. Fig12.Placement of periodontal pack



Fig13.Root coverage obtained at the end of two months. Fig14. At the end of 6 months. Fig15.At the end of 8 months

DISCUSSION

Gingival biotype is the greatest cause of concern, particularly affecting the outcomes of periodontal therapy, root coverage procedures, and implant placement. Different tissue biotypes respond differently to inflammation and to surgical and restorative treatment. Consequently, it is crucial to identify tissue biotype before treatment. In 1969, Ochsenein & Ross indicated that there were 2 main types of gingival anatomy- flat and highly scalloped. Maxillary canines and mandibular first premolars have the thinnest gingiva (0.7-0.9 mm), with a relatively high incidence of gingival recession. [8] According to Wennstrom (1985) stated a thin marginal tissue in particular absence of underlying alveolar bone will be at greater risk of recession since the plaque induced inflammation lesion may occupy and cause the entire connective tissue portion of the gingiva.

Surgical procedures used in treatment of recession are classified as pedicle soft tissue grafts and free soft tissue grafts. Lateral sliding flap is one of the pedicle flap advocated for root coverage. It can be full thickness, partial thickness, periosteal stimulated or a combination of partial and full thickness. The advantages of laterally repositioned flap over other flap procedure are the presence of its own blood supply after the transfer of the graft and high survival rate on the roots.

Use of PRF, a new platelet concentrate concept has been a trend in recent years. Its production protocol attempts to accumulate platelets and released cytokines in a fibrin clot. This clot when pressed between two gauzes, becomes a strong membrane, which in due course gets remodeled in a way natural to blood clot, with intimate assembly of cytokines, glycanic chains and structural glycoproteins

enmeshed within a slowly polymerized fibrin network.

PRF has been used successfully in oral and maxillofacial, ear nose and throat and plastic surgery. [10] It can be regarded as a dense fibrin biomaterial with biomechanical properties. [11] Its role in bone generation and accelerated bone regeneration has been well documented. [12] Many periodontal plastic and regenerative techniques have also advocated the use of PRF for reconstruction of papilla [13] and in tissue engineering techniques. [14] Low cost and ease of procedure are the prime advantages.

An important factor of critical importance is the flap thickness. The initial thickness of the flap and the type of dissection may alter the connective tissue microcirculation and the interposition of PRF may limit the collateral circulation essential for a thin flap to revascularise. However an increased thickness at the gingival margin at the test site was a statistically significant factor in a study by Wennstrom and Zuchelli in 1996. [15]

This was similar in our case. A thin biotype increases the likelihood of recession when combined with traumatic tooth brushing habit. Thick gingival tissue is said to be associated with more resistance to trauma and promotes creeping attachment. However a study by Hwang D and Wang HL in 2006 in a systematic review revealed a positive association exists between weighted flap thickness and complete root coverage with connective tissue and GTR membranes but failed to establish in coronally advanced flap procedure.

In the present case report at the end of 6 and 8 months there was gain in attachment level along with thick tissue. This may be the result of periodontal ligament fibroblast proliferation under the influence of biomodification as well as influence of growth factors or both. This

case reports with increase in thickness of gingival with full coverage of the root seen with submarginal lateral pedicle flap with adjunct use of PRF membrane. However, long term stability of this tissue needs to be evaluated. [16]

CONCLUSION

This case report describes root coverage procedure using lateral pedicle flap technique with submarginal incision along with placement of PRF membrane. This can be used to restore the functional properties of gingival. This is a short term observation. More and more randomized clinical trials with long term follow up are warranted to prove PRF's impact on soft tissue as well as hard tissue reconstruction.

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