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Case Report

ROOT COVERAGE USING DOUBLE PAPILLA REPOSITIONED FLAP WITH CONCENTRATED GROWTH FACTOR

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ABSTRACT

Over the years, several surgical techniques have been proposed to treat various gingival recession defects. In cases of isolated recession defects, the most commonly employed techniques are the coronally advanced flap, laterally repositioned flap, free gingival autografts and pedicle grafts. Among the pedicle grafts, the choice of using a double papilla repositioned flap is considered ideal when the tissue at the adjacent donor site is adequate. The use of wide papillae on either side of the defect, helps in precise flap approximation and dual blood supply. The use of platelet concentrates as an adjunct to various techniques such as double papillae for root coverage may aid in better tissue healing and repair. One such platelet concentrate discovered recently is the "concentrated growth factor" (CGF). This case report demonstrates the use of a double papilla repositioned flap technique along with CGF, that achieved optimal results in treating an isolated Miller's class I gingival recession defect.

INTRODUCTION

Numerous surgical techniques that include pedicle and free soft tissue grafting procedures, have been applied to correct gingival recession defects with varying degrees of success. Pedicle graft procedures, depending on their direction of transfer, may be broadly classified as: (i) rotational flaps (such as lateral sliding flaps or double papilla flaps) and (ii) advanced flaps with or without rotation or lateral movement.[1] Double papilla flap procedure was first described by Wainberg as the double lateral repositioned flap and was later refined by Cohen and Ross as the double-papilla flap.[2] The advantages of the double-papilla flap technique such as reduced hypersensitivity, no need for second surgical site, good color match, dual blood supply and high mean percentage of root coverage, make it an ideal choice for treating isolated recession defects.

Relatively recently, the advancement in root coverage procedures is the use of platelet concentrates like platelet-rich plasma (PRP) or platelet-rich fibrin (PRF) as an adjunctive agent to accelerate wound healing and repair. One such platelet concentrate is the concentrated growth factor (CGF), that was first developed by Sohn *et al* in 2009.[3] CGF is known to contain a larger, denser and richer fibrin matrix of growth factors (GFs) and may have a better regenerative capacity than the other platelet concentrates.

The double-papilla flap technique has been used in conjunction with connective tissue graft.[4,5] However, the use of CGF along with double-papilla flap is not yet known in literature. Therefore, this case report demonstrates the use of double papilla repositioned flap technique along with CGF as an adjunct in treating an isolated Miller's class I gingival recession defect.

CASE REPORT

A thirty-five year old systemically healthy female patient reported to the department of periodontology with a chief complaint of sensitivity in the lower back tooth region for the past 3 months. A thorough case history was taken. Intra-oral examination revealed Miller's Class I recession in the mandibular right first premolar tooth (tooth number: 44) [Figure 1]. The pre-operative clinical parameters such as recession depth (RD), probing depth (PD) and clinical attachment level (CAL) were recorded [Table 1]. An informed consent and routine blood investigation reports were obtained from the patient.

Treatment plan: Based on the patient's clinical periodontal evaluation and history, thorough scaling and root planing was done one-week prior to the surgical procedure.

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Figure 1 Pre-operative clinical view of 44

The double-papilla flap technique was considered as the appropriate choice of treatment due to the presence of adequate gingiva at the adjacent donor site and wide papillae on either side of the affected tooth.

Table 1 Pre-operative clinical parameters irt. 44

PARAMETERS	44
Recession Depth (RD) (in mm)	3
Probing depth (PD) (in mm)	2
Clinical attachment level (CAL) (in mm)	5

Concentrated Growth Factor (CGF) preparation

Before commencing the surgery, CGF was prepared. Intravenous blood was collected in two 10-ml glass-coated plastic tubes without anticoagulant solutions that were then immediately centrifuged using a CGF centrifuge machine with a one-step centrifugation protocol 30sec -acceleration, 2min - 2700 rpm, 4min - 2400 rpm, 4min - 2700 rpm, 3min - 3000 rpm, 36sec – deceleration and stop.[6] At the end of the centrifugation, there were four phases or layers namely 1) the upper serum layer 2) the second fibrin buffy coat layer 3) the third layer with growth factors and 4) the lower layer with red blood cells (RBCs). [Figure: 2]

Figure 2 Procurement of concentrated growth factor

Surgical procedure

The mandibular right first premolar tooth was anaesthetized using buccal infiltration containing 2% Lidocaine and 1:80,000 adrenaline. Using a 15-blade, two horizontal incisions were given along the cement-enamel junction (CEJ) of 44, making sure that the triangular shape of the interdental papillae remained undisturbed. Two vertical releasing incisions were then made obliquely at the line angles of the adjacent teeth and were extended beyond the mucogingival junction [Figure: 3]. Due to thin gingival biotype, a full-thickness mucoperiosteal flap was elevated [Figure: 4].

Figure 3 Incisions given

Figure 4 Flap reflected

The CGF clot was removed from the tube and separated from the RBC layer using surgical scissors. The CGF was then compressed using a gauze piece and a 1 mm thick membrane was obtained which was immediately placed over the exposed root surface of 44 [Figure: 5]. The mesial and the distal pedicles were sutured together in the midline, placed over the CGF, and secured to the interdental papillae [Figure: 6]. The vertical releasing incisions were sutured subsequently. Suturing was done 5-0 Vicryl absorbable sutures.

Figure 5 CGF placed

Figure 6 Suturing done

Periodontal dressing was given over the surgical site and the patient was informed not to brush the surgical site until the sutures were removed. The patient was instructed to rinse with 0.2% of chlorhexidine mouthwash twice daily for 3 weeks. Amoxicillin 500mg 3 times a day for 5 days and analgesic (Aceclofenac 100mg + paracetamol 500mg) 2 times a day for 3 days was prescribed. The patient was recalled two weeks after the surgical procedure and the sutures were removed [Figure: 7]. Adequate healing was noted. The patient was followed-up for a period of 3 months.

Figure 7 Two-weeks post-operative view

Figure 8 Three months post-operative view

Outcome

The clinical parameters were re-evaluated 3 months after surgery [Table: 2]. Complete root coverage was achieved. The recession depth had reduced from 3mm to 0mm. The probing depth remained the same and there was a gain in the CAL. Good color match and no scar formation was evident. The patient was esthetically satisfied and reported with reduced sensitivity after the surgical procedure.

Table 2 Post-operative clinical parameters irt. 44

Parameters	44
Recession Depth (RD) (in mm)	0
Probing depth (PD) (in mm)	2
Clinical attachment level (CAL) (in mm)	2

DISCUSSION

Over the past few decades, with the advent of various treatment options, proper case selection and choosing the appropriate technique has made root coverage more predictable. Various surgical techniques have been employed to treat isolated recession defects that include the coronally advanced flap, laterally repositioned flap, free gingival autografts and pedicle grafts. Among the pedicle grafts, the double-papilla flap technique has undergone major evolution.

The partial thickness double papilla pedicle graft technique was first created by Cohen and Ross.[2] Later, Hall reported that double pedicle graft had very low predictability in most cases.[7] The 1989 World Workshop in clinical Periodontics concluded that the double papilla pedicle had very limited usefulness.[8] Additionally, its weaknesses included its poor predictability and the technical skills required to perform the procedure. Nelson then developed a technique that combined a free connective tissue graft with a full thickness double papilla graft.[9] Harris further proposed the use of a partial thickness double pedicle flap rather than a full thickness one overlying a free connective tissue graft as partial thickness flap allows the connective tissue graft to receive vascular supply both from the recipient bed and from the flap overlying it.[10] Although the double-papilla flap is technique sensitive with a possibility of recession at the donor site, its advantages include good color match, dual blood supply, predictable root coverage and decreased hypersensitivity.

Nevertheless, few factors have to be considered when opting for this technique. Firstly, the interdental papillae should be thick with an absolutely healthy periodontium adjacent to the affected tooth. Secondly, this technique cannot be applied to treat multiple adjacent recessions.[11]

Different adjuncts have been used along with the double-papilla technique, but to the best of our knowledge, this is the first report to combine the double-papilla flap technique with the use of CGF. This case report showed significant reduction in the recession depth and CAL gain. Furthermore, it is well known that CGF increases tissue vascularization and promotes proliferation of fibroblasts, thereby enhancing healing of the soft tissue.[6] Therefore, the use of CGF may have played an essential role in achieving optimal results in terms of tissue repair. However, future histological examination of CGF would be required to prove its long-term predictability.

CONCLUSION

The present case report showed optimal results in terms of root coverage, color match and resolution of hypersensitivity. In addition, the use of CGF enhanced healing of the soft tissue. Nevertheless, further studies adopting this technique with the use of CGF and other platelet concentrates in a large sample size and longer follow ups are required to prove the efficacy and long-term stability of the root coverage procedure.

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