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Recession coverage with concentrated growth factor membrane: A case report

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Abstract
Treatment of gingival recession is challenging procedure to clinicians. Various surgical procedures with various materials has been used to treat gingival recession like coronally advanced flap, pedicle graft, free gingival graft, connective tissue graft, guided tissue regeneration technique, pouch and tunnel technique etc. Platelet concentrates are also used for long time. This article presents a case report on management of gingival recession in anterior maxilla with coronally advanced technique with concentrated growth factor, 2nd generation platelet concentrate.

Keywords: gingival recession, platelet concentrate, concentrated growth factors

Introduction

Gingival recession (GR) is defined as apical shift of the gingival margin relative to the cemento-enamel junction (CEJ). Gingival recession occurs because of anatomical, pathological, and traumatic factors (1). The presence of GR may be associated with dentin hypersensitivity, root cavity, non-carious cervical lesions, and is often aesthetically unacceptable for patients. Numerous periodontal plastic surgery techniques have been suggested for treating GRs. The connective tissue graft (CTG) with coronally advanced flap (CAF) procedure is the accepted gold standard for providing root coverage (RC), obtaining keratinized tissue gain and achieving predictable treatment outcomes (2). However, this technique has several disadvantages, including insufficient donor tissue thickness, additional risk due to the presence of a second surgical site, extension of surgical procedure time, and presence of a palatal neurovascular bundle in the proximity of the premolar–molar area, and limited graft size from the donor site with multiple defects or large recession areas. Furthermore, increased bleeding and pain complaints have been observed postoperatively. Therefore, alternative methods are used to treat GRs (3). Platelet concentrates (PCs) are used in the field of periodontology to provide key cells and growth factors to advance healing and promote regeneration (4). Concentrated growth factor (CGF), which was first introduced by Sacco, has emerged as a potential regenerative material. Rather than being obtained by constant speed centrifugation as in platelet-rich fibrin (PRF), CGF is acquired using a special device at varying speed,the rotational speed of the centrifuge machine varies between 2400 and 3000 rpm (5).The variability of the rotation speed during centrifugation results in a fibrin matrix that is larger, more intensive, and includes more growth factors than PRF (6). Some studies have reported higher tensile strength and higher growth factors for CGF when compared to PRF (7). In addition, CGF has also been characterized as less enzymatically degradable than PRF and as having a longer growth factor release time (8). Currently, CGF is widely applied in a variety of dental surgeries, including the sinus lifts, peri-implantitis, periodontal regeneration, and root coverage (9). Therefore, this case report sought to evaluate the clinical efficacy of CGF combined with CAF in the treatment of GR. It also sought to assess and compare postoperative pain and soft tissue healing.

Case report

A twenty three year's male visited to Department of Periodontics with chief complain of sensitivity in upper right front tooth region with un-esthetic smile. Patient had no smoking habit, and reported no relevant medical and dental history. Intra-oral clinical examination revealed Miller's class I defect in maxillary right canine (13). Recession depth (RD) and recession width (RW), keratinized tissue thickness (KTT) was measured by UNC-15 periodontal probe and k file and the measurement was 3mm, 5mm and 1mm (Fig1, Fig2 and Fig3). Mild plaque and calculus were present. Occlusion was found normal, i.e. non-traumatic. Intraoral peri-apical radiographs showed no interdental bone loss. The patient underwent basic non-surgical periodontal therapy including scaling and root planing, and oral hygiene instructions were given. After four weeks of phase 1 therapy, recession coverage with coronally advanced flap and CGF was planned. Signed informed consent was obtained from the patient after discussion of the procedure that would be performed, and all possible complications were thoroughly explained. Under aseptic conditions, local anesthesia was given, following standard technique. First, a measurement of 3mm from tip of both adjacent papilla vertically and 3mm from clinical CEJ to adjacent interdental papilla was done. Then, a horizontal

incision was given from clinical CEJ to adjacent interdental papilla of 3mm width. Then vertical access incision was made using blade no. 15c, extend beyond mucogingival junction (MGJ) (Fig.4). Then partial thickness flap well beyond the muco-gingival margin for mobilizing marginal tissue and allowing its tension-free coronal repositioning. Full thickness flap raised only 3mm of recession depth in partial –full-partial manner (Fig5). Then root surface planning and root conditioning done (Figure 6). Then blood taken from patient and centrifuge according to manufacturer instruction and CGF membrane prepared (Figure 7,8). CGF membrane placed in the recession area and the mucogingival tissue was then coronally advanced by the aid of a suture at a point approximately 2-3 mm apical to the existing respective gingival margin (Fig.9,10). Postoperative instruction was given along with analgesic and antibiotic coverage. Suture was removed after two weeks and healing was found satisfactory (Fig.11). The patient was kept under maintenance phase and recalled after at one month, six (6) months and twelve (12) months. There was no improvement in recession depth and KTT but post-operative pain was reduced and healing was satisfactory.

Fig 1: Recession depth-3mm

Fig 2: Recession width

Fig 3: Keratinized tissue thickness

Fig 4: Horizontal and vertical incisions

Fig 5: partial-full-partial flap reflection

Fig 6: Root conditioning with EDTA

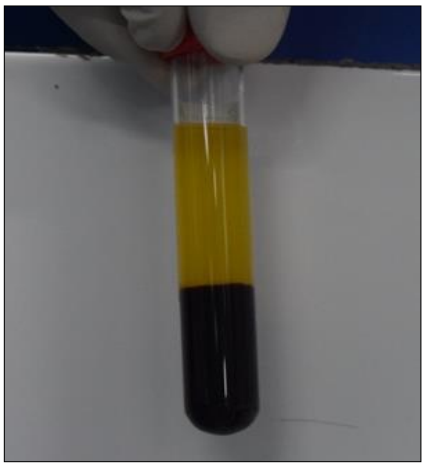

Fig 7: Blood centrifugation

Fig 8: CGF membrane

Fig 9: CGF membrane placed

Fig 10: Single sling suture given

Fig 11: 10 days post-operative view

Fig 12: 1 year follow up

Discussion

The effect of CGF on the results of root coverage surgery was not satisfactory which was accordance the result of Moraschini *et al* (2016) [10] where PC treatments did not improve treatment results regarding RC, KTW, or CAL (10). Recently, the changes in the centrifugation systems used for PC and the acquisition protocols have been believed to possibly change the properties of the fibrin structure and affect the clinical results. But according to Akcan *et al* (2020) [11] multiple gingival recessions treated with CGF was 52.6% recession coverage (11).

In this case report these result may be due to thin periodontal phenotype of the patient. Patients with a thin biotype are more vulnerable to connective tissue loss and epithelial damage, thus, they need special atraumatic treatment and oral hygiene techniques (12). Thin gingival biotypes are less stable, and the occurrence of the papillary and marginal recession is more common in them (13). A thin periodontal biotype is associated with a delicate and highly scalloped osseous gingival contour in which defects such as fenestrations and dehiscence are frequently encountered (14). But postoperative pain was reduced and

wound healing was satisfactory in this study which was according to Cader *et al* (2020) (15).

Conclusion

Within the limits of this 12-month follow-up study, CGF did not improve clinical outcomes, especially primary-outcome that is recession coverage (RC). This method had a more positive effect only on postoperative pain and wound healing. This finding is not enough to show the correct clinical effect of CGF. Future studies should have higher standardization with large patient populations, are required for establishment of benefits of CGF in treatment gingival recession defects.

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