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Unlocking the transformative potential of Free Gingival Grafts: A Case Series

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Abstract

Free gingival grafts have been employed in mucogingival surgeries primarily in gaining the width of keratinized tissue around teeth as well as to cover denuded root surfaces. However, there are a few drawbacks to the same, including bulky look, esthetic mismatch, and improper establishment of the muco-gingival junction. Recently, some changes have been suggested to lessen some of the negative effects of free gingival grafts such as gingivoplasty by means of diode laser as well as scalpel. Miller's Class I/II/III gingival recession was present in three cases, and each case had a unique alteration. In this case series all three cases, satisfactory root coverage and gain in the keratinized tissue width were achieved.

Keywords: Free gingival graft, Modified apical repositioning flap, Accordion technique, Periosteal Pedicle.

Introduction

The apical migration of marginal gingiva is what causes impaired esthetics, dentinal hypersensitivity, and/or caries. There are several methods for treating gingival recession, including free gingival graft [FGG] and subepithelial connective tissue grafts, pedicled flaps. [1] Bjorn first provided a description of FGG in 1963.[2] Nabers was the one who first proposed the term FGG for recession coverage in 1966. [3] Since then, FGGs have also been utilized to expand the width and thickness of attached gingiva in addition to covering denuded root surfaces. High predictability and relative ease of method are benefits of employing a FGG. However, the typical FGG has a number of built-in drawbacks, including an unaesthetic appearance, bulkiness and increased morbidity.[4]

Recently, several modifications have been proposed to overcome the limitations of FGG. These include Accordion technique and periosteal pedicle with FGG.

Hence, this manuscript explores the above-mentioned recent modifications of FGG and its clinical applicability.

Case Reports

Case 1

21 years old female reported with the complaint of receding gums and sensitivity to cold in lower front tooth region and the condition had been gradually worsening since one year. Pt underwent Fixed orthodontic treatment 1 yr back. Clinical and radiographic examination revealed Miller's class II gingival recession wrt 31. Labial vestibule was shallow and aberrant labial frenal attachment was present with inadequate width of attached gingiva wrt 31(Fig1a). Considering this, the treatment plan formulated was free gingival graft.

After administering adequate LA horizontal incision was placed with 15c No. blade at the level of mucogingival junction. Blade was held parallel to the alveolar process extending to the mesial and distal line angles of one adjacent tooth on each side of the defect. (Fig 1b) De-epithelialisation of gingiva coronal to the incision line was also carried out, which was followed by sharp supraperiosteal dissection of muscle fibres and connective tissue fibres up to the desired vestibular depth. Mesiodistal and apicocoronal dimensions of the recipient bed were recorded and sterile tin foil was adapted to the recipient bed as a surgical template for determining the graft dimension. FGG was harvested from palate distal to the 1st premolar. Excessive fatty and glandular tissue was trimmed with the blade and uniform thickness of the graft was obtained. After doing final shaping of the graft, it was then adapted on to the prepared recipient bed and was secured by using 1 circumferential suture, 1 interdental concavity suture and 1 horizontal stretch suture (Holbrook ansochsenbein suture) using monofilament non-resorbable 6-0 prolene. (Fig 1d). Pre fabricated acrylic stent was used to protect the donor site. The pt was recalled frequently for a period of 6 months and could maintain the complete root coverage.(Fig 1f)

Figure 1: (a) Pre-op, (b) Horizontal partial thickness incision, (c) Graft Harvesting,(d) Graft Adaptation (e) 6 mo post-op (f) After Laser Gingivoplasty

Case 2

37 years old female reported with the chief complaint of receding gums and inability to clean lower front teeth. Clinical and radiographic examination revealed Miller's class III gingival recession wrt 31 and 41. Labial vestibule was shallow with inadequate width of attached gingiva wrt 31 and 41(Fig 2a). Accordion technique of free gingival graft was utilised since the defect measured 20mm in mesiodistal dimension to effectively cover the defect. Horizontal incision was given extending 1 and half teeth mesial and distal to the defect. Supraperiosteal dissection of fibers was carried out Followed by placement of sterile tin foil for graft size determination(Fig 2b). Graft was harvested from rt side of the palate(

Fig 2c). After obtaining the graft the alternate slit incisions on the opposite sides of the graft were made to achieve the graft expansion by altering the configuration of the tissue(Fig 2d). As we can se the obtained graft dimension was around 15mm and after slit insisions we were able to achieve expanded graft till 22mm. Graft was secured using two interrupted loop sutures on mesial and distal side and 2 circumferential sutures(Fig 2e). 3 months post op examination revealed uneventful graft healing with gain in the keratinized tissue width(Fig 2f).

Figure 2. (a) Pre-op, (b) Horizontal partial thickness incision, (c) Harvesting FGG, (d) Alternate vertical slit incisions, (e) Graft adaptation, (f) 3 mo post-op

Case 3

34 Years old female reported with the complaint of receding gums and sensitivity to cold in lower front tooth region since past 3 months. Clinical and radiographic examination revealed Miller's class II gingival recession wrt 41(Fig 3a). Labial vestibule was shallow and with aberrant frenal pull and inadequate width of attached gingiva wrt 41. Considering this, the treatment plan formulated was periosteal pedicle with free gingival graft.

After achieving adequate LA one horizontal incision was given from mesal line angle of 41 to distal line angle of 31. One horizontal incision was made apically to the target teeth's exposed root area at a distance equivalent to the height of the exposed root surface. Two slightly divergent incisions were added, going from the ends of this incision in a coronal orientation. Consequently, the connective tissue pedicle flap was gently separated from the periosteum and repositioned upward after being carefully drawn out(Fig 3b). Graft of desired dimension was harvested from Rt side of the palate.(Fig 3c). Graft thickness was 1.5 mm. Graft was secured on to recipient bed with 1 interdental concavity suture, 1 circumferential suture and 2 interrupted sutures(Fig 3e). 6 months post op revealed well uptake of the graft with absence of frenal pull and increase in width of keratinized tissue(Fig 3f).

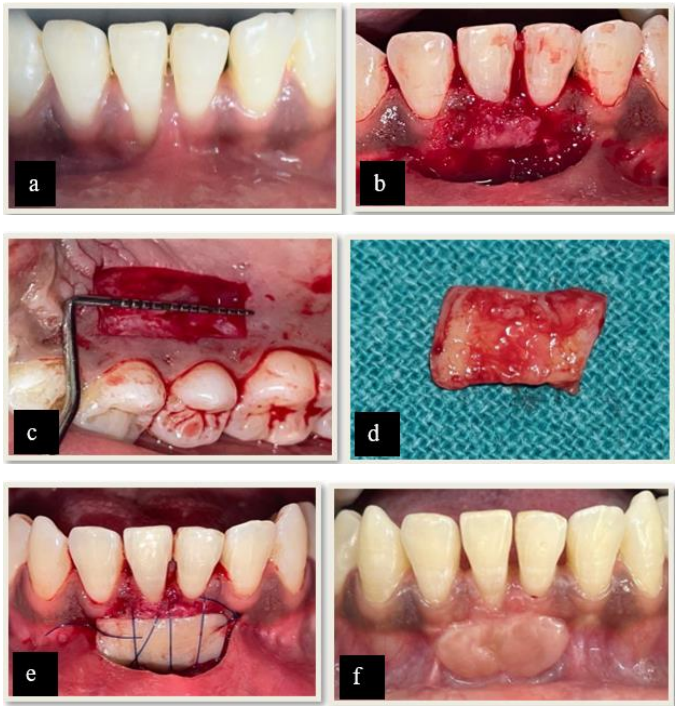

Figure 3. (a) Pre-op, (b) Horizontal partial thickness incision with periosteal pedicle (c) Harvesting FGG, (d) Harvested FGG, (e) Graft adaptation, (f) 6 mo post-op

Discussion

The width of Attached gingiva in clinical measures is the distance between the mucogingival junction and the projection on the exterior surface of the bottom of the sulcus. [5] To maintain healthy gingival tissue, a minimum of 2 mm of keratinized tissu width is required out of which 1 mm should be the attached gingiva.[6] There are many methods that can be used to increase width of attached gingiva, like free gingival grafts, connective tissue grafts, [2] and [8] and apically displaced flap. Modified apically repositioned flap (MARF) uses only a single horizontal incision and no vertical releasing incisions to achieve flap mobilization. [9] In all the cases described in this case series the Modified apically repositioned flap was done in combination with the FGG.

Changing the configuration of the donor tissue expansion of the conventional graft size by 60 % was achieved by placing alternate incisions in opposite sides as done in our second case . This lead to reduced donor site morbidity. This technique was used in wider mesiodistal and deep apicocoronal recipient bed preparation. Significant amount of gain in the attached gingiva vestibular depth was achhieved and patient was able to place her toothbrush into lower anterior teeth and could effectively maintain her oral hygiene. [10]

Periosteal pedicle graft utilizes the osteogenic potential of the periosteum which is due to its highly vascular nature, presence of fibroblasts, osteoblasts, and stem cells in our case 4 the periosteal pedicle was used along with FGG for predictable outcome by utilizing the osteogenic potential of the periosteum.[11]

The main advantages of MARF in combination with FMG is that it increases width of attached gingiva as well as vestibular depth. Current study shows long term results of combination of two techniques which are not reported much in literature. Using this combination in Miller's Class III and Class IV recession can give better and predictable results.

Conclusion

Lack of adequate keratinized gingiva is frequently linked to increased plaque accumulation, irritation of the gingiva, dentinal hypersensitivity, bleeding on probing, progressive marginal tissue recession and unpleasant look. The combination of modified apically repositioned flap with FGG along with modifications offers good clinical outcome in terms of increasing vestibular depth as well as width of attached gingiva in one surgery. The predictable increase in the apicocoronal gingival dimension by combination of modified apically repositioned flap and FGG with stable results over long period of time and offers considerable advantage over other mucogingival surgical techniques. Hence this surgical approach should definitely be used for long and sustainable results.

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