

Clinical comparison of conventional free gingival graft and its modification for the treatment of gingival recession defects. A case study

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ABSTRACT

Gingival recession is a multifaceted condition resulting in root exposure which leads to plaque retention, poor esthetics, sensitivity, root caries, and tooth loss. Treatment of gingival recession is essential to rectify the esthetic and functional deficiencies of the patient and to combat further periodontal destruction. However, treating these cases is quite challenging. Multiple approaches have been used to replace lost, damaged or diseased gingival tissues, but there are certain limitations of these techniques. Therefore it requires constant modifications of the prevalent treatment strategies. The objective of this study was to clinically compare the conventional free gingival graft (FGG) and its modification, Partly epithelized free gingival graft (PE-FGG) for the treatment of gingival recession defects. Results showed better color match, good esthetics, greater root coverage and diminished sensitivity on subjective evaluation in PE-FGG technique after 6 months. Thus, it may be considered as a reliable modality for root coverage in future.

Keywords: Free gingival graft, Gingival recession, Root coverage

INTRODUCTION

Gingival recession of the buccal surface of teeth is a frequent occurrence in patients with high standards of oral hygiene, affecting single or multiple root surfaces at all teeth types^[1]. The treatment of gingival recession is a common query from patients for its potential impact on both aesthetics and dentine hypersensitivity^[2]. In the past decade, the desire for cosmetic dentistry has increased tremendously. Periodontal plastic surgery procedures address these esthetic and functional demands and have become an integral part of the periodontal treatment. Free gingival graft is one of the most common techniques used for gingival recession in areas of inadequate attached gingiva mainly in the mandibular anterior region^[3].

FGGs were initially described by Bjorn, in 1963^[4]. The term FGG was first suggested by Nabers^[5]. The process involved in the healing of this type of gingival graft was further described by the extensive work of Drs. Sullivan and Atkins (oral presentation 1967, in print 1968)^[6]. Originally, the indications for use of this technique were the most varied. Nowadays, it sums up to a just a few.

The advantages of using an FGG technique are high predictability and relative ease of technique. However, there are few limitations of the same such as poor aesthetic appearance due to unsatisfactory chromatic, texture, tissue integration, bulky appearance and apical disalignment of alveolar mucosa^[7]. Several modifications have recently been proposed to minimize some of the unfavorable aspects of free gingival grafts^[6,8,9,10]. Among those modifications, one is proposed by Dr. Cortellini and colleagues (2012)^[8] that seems to overcome most of the limitations of free gingival grafts.

Therefore, the following manuscript reports clinical comparison between conventional FGG and its modified technique, the partly epithelized free gingival graft (PE-FGG) for the treatment of gingival recession defects.

CASE 1

A 30 yrs old healthy female patient reported with a chief complaint of sensitivity in mandibular anterior teeth. On clinical examination, Patient had a Miller's class II gingival recession in the mandibular anterior teeth [Figure 1a]. A minimal amount of attached gingiva was observed. Considering this, PE-FGG was considered for this patient.



Fig 1. PE-FGG Technique (a) Preoperative view of recession, (b) Surgical site prepared, (c) Placement of graft, (d) Postoperative view of recession after 6 months

CASE 2

A 23-year-old healthy female patient reported with a chief complaint of sensitivity and progressive downward shifting of gums in the lower anterior teeth. On examination, the patient had Miller's Class II gingival recession. A minimal amount of attached gingiva was observed [Figure 2a]. Free gingival graft (FGG) technique was done in this patient.



Fig 2. FGG Technique (a) Preoperative view of recession, (b) Surgical site prepared, (c) Placement of graft, (d) Postoperative view of recession after 6 months

PRE SURGICAL PREPARATIONS

The compliance of the patients were sought. Patients were motivated and educated. Initial therapy consisted predominantly of oral hygiene instructions in both patients. Inappropriate or faulty oral hygiene maintenance techniques were rectified. Scaling and root planing was done prior to surgical therapy. Any existing trauma from occlusion was eliminated.

Surgical procedure

2% lignocaine hydrochloride with 1:80,000 adrenaline, was infiltrated locally to anesthetize the surgical site. The exposed root surfaces were gently debrided and planed with curettes from the CEJ to the intracrevicular space in both the patients. In PE-FGG technique [Figure 1], a horizontal partial thickness incision was placed at the mucogingival junction to dissect the alveolar mucosa from the keratinized tissue. The alveolar mucosa was dissected from the underlying periosteum [Figure 1b]. The keratinized tissue coronal to the first incision and neighbouring the recession was then de-epithelized to expose the underlying connective tissue and create a trapezoidal recipient bed.

The graft was harvested from palate extending from the distal aspect of first premolar to the mesial aspect of first molar. The FGG was epithelized only in the coronal part and apical extent of graft was de-epithelized to expose the connective tissue. The dimension of the epithelized portion was calculated from the cemento-enamel junction (CEJ) to MGJ. The rest of the recession was covered with the connective tissue part of the PE-FGG. The de-epithelized apical part of the graft was enveloped between the dissected alveolar mucosa and the periosteum of the recipient bed and extended 2-3 mm apical to the bone dehiscence. The graft, thus, obtained was contoured, adapted, and sutured on to the recipient bed [Figure 1c].

Interrupted sutures were positioned to stabilize the graft. The palatal window was sutured and the exposed connective tissue protected with a periodontal dressing. The healing was uneventful at 10 days.

In FGG technique [Figure 2], the recipient site is prepared by incising at the existing muco-gingival junction to the desired depth, blending the incision on both ends with the existing muco-gingival line [Figure 2b]. A periosteal bed is left on the recipient site to facilitate suturing. Muscle insertions are completely released. The gingival graft is harvested from the first molar-canine area of palate. The free gingival graft is finally immobilized and sutured in place [Figure 2c], with a combination of resorbable and non-resorbable sutures. Recipient site is protected with a periodontal dressing. The healing was uneventful at 10 days post-operatively. Post-operative instructions were given to the patients. The patients were advised not to brush the treated area and to avoid excessive muscle traction, chewing on, or trauma to these areas. Patients were prescribed a 0.2% chlorhexidine digluconate mouthwash twice daily. Analgesics (ibuprofen) were prescribed if indicated. At day 10-12, sutures were removed, and the areas were professionally cleaned as a supragingival prophylaxis with a rubber cup at low speed. At 3 weeks, brushing with a very soft toothbrush was reinstated. Oral hygiene instructions were reinforced, and patient was instructed to come for regular check-up. At 6 months, PE-FGG site [Figure 1d] showed better esthetics, good color match, reduced sensitivity, and greater root coverage when clinically compared with FGG site [Figure 2d].

DISCUSSION

Increase in demand for esthetics and functional treatment has led to the need of root coverage in the treatment of gingival recession defects. These root coverage procedures are aimed to achieve complete root coverage and restore esthetics. Root sensitivity, root caries, and gingival margin discrepancies can be eliminated with these procedures. It has been postulated that the presence of an inadequate width of keratinized gingiva around the teeth is often associated with difficult plaque control, persistent gingival inflammation, and gingival recession.

For decades, one of the main goals of mucogingival surgical procedures was to widen the zone of attached gingiva in areas where it is deficient to improve the periodontal health. Rubenstein et al. ^[11] described that densely organized well-collagenated zones of attached gingiva serve as a physical barrier to the inflammatory spread to the nearby bone and effectively dissipate muscular and frenal pull and remain in health with normal function. Though the technique of FGG is in the practice since its introduction in 1963 and has been extensively used. Despite its clinical superiority and more predictability, certain disadvantages associated with FGG continue to spur interest for the less invasive alternatives. Several technical modifications have been so far proposed to enhance its potential for root coverage and soft tissue improvement. ^[12,13,14,15]. The modification of free gingival graft (PE-FGG) described in this article has been designed in an attempt to overcome, at least in part, the aesthetic deficiencies associated with the conventional FGG and possibly to further increase the potential for root coverage.

The better outcomes in PE-FGG technique reported in the present case study could be explained with the peculiar design of the graft and with its technical execution as well as the choice of ideal clinical situations. The total surface of the graft was dimensioned to allow for a sufficient vascular supply. The apical de-epithelialized part of the graft was loosely placed between the alveolar mucosa and the periosteum. This might have improved the early nourishment of the graft and facilitated their survival. In PE-FGG technique, the apical portion of the graft was de-epithelialized and then graft was placed. This allows the alveolar mucosa to get reallocated spontaneously over the connective tissue part of the graft. Hence, this modification avoids the unesthetic apical displacement of the muco-gingival junction that occurs with conventional FGG technique.

Subjective evaluation was done pre- and post-operatively in both patients for tooth sensitivity which revealed that patient having PE-FGG had reduced postoperative sensitivity following surgery.

CONCLUSION

This case study concludes that the modification of free gingival graft technique could provide better results clinically when compared to conventional FGG technique. But, proper case selection and careful tissue management are the keys to the success of the application of this modification of FGG. More studies with a larger sample size would give more conclusive evidence so as to effectiveness and applicability of this technique.

REFERENCES

- [1]. American Academy of periodontology. Glossary of periodontal terms, 3rd edition. Chicago: The American Academy of Periodontology, 1992.

- [2]. Hugoson, A., Sjodin, B. & Norderyd, O. (2008) Trends over 30 years (1973–2003), in the prevalence and severity of periodontal disease. *Journal of Clinical Periodontology* 35, 405–414.
- [3]. Bjorn H. Free transplantation of gingiva propria. *Sver Tandlakarforb Tidn.* 1963; 22:684.
- [4]. Nabers JM. Free gingival grafts. *Periodontics.* 1966; 4: 243–5.
- [5]. Sullivan, H. C. & Atkins, J. H. (1968) Free autogenous gingival grafts. 3. Utilization of grafts in the treatment of gingival recession. *Periodontics* 6, 152–160.
- [6]. Cortellini P, Tonetti M, Prato GP. The partly epithelialized free gingival graft (pe-fgg) at lower incisors. A pilot study with implications for alignment of the mucogingival junction. *J Clin Periodontol.* 2012; 39: 674–80.
- [7]. Cohen ES. *Atlas of Cosmetic and Reconstructive Periodontal Surgery.* 2nd ed. Philadelphia: Williams and Wilkins; 1994. pp. 65–135.
- [8]. *Contemp clin dent* 2015 425-427.
- [9]. Allen AL. Use of the gingival unit transfer in soft tissue grafting: Report of three cases. *Int J Periodontics Restorative Dent.* 2004;24:165–75.
- [10]. Stimmelmayer M, Allen EP, Gernet W, Edelhoff D, Beuer F, Schlee M, et al. Treatment of gingival recession in the anterior mandible using the tunnel technique and a combination epithelialized-subepithelial connective tissue graft—a case series. *Int J Periodontics Restorative Dent.* 2011; 31:165–73.
- [11]. Rubenstein HS, Ruben MP, Levy C, Peiser S. Evidence for successful acceptance of irradiated free gingival allografts in dogs. *J Periodontol* 1975; 46: 195-208.
- [12]. Mormann, W., Schaer, F. & Firestone, A. R. (1981) The relationship between success of free gingival grafts and transplant thickness. Revascularization and shrinkage. A one year clinical study. *Journal of Periodontology* 52, 74–80.
- [13]. Miller, P. D. (1985) Root coverage using a free soft tissue autograft following citric acid application. III. A successful and predictable procedure in areas of deep-wide recession. *The International Journal of Periodontics and Restorative Dentistry* 5, 15–37.
- [14]. Miller, P. D. (1987) Root coverage with the free gingival graft. Factors associated with incomplete coverage. *Journal of Periodontology* 58, 674–681. 15. Tolmie, P. N., Rubins, R. P., Buck, G. S., Vagianos, V. & Lanz, J. C. (1991) The predictability of root coverage by way of free gingival autografts and citric acid application: an evaluation by multiple clinicians. *The International Journal of Periodontics and Restorative Dentistry* 11, 261–271.