

Gingival Unit Graft: A Promising Technique for the Management of Miller's Class III Recession¹Houda El Ghoulbzouri, ²Houda El Ayachi, ³OumKeltoum Ennibi, ⁴Amine Cherkaoui^{1,2,3,4} Department of Periodontology, Laboratory of Oral Biology and Biotechnology, Dental School, Mohammed V University, Rabat, Morocco**Correspondence Author:** Houda El Ghoulbzouri, Department of Periodontology, Laboratory of Oral Biology and Biotechnology, Dental School, Mohammed V University, Rabat, Morocco.**Conflicts of Interest:** Nil**Type of Publication:** Case Report**Conflicts of Interest:** Nil**Abstract**

Currently, the leading topic in muco-gingival surgery is the correction of gingival recession defects. Free gingival grafts (FGG) have been successfully used in periodontal procedures to increase attached gingiva and cover denuded root surfaces. However, there are few limitations of this technique such as esthetic mismatch, mal-alignment of muco-gingival junction formation and bulky appearance. One such modification of free gingival graft has been recently introduced by Allen and Cohen known as "Gingival Unit Graft" (GUG) where they harvested a palatal graft along with the marginal and the interdental tissue. This modification was proposed to enhance the synergistic relation between vascular configuration and involved tissues and minimize some of the unfavorable aspects of free gingival grafts. In the soft tissue graft procedures, site specific donor tissue is assumed to have improved potential for function and aesthetic survive at recipient sites.

On a clinical level, using site specific gingival unit graft that is placed on traditionally prepared recipient site results in predictable root coverage. In this case report, the clinical effectiveness of Gingival Unit Graft (GUG) technique performed on Miller class III recession is

presented. When indicated, these modifications can be advantageous over conventional free gingival grafts in management of Millers Class III gingival defects.

Keywords: Gingival recession, muco-gingival surgery, autografting, marginal gingiva, papilla.**Introduction**

Gingival recession (GR) is a term that designates the denudation of root surfaces as a result of the displacement of the gingival margin apical to the cement-enamel junction (CEJ) (1). Reports from diverse epidemiological surveys revealed that GR may affect most of the adult population (2,3). Gingival anatomical factors, chronic trauma, periodontitis and tooth alignment are considered the main conditions leading to the development of these defects that cause root hypersensitivity and aesthetic problems (4,5).

Various mucogingival surgeries are described for the insufficient dimension of soft- tissue such as free gingival grafts, connective tissue grafts, acellular dermal matrix grafts, various pedicle flaps, combinations of these pedicle flaps, graft techniques and guided tissue regeneration (6). The literature review shows different rates of success and predictability with these surgical procedures. Nevertheless, additional clinical studies are needed to

define the issues that are in a relation with the predictable and successful results (7).

Although non-submerged palatal grafts have shown predictable results for root coverage (8), some changes can be made to improve the clinical conditions of grafts including submerging the graft "butt joint" adaptation of the graft to the adjacent tissues at the recipient site, root planing with the aim of reducing its prominence and special suturing techniques to improve adaptation of the graft and its blood supply at the recipient site. The only donor site modification that can promote success in root coverage with non-submerged grafts is to increase graft thickness to maintain its viability on the avascular root surface as the synergistic relation between vascular configuration and related tissues is one of the major factors for the success in soft tissue grafts (9,10). The use of site-specific donor tissue may increase graft survival at the recipient site which does not have optimal blood perfusion.

Allen and Cohen used a palatal graft containing marginal gingiva as a free gingival graft without increasing its thickness. They used this technique based on the data in a case report (11). Gingiva has a unique structure and characteristics; the vascular plexus of the gingiva is rich of horizontal anastomoses which perfuse the marginal zone but do not extend to the interproximal area (12). Marginal and interdental gingival or supracrestal tissues are naturally created and specifically designed to function and survive on avascular denuded root surfaces, consequently, they can be used to benefit from better blood perfusion of the donor site and, therefore, improve the chances for graft survival. The vascular characteristics of the graft are probably important for rapid anastomosis of the capillaries of the recipient site with the injured vessels of the graft (13). Gingival Unit Graft (GUG) should be

harvested from an area which is not esthetically important (11).

Most clinical studies about root surface coverage have focalized on Miller I-II recessions' treatment. Defect coverage by using Gingival Unit Graft (GUG) on Miller class I-II recessions' defects revealed successful results in a previous clinical study (14). However, there is a lack of success and ability to provide root coverage in Miller III recession defects', because of interproximal bone and soft tissue loss (15). There are different anatomical characteristics when compared with Miller I-II recessions defects', as if prominent and avascular root surfaces, decreased periosteal bed and occasionally deep periodontal pockets depths' (15,16). There are only a few case studies and two clinical trials in this respect(11). The purpose of this case report is to present the satisfying clinical results of Miller class III recessions treated by using GUG.

Case Report

In September 2018, a 24-year-old woman with single Miller III recession defect on the central right mandibular incisor, was reported to the Department of Periodontology at the Dental College - Mohammad V University, Rabat, Morocco.

She had complaints about aesthetics, hypersensitivity and fear of tooth loss in lower front teeth region in the last 2 years. Medical history revealed no antecedents of systemic diseases, drug allergy or history of hospitalization. Patient was a non-smoker and did not have any cons-indications for periodontal surgery. Dental history revealed that the patient had a periodontal treatment in the age of 20 years old, however, she had an ineffective oral hygiene maintenance due to limitations in tooth brush placement resulting in plaque accumulation. We started by a complete periodontal examination which included the measurement of Probing Depth (PD), Clinical Attachment

Level (CAL), Keratinized Tissue (KT) and Vertical Recession (VR).



Fig. 1: Initial clinical view showing Miller's class III gingival recession in 41.

The salient findings noted were the presence of generalized gingival inflammation and absence of attached gingiva in 41 (Fig. 1). Intra oral periapical radiograph of region 31, 32, 41 and 42 revealed interdental bone loss extending till the apical one-third of the root surface of the 41 (Fig. 2).

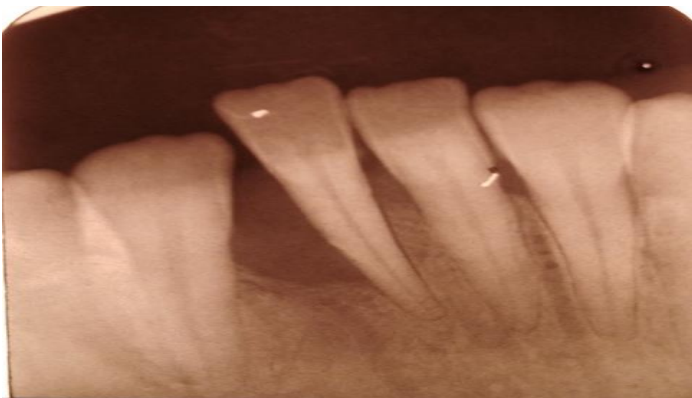


Fig. 2: Radiographic view showing the important bone loss in the 41

Based on the clinical and radiographic findings, a diagnosis of localised aggressive periodontitis was given associated to Miller's Class III gingival recession in 41.

Initial phase therapy consisting of oral hygiene motivation, mechanical periodontal treatment, prescription of antimicrobials and occlusal correction were done. Following re-evaluation phase, periodontal plastic surgical procedure consisting of Gingival Unit Graft, to minimize the recession and provide adequate zone of attached gingiva, was planned in 41.

The surgical procedure was done under lignocaine with 1:80,000 adrenaline. Supra periosteal infiltration was given in 31, 41 and 42 region. The recipient site was prepared by giving two beveled vertical incisions distal to 41, removing the surfaces of interdental papillae and extending apically mesial to the convexities of adjacent teeth, 3 to 4 mm beyond the muco-gingival line (17). The outline of the recipient site was trapezoidal as the incisions were oblique and divergent. The vertical incisions were joined at their bases by horizontal incisions that perforated the periosteum and the substance of the labial frenum. The soft tissue within these limits were removed by sharp dissection, completing a frenectomy and the base of the recipient site was about ≥ 5 mm apical to the most apical part of the recession. The exposed portion of the root surface was prepared with a curette and then rinsed with sterile saline thoroughly (17,18)

Following a greater palatine nerve block, the donor gingival unit graft was harvested from the palatal aspect of maxillary first premolar using a 15C blade. The graft was harvested by including the gingival margin along with the interdental papilla with a thickness of about 1 to 1.5 mm (Fig. 3).



Fig. 3: The gingival unit graft harvested from the palatal region of 25.

Then the grafts were contoured, adapted and sutured and a periosteal suture was placed at the apical portion of the graft to assure intimate contact between the graft and the recipient bed. The graft was compressed and held in position for two minutes to reduce the dead space (Fig. 4).



Fig. 4: Suturing of the Gingival Unit Graft

For post-surgical care, patient was prescribed analgesics for a period of five days. Patient was also advised to rinse twice daily with 0.2% chlorhexidine solution for three weeks and to avoid brushing and hard chewing. Sutures removal was done after 15 days.

During the first 2 months, recall appointments were scheduled every second week. Later, patient was called once a month for the postoperative follow-up period.

Clinical healing in both the recipient and donor sites was complete and uneventful, no complications were observed and keratinized tissue gain in 41 was apparent. (Fig. 5,6).



Fig. 5: Healing at 2 weeks in recipient and donor sites



Fig. 6: Healing at six weeks follow-up

At 3 months follow-up partially root coverage was achieved. Furthermore, an acceptable colour match and configuration harmony with adjacent gingival tissues were seen (Fig. 6). Patient decided to undergo orthodontic treatment for esthetic reasons.



Fig. 7: Healing at tree months follow-up

Discussion

The term Free Gingival Grafts (FGGs) was first suggested by Nabers et al. although the technique was initially described by Bjorn et al. (17, 19). Since then, it has been a common technique to cover denuded root surfaces to increase the width and thickness of attached gingiva. The advantages of using an FGG are high predictability and relative ease of the technique. However, the conventional FGG has certain inherent limitations such as aesthetic mismatch and bulky appearance (11). Various modifications have been developed in the donor and recipient sites in order to overcome the limitations of FGG. Gingival unit graft is a variant of FGG in which the palatal graft is harvested along with the marginal gingiva and interdental papilla (13). This technique was first described by Allen and Cohen (11). One of the key factors of success of root coverage procedures is the vascularity. The synergistic relation between vascular configuration and related tissues plays a vital role in the success of soft tissue grafts (13). The authors argue that the blood supply in the marginal and papillary parts of the gingiva is higher than that of the apical gingiva as it contains several interconnecting loops, hairpin networks, anastomoses and form a dense vascular plexus. This vascular part of gingiva, when included in the graft, gives superior tissue

integration with recipient bed along with a more esthetic coverage and favorable tissue blend (20).

The efficiency of GUG was studied by Kuru and Yildirim (13). They compared the gingival unit graft and the conventional free gingival graft in patients with Miller class I/II gingival recessions. This Randomized Controlled Clinical Trial (RCT) was done by comparing conventional FGG and GUG in Miller's class I and II defects. The authors observed that reduction in vertical recession, attachment gain and keratinized tissue gain were significantly higher in gingival unit group, which led to the conclusion that GUG had better aesthetic outcome when compared to FGG and 50% of the sites in gingival unit group showed complete defect coverage at the end of eight months (13). A recent Randomized Controlled Clinical Trial (RCT) by Jenabian et al. was a split mouth study design done comparing FGG with GUG in Miller's class I and II recessions. The GUG side produced significantly greater aesthetic satisfaction, higher healing index, low post-surgical pain score and greater reduction in recession width when compared to FGG (9). Furthermore, Gajendran et al. (21) has recently presented a case report of 100% defect coverage in 31 and 41 Miller's class III recession with GUG. Moreover, after a three months period, an acceptable color and configuration harmony was noted in 31 and 41 regions. In the present case report, there were some slight differences in the color seen when compared with the adjacent tissues at 3-month interval. Moreover, healing was uneventful in palatal donor site with no attachment loss or recession evident.

Over the years, the FGG has lost its popularity comparing to sub-epithelial connective tissue grafts or coronally advanced flaps in the treatment of gingival recessions. However, it is still the gold standard surgical technique for increasing the Keratinized tissue (KT) zone. A modification like GUG with the inclusion of marginal and

papillary gingival tissue has better esthetic results and maximizes the success of root coverage by rapid re-establishment of vascularity in such non-submerged grafts (6,8,13,22).

Conclusion

The Gingival Unit Graft (GUG) technique performed in this case can be successfully used for the management of Miller's class III recession defect. Although this technique is easy, predictable and less invasive it needs proper case selection and careful tissue management as they are the key to the success of the application of these modifications of FGG. This said, more clinical studies and needed to give more conclusive evidence regarding the effectiveness and applicability of this promising technique in treatment of Miller's class III gingival recession.

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