

Management of inadequate width of attached gingiva using mucograft

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ABSTRACT

Attached gingiva around the teeth is crucial in preserving periodontal health. Plaque development and soft-tissue recession are both prevented by adequate attached gingiva. The processes for harvesting soft-tissue grafts are frequently accompanied by some level of morbidity which results in commercially available xenogeneic collagen matrices. The blood clot is more effectively stabilized by this collagen matrix, which also promotes vascularization. Furthermore, this biomaterial enhances root coverage and keratinized gingiva regeneration in both width and thickness. The purpose of the case report is to increase the width of attached gingiva using Mucograft®. This case report highlights a case scenario where a patient presented with probing depth of 6–8 mm in relation to 24, 25, 26, 27, and 28, Grade I mobility in relation to 25, 26, and 1 mm of the width of attached gingiva in relation to 25, 26, and 27. Flap surgery was done and simultaneously vestibular deepening was done in relation to 25, 26, and 27, and mucograft was placed and stabilized. On a 3-month follow-up, probing pocket depth was 3 mm and 4 mm of width of the attached gingiva was seen in 25, 26, and 27. The Mucograft® was beneficial in this clinical case for the purpose of extending the width of the associated gingiva, making it a feasible treatment option for soft-tissue augmentation.

Key words: Attached gingiva, keratinized gingiva, mucograft, regeneration, shallow vestibule

INTRODUCTION

Attached gingiva is the part of gingiva that runs from the base of the gingival fissure to the mucogingival junction. On the margins, it is continuous with the gingiva. The alveolar periosteum is robust, resilient, and closely connected to the underlying periosteum. Subtract the depth of the sulcus or

pocket from the distance between the crest of the gingival edge and the mucogingival junction to get the width of attached gingiva.^[1] The presence of an acceptable width of attached gingiva was thought to be important for maintaining marginal tissue health and preventing continual connective tissue attachment loss. Inadequate gingival zone facilitates subgingival plaque formation due to poor pocket closure caused by the mobility of marginal tissue and favors attachment loss and soft-tissue recession due to tissue resistance to plaque-associated gingival lesion apical spread.^[2]

The foundation for optimal gingival function is the structure of the gingival tissues. The presence of a thick keratinized gingival coating acts as a protective barrier against mastication pressures, as well as heat and chemical

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stressors. The gingival connective tissue's integrity also appears to counterbalance the stresses exerted on the gingiva by the mastication and facial expression muscles, as well as frenal pull.^[3-5] Increase the width of attached gingiva in patients who have discomfort when cleaning and eating their teeth, have severe periodontal pockets, or are in orthodontics when the end position is predicted to result in recession.^[6,7] Various treatments such as free gingival graft (FGG), connective tissue graft (CTG), and other techniques such as lateral pedicle flap can be used to widen the keratinized connected gingiva (apical or coronal to the area of recession).^[8,9]

Even though a high success rate is seen with FGG and CTG,^[10] the problem with those methods is the second surgical site, the limited quantity of tissue, delayed wound healing, patient compliance, and morbidity.^[7,11] To overcome this problem, commercially available materials were introduced into the market, such as AlloDerm[®], Mucograft[®], and FibroGuide[®].^[12-15]

The Geistlich Mucograft[®] three-dimensional collagen matrix is an excellent soft-tissue regeneration biomaterial. The graft membrane's collagen stimulates the host's fibroblasts to produce new collagen fibers. The mucograft's porosity allows for a greater penetration of mesenchymal cells into the transplanted area. Unlike the traditional response to foreign entities (the creation of massive multinuclear cells, lymphocytes, and granulation tissue), the host does not reject the mucograft tissue and accepts it without repercussion. Our research and knowledge have resulted in high-quality publications from our team.^[16-29] Literature evidence reveals utilizing mucograft shows positive results in terms of gain in keratinized tissue.^[12-14,30,31] This case report highlights the efficacy of Mucograft[®] to improve the width of attached gingiva.

MATERIALS AND METHODS

Clinical and radiographic presentation

A 47-year-old male patient reported the chief complaint of bleeding gums and food lodgment in relation to the upper left back tooth region from the past 6 months. On clinical examination, bleeding on probing in relation to 24, 25, 26, 27, and 28, probing depth of 6–8 mm in relation to 24, 25, 26, 27, and 28, Grade I mobility in relation to 25 and 26, and 1 mm of the width of attached gingiva in relation to 25, 26, and 27 was observed [Figure 1]. On radiographic examination, widening of the periodontal ligament and bone loss extending till the junction of the middle third and apical third of the root surface in relation to 25 was observed.

Case management

Full mouth scaling and root planing was done. After 2 weeks, the patient was recalled for flap surgery in relation to 24, 25, 26, 27, and 28. Informed consent was obtained from the patient. Under local anesthesia, a full thickness mucoperiosteal flap

was elevated. Debridement was done using Gracey curettes. Intrabony defect was seen in relation to 25 after complete debridement [Figure 2]. Root biomodification was done by applying ethylenediaminetetraacetic acid on root surfaces to remove the smear layer, and saline irrigation was done. OSSEOGRAFT which is bovine-derived type 1 collagen mixed with injectable platelet-rich fibrin, was placed in the defect and was covered by PERIOCOL GTR membrane. After suturing the flap [Figure 3], vestibular deepening was done in relation to the buccal vestibule of 25, 26, and 27 [Figure 4]. Mucograft[®] was placed on the connective tissue bed and was stabilized by periosteal sutures [Figure 5]. Antibiotics and analgesics were prescribed for 5 days, and the patient was recalled after a week for suture removal.

RESULTS

On reevaluation after a week, healing was satisfactory and suture removal was done. On a 3-month follow-up, gingiva appeared healthy, probing pocket depth was 3 mm, no mobility, bone fill was evident in the radiograph in 25, and 4 mm of the width of attached gingiva was seen in 25, 26, and 27 [Figure 6].

DISCUSSION

The present case report highlights the management of inadequate width of attached gingiva with the use of Mucograft[®].

Rokn *et al.* conducted a randomized control trial to compare Mucograft[®] and FGG in augmenting the keratinized tissue around the teeth. It was found that the Mucograft[®] was superior when compared to FGG in terms of gain in keratinized tissue, less pain, less surgical chair time, and better esthetics.^[13] Similarly, in another study, Mucograft[®] and FGG were used to increase the keratinized tissue around the tooth, where Mucograft[®] showed superior results when compared to FGG.^[32] The present case shows similar results, as Mucograft[®] results in improving the width of keratinized tissue.

When CTG and Mucograft[®] were compared to increase the width of attached gingiva, it showed that there is no statistically significant difference in terms of root coverage and gain in keratinized tissue. However, less patients' morbidity^[33] and less surgical time were seen with Mucograft[®]. CTG and Mucograft[®] when used with modified coronally advanced flap is (modified CAF) in a 12-month follow-up,^[34] showed that mean root coverage was superior for CTG. Whereas gain in width of attached gingiva was seen in both groups. In terms of patients' morbidity and surgical time, Mucograft[®] is superior to the CTG.^[35]

Vallecillo *et al.* conducted a systematic review on collagen matrix versus CTG to gain soft-tissue attachment and



Figure 1: Preoperative picture showing inadequate width of attached gingiva



Figure 2: Intraoperative picture showing two wall defects in relation to 25



Figure 3: Immediate postoperative picture of flap surgery



Figure 4: Picture showing deepening of the vestibule in relation to 25, 26, and 27



Figure 5: Mucograft® placement and secured with sutures



Figure 6: Three months postoperative picture showing increase in width of attached gingiva in relation to 25, 26, and 27

concluded that even though autogenous CTG achieves higher values, the collagen matrix is an effective alternative in terms of increasing the total width of keratinized tissue.^[36] This is in accordance with the present case, where there is an adequate gain in width of the attached gingiva.

CONCLUSION

Mucograft® appears to be an effective option, in this case, to report the autogenous soft-tissue grafts with regard to the gain in keratinized tissue, with less postoperative morbidity and surgical time. Further large clinical trials are needed to substantiate the benefits of Mucograft® in the augmentation of the width of attached gingiva.^[34,37]

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Conflicts of interest

There are no conflicts of interest.

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