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Case Report

Management of single tooth gingival recession using free gingival grafting followed by coronally advanced flap with cross-linked collagen matrix: A case report

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ABSTRACT

Gingival recession is the exposure of root surfaces due to apical migration of the gingival margins beyond the cementoenamel junction and is considered as one of the most common esthetic concerns associated with periodontal tissues. Insufficient gingival thickness and lack of adequate width of attached gingiva are considered to be the most common reason for progressive gingival recession. This case report presented the management of gingival recession in the lower anterior tooth using two-stage recession coverage technique. In the first stage, free gingival grafting was performed which was followed by coronally advanced flap in combination with cross-linked collagen matrix (Fibro-Gide, Geistlich Biomaterials, Switzerland) for recession coverage and enhancement of gingival thickness. Three-month follow-up of the case reported significant enhancement in clinical parameters with improvement in patient's esthetic demand.

Keywords: Coronally advance flap, Collagen matrix, Free gingival graft, Gingival recession

INTRODUCTION

Gingival recession is the apical migration of gingival margin to the cementoenamel junction (CEJ). The distance between the CEJ and gingival margin gives the level of recession.[1] The root coverage (RC) procedures are indicated for esthetic purposes, for reducing hypersensitivity, for treating gingival margin inconsistency, and for enhancing keratinized tissue. Numerous surgical RC modalities, for example, free gingival autograft, subepithelial connective tissue graft, lateral repositioned flap, double papilla flap, semilunar flap, coronally advanced flap (CAF), guided tissue regeneration, tunnel technique, and pinhole technique, have been proposed. Management choice for suitable RC procedure depends on the size and number of the recession defects, quantity and quality of keratinized tissues, gingival thickness, the width and height of the interdental papillae, the presence of frenum pull, and the depth of the vestibule, as well as the patient esthetic and functional demands.[2]

In the past few years, soft-tissue graft substitute, consisting of collagen matrix (Fibro-Gide, Geistlich Biomaterials, Switzerland), have been popularized as an alternative to autogenous soft-tissue grafting. (Geistlich Biomaterials, Switzerland) has been proposed as an alternative to connective tissue grafting owing to its property of cross-linking Type I and Type II collagen.[3-5] The present case report suggested the two-stage management of localized gingival recession using free gingival grafting procedure in Stage 1 followed by CAF in combination of (Geistlich Biomaterials, Switzerland) in Stage II.

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CASE REPORT

A 20-year-old non-smoker and non-alcoholic (self-reported) female patient with non-contributory medical history reported to the department of periodontology with chief complaint of receding gums in the lower anterior region. The patient has habit of tongue thrusting. Intraoral examination revealed fair oral hygiene with mild plaque and calculus with proclined maxillary anterior. Careful correlative analysis of clinical findings, radiographs, and cast model revealed positive Fremitus test, Angle's Class I malocclusion with division II, Miller Class III gingival recession (3 mm), and Grade 2 mobility with respect to 31 [Figure 1a and 1b]. Periodontal examination including roll test showed lack of attached and keratinized gingiva apical to gingival recession in 31 [Figure 1c]. Since there was lack of attached/keratinized gingiva, therefore, two-stage periodontal plastic surgical procedures were advised first to increase attached gingival followed by coronally advanced flap for RC. Written informed consent from the patient was obtained after explaining the entire procedure. Orthodontic consultation was professed and habit breaking appliance for tongue thrusting was given by the orthodontist [Figure 1d]. Trauma from occlusion was corrected by selective grinding. Scaling root planing followed by splinting was performed during Phase I therapy, the patient was advised for blood investigation and prepared for surgery to correct gingival biotype. The patient was reappointed for further surgical procedure.

In Stage I surgery, free gingival graft (FGG) procedure was performed for increasing thickness of gingiva with respect to 31 [Figure 1e-j]. Platelet-rich fibrin was adapted on palatal donor site for enhanced healing. Sufficient amount of attached/keratinized gingiva was obtained at follow-up visits [Figure 1k]. Three months after the Stage I surgical procedure, coronally positioned flap (CPF) was performed in relation to 31 [Figure 2a]. Cross-linked collagen matrix (Fibro-Gide, Geistlich Biomaterials, Switzerland) was used as an adjunct to CPF as per manufacturer guidelines.

CAF performed was according to De Sanctis and Zucchelli;[6] however, due to insufficient dimension of interdental papilla,

Figure 1: (a) Intraoral photograph showing measurement of gingival recession, (b) radiograph showing bone loss in relation to 31, (c) intraoral figure showing inadequate zone of attached gingiva using roll test, (d) orthodontic appliance applied for breaking tongue thrusting habit, (e) intraoral photograph showing recipient bed, (f) intraoral photograph showing marking on the palate for free gingival graft procurement, (g) photograph showing measurement of free gingival graft obtained, (h) intraoral photograph showing placement of free gingival graft on recipient bed, (i) intraoral photograph showing complete stabilization of free gingival graft, (j) intraoral photograph showing placement of Coe-Pak, and (k) 14 days post-operative photograph of surgical site after suture removal.

Figure 2: (a) Three-month follow-up of surgical site and marking of CEJ, (b) intraoral photograph showing oblique incision adjacent to gingival recession, (c) intraoral photograph showing reflection of flap, (d) intraoral photograph showing elevated flap being released by 15c blade, (e) intraoral photograph showing tension-free coronal advancement of flap, (f) photograph showing Fibro-Gide (Geistlich Biomaterials, Switzerland) trimmed for placement, (g) intraoral photograph showing placement of Fibro-Gide (Geistlich Biomaterials, Switzerland) on recipient bed, (h) intraoral photograph showing coronally sutured flap using 5-0 proline suture under loupe, (i) intraoral photograph showing placement of Coe-Pak, (j) 2-week post-operative photograph of the surgical site, and (k) 6-week follow-up photograph of the surgical site.

two oblique incisions instead of two horizontal releasing incisions were made using 15c blade on mesial and distal to the recession defect. These oblique incisions were extended beyond mucogingival junction into alveolar mucosa [Figure 2b]. Full-thickness flap was elevated till mucogingival junction and then partial-thickness flap was raised beyond mucogingival junction so that flap can be easily elevated [Figure 2c-e]. Bilateral interdental papillae were epithelized both mesial and distal to recession. Cross-linked collagen matrix (Fibro-Gide, Geistlich Biomaterials, Switzerland) was cut according to the recipient site and secured on the exposed root surface while covering almost twice the area of avascular root beyond recession site so that collagen matrix snuggly fitted into the recipient site [Figure 2f and g]. Collagen matrix was then covered with coronal mobilization of the flap, and coronally repositioned flap was sutured using microsurgical approach with 5-0 proline sutures under loupe [Figure 2h]. Surgical site was covered with Coe-Pak and written post-operative instructions (not to brush on surgical site, but to rinse with 0.2% chlorhexidine twice daily for 1 min) were given [Figure 2i]. Antibiotic (amoxycillin 500 mg thrice daily) for 5 days and analgesic (ibuprofen 400 mg as required) for 3 days were prescribed and recalled after 2 weeks. On subsequent visit after 14 days, sutures and Coe-Pak were carefully removed and oral hygiene instructions were reinforced [Figure 2j]. Clinical examination revealed uneventful healing. After suture removal, Coe-Pak was again applied to avoid undue mechanical trauma during brushing, etc., on the surgical site for 2 weeks. Clinical follow-up 6 weeks after the surgical procedure revealed gain in gingival thickness and partial RC of 2 mm [Figure 2k]. The patient is currently under continuous follow-up after every 3 months.

DISCUSSION

Gingival recession is a common condition among the general population, with a prevalence of 78%, being mostly located on the buccal surfaces of the teeth; the prevalence of recessions increases with age 17 and is related to several factors such as presence of gingival inflammation, tooth positioning and morphology, brushing trauma, and orthodontic movement.[7] It is an established fact that the absence of the marginal keratinized tissue or inadequate

presence of attached gingiva increases the susceptibility for marginal tissue recession.[8,9]

The present case reported two-stage management of localized gingival recession in the lower anterior tooth. FGG is the ideal technique for obtaining sufficient amount of keratinized gingiva.[10] Recently introduced cross-linked collagen matrix "Fibro-Gide" by Geistlich Biomaterials (Switzerland) is a biomaterial which has demonstrated favorable mechanical properties and biological attributes for enhancing ingrowth of human fibroblasts.[3,11] Further, it has been shown to have favorable tissue integration and promotion of angiogenesis.[3] Similar to the previous studies, the present case report also advocates that Fibro-gide (Geistlich Biomaterials, Switzerland) produced a volume increase in mucosal thickness in insufficient thin gingival biotype. The most important aspect of the present case report was significant gain in thickness of soft-tissue apical to recession that can further result in long-term stabilization of the covered recession tissue and creeping attachment later on.[12,13] However, 100% RC could not be obtained in the present case due to interdental bone loss and surgical limitation of the operator to reposition the gingival margin coronal to CEJ.

In the present case report, two-stage procedure was chosen as there was lack of sufficient amount of keratinized/attached gingiva to perform CAF. Further, anecdotally, it has been presented by the manufacturer of Fibro-Gide (Geistlich Biomaterials, Switzerland) that sufficient amount keratinized tissue is of paramount importance for complete coverage of the collagen matrix. Therefore, every effort is made to cover the entire membrane by coronal positioning of flap.

CONCLUSION

Based on the results of the present case report, it can be concluded that cross-linked collagen matrix, Fibro-Gide (Geistlich Biomaterials, Switzerland) can be considered as an alternative source of autogenous soft-tissue grafting, especially when volume of soft tissue needs to be enhanced. However, results presented are based on single case report; therefore, long-term multicentric randomized controlled or comparative clinical trials with the gold standard connective tissue grafting are recommended to validate the results.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

Dr. Vivek Kumar Bains is the editor of AJOHAS.

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