



SOFT TISSUE AUGMENTATION AROUND MAXILLARY FIRST MOLARS USING 2 DIFFERENT SURGICAL TECHNIQUES – A SPLIT MOUTH CASE

Periodontics

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ABSTRACT

Gingival recession, resulting in exposed root surface of the tooth in molar regions are usually difficult to treat, because of anatomical and surgical limitations such as reduced keratinized tissue width and limited accessibility, respectively. An untreated recession progresses to further diminish remaining available keratinized tissue, leading to loss of attachment, progression of periodontitis and eventually compromises the long-term stability of the teeth. The present case report aims to establish the effectiveness of free soft tissue grafts for the augmentation of keratinized tissue around molar teeth.

KEYWORDS

Free gingival graft, sub-epithelial connective tissue graft, keratinized tissue width, soft tissue augmentation.

INTRODUCTION-

Gingival recession is the apical shift of the gingival margin with respect to the cemento-enamel junction (CEJ), resulting in exposure of the root surface to the oral environment. Predisposing factors for gingival recession (GR) include thin periodontal biotype, aberrant frenum, lack of attached gingiva and reduced thickness of the alveolar bone due to abnormal tooth position in the arch. Poor oral hygiene maintenance, vigorous tooth brushing and restorations with intrasulcular margins are few other factors which attribute to GR⁷.

A systematic review and meta-analysis reported that prevalence of GR is 78% globally with buccal recession contributing to an average of 75%¹⁵. In an epidemiological study by Mythri et al¹¹ the prevalence of gingival recession was 13.2% for maxillary molars, accumulation of biofilm lead to 44.1% of GR followed by faulty tooth brushing with 42.7%. Exposure of buccal corridor space may reveal gingival recession on the buccal surfaces of maxillary molars, resulting in compromised aesthetics. Molar recession extending to furcation results in early furcation involvement, especially when there is inadequacy in oral hygiene. Hence mucogingival procedures become a necessity to enhance both the prognosis and aesthetics of the affected tooth⁴.

Adequate Keratinized Tissue (KT) width and thickness is of key importance, as it acts as a barrier to mechanical forces and creates a zone favourable for maintaining self-performed oral hygiene. 2 mm of keratinized gingiva with 1 mm of attached gingiva has been recognized as crucial to maintain gingival health⁸.

Various surgical modalities have been advocated for KT augmentation. Augmenting soft tissue facilitates better biofilm control and increases the zone of keratinized tissue thus prevents further recession. Soft tissue augmentations (STA) are procedures performed around teeth and dental implants to recreate lost or reduced mucogingival tissues³ using both autogenous and non-autogenous grafts. Autogenous grafts include Free Gingival Graft (FGG), Subepithelial Connective Tissue Graft (SCTG) and its modification. Non- autogenous grafts include Soft Tissue Substitutes (STS) and tissue engineered materials such as 3-dimensional scaffold. FGG a routinely performed STA procedure has been reported with gain in KT of 4.2mm and 0.6 mm creeping of gingival margins.¹ The Mean Root Coverage (MRC) achieved with Coronally Advanced Flap (CAF) and SCTG ranges between 70–80%, complete root coverage (CRC) is 20-40% and attachment gain was 1.5-2 mm for Cairo's Recession Type III defect⁵.

This case report done in split study manner attempts to depict differences in keratinized tissue augmentation using FGG and SCTG in maxillary molar region.

Case Description-

A 34-year-old male patient presented to Department of Periodontology, Ragas Dental College and Hospital with chief complaint of bleeding gums. On examination, Full Mouth Plaque Score (FMPS) of 47%, Full Mouth Bleeding Scores (FMBS) of 35%

with Cairo's recession type III (RT3) in 16 and 26 was noted. Patient was diagnosed with soft tissue recession (Mucogingival deformities and conditions around teeth)⁷, with no premature occlusal contacts, mobility or furcation involvement, minimal KT with thin gingival biotype in 16 and absence of KT in 26. Periapical radiographs revealed horizontal bone loss extending up to middle third in 16 and 26.

Though the patient was asymptomatic, he was explained regarding the possible sequelae of recession, if left untreated. Patient depicted concern regarding management of recession and opted for surgical correction of the defect.

Clinical parameters recorded at baseline, 4th and 8th week post-operatively include, FMBS, FMPS, Probing Pocket Depth (PPD), Clinical Attachment Level (CAL), Recession Depth (RD), Recession Width (RW), Remaining Keratinized Tissue Width (RKTW) and Keratinized Tissue thickness (KTT) which was measured using an endodontic file with stopper. Complete ultrasonic scaling was done and modified stillman's technique of brushing was advised. STA was planned in 16 and 26 region, two weeks post phase I therapy. Changes in KT dimensions was considered as the primary outcome and reduction in RD as the secondary outcome.

Site 16- Connective Tissue Graft With Epithelial Cuff

16 presented with a RKTW of 2mm, so decision was made to coronally advance the flap and augment the site using CTG with epithelial cuff. Surgical procedure was performed under local anaesthetic. Recipient site was prepared by raising a split thickness flap combined with vertical releasing incision extending beyond mucogingival junction. The recipient site was thoroughly debrided and papilla was de-epithelialized. At the donor site, greater palatine nerve block was given and SCTG was harvested from palate as mentioned by Langer and Langer 1985⁹. Graft was secured in recipient bed using periosteal suture (4/0 polyglactin 910 sutures). Flap was coronally advanced with minimal tension and vertical incisions was secured using simple interrupted suture (4/0 black braided silk). Palatal stent was placed to protect the donor site. Periodontal dressing was placed in the recipient site.

Site 26- Free Gingival Graft

RKTW was nil in 26, hence augmentation was planned using FGG. Under local anaesthesia, vertical releasing incision were given, the recipient site was de-epithelialized and thoroughly debrided. At the donor site, greater palatine nerve block was given and FGG was harvested from palate as described by Bjorn 1963¹⁴. Graft was secured in recipient bed with periosteal suture (5/0 polyamide). Palatal stent was placed to protect the donor site. Periodontal dressing was placed in recipient site.

Post-operative instructions- Analgesics, antibiotics and use of chlorhexidine (0.12%) mouthwash twice daily for 2 weeks was advised. The sutures were removed 2 weeks post-surgery. No dehiscence, infection or necrosis was observed. Post- surgery, patient was advised to follow charter's brushing technique.

Table 1 – Clinical Data- Buccal Surface

	ASSESSMENT PERIOD	PPD			CAL			RD			RW	RKTW	KTT
		MB	MB	DB	MB	MB	DB	MB	MB	DB			
16	Pre-operative	1	1	1	4	4	4	3	3	3	7	2	1
	Post-operative	2	1	2	3	2	3	1	1	1	7	4	3
26	Pre-operative	1	1	2	5	5	5	4	4	3	6	-	1
	Post-operative	1	1	2	3	3	4	2	2	2	6	4	2

(PD- Probing Pocket Depth, CAL- Clinical Attachment Level, RD- Recession Depth, RW- Recession Width, RKTW- Remaining Keratinized Tissue Width, KTT- Keratinized Tissue Thickness; measurements are described in mm)

RESULTS-

Both recipient and donor sites healed uneventfully when observed at 4th and 8th week intervals. There was significant gain in both KT width and thickness evident at 4th week and 8th week in 16 and 26 regions. Colour match was excellent in 16 region.

Table-2 – Changes Observed In Primary And Secondary Outcome

ASSESSMENT PERIOD	16			26		
	RKTW	KTT	RD	RKTW	KTT	RD
Baseline	2	1	3	-	1	4
4 th week	4	4	1	4	2	2
8 th week	4	4	1	4	2	2

(Changes are described in mm)

Photographs IRT 16

**Figure I-** Pre- operative**Figure II-** Split-thickness flap**Figure III-** Harvested CTG with epithelial cuff**Figure IV-** Immediate post-operative**Figure V-** post-operative- 10th day**Figure VI-** post-operative- 4th week**Figure VII-** post-operative- 8th week

Photographs IRT 26

**Figure I-** Pre- operative**Figure II-** De-epithelialization of recipient site**Figure III-** Harvested FGG**Figure IV-** Immediate post-operative**Figure V-** post-operative- 10 days**Figure VI-** post-operative- 4th week**Figure VII-** post-operative- 8th week

DISCUSSION-

The present case report evaluated the effectiveness of FGG and CAF with SCTG in keratinized tissue augmentation, around maxillary first molars.

Both the techniques were observed to be clinically effective in increasing KT width with a greater gain in KTT observed in 16 region treated with SCTG, which can be attributed to bilaminar technique¹⁶, where the remaining KT is included in the flap overlying CTG. In 26 region, since FGG was positioned apically to the recession defect, a comparatively lesser yet significant gain in KT was observed postoperatively.

The gain in CAL, along with the increase in KTT and KTW, signify important enhancements in periodontal health. These improvements positively influence the prognosis of the involved tooth and provide justification for treating gingival recession in molar teeth, even when this patient was asymptomatic.¹⁷ A systematic review by Chambrone et al.⁶ stated that, 78.1% sites examined demonstrated increase in attachment loss, if left untreated results in deepening of recession. There were no changes with respect to recession width in both the treated sites. Since it was Cairo's RT III defect, only partial RC could be achieved⁵.

Surgical management of molar recession could be challenging to perform, which could be further explained by the anatomical factors and surgical limitations. Anatomical factors include root concavities and limited keratinized tissue. Surgical limitations include limited visibility, difficulty in tissue retraction caused by pressure from buccal pad of fat and buccal mucosa; other factors like precise flap reflection and suturing of graft to the recipient site makes it a technically sensitive task.¹⁷

Superior colour match and aesthetics was observed in SCTG-treated site, when compared to paler FGG-treated. The absence of flap dehiscence must be considered a positive outcome for SCTG treated sites, as the colour and texture of the exposed graft rarely match from an aesthetic stand point with those of the adjacent soft tissue^{13,16}. Thicker grafts, physiological gingival pigmentation, or individual phenotype may contribute to noticeable colour mismatches.³ Colour match, was however not considered as a primary outcome in our study.

The stability of the augmented tissue thickness and creeping attachment was not observed as a parameter in our study, because of the shorter duration of follow-up period. Orsini et al¹² reported that the shrinkage of CTG could be seen from 1st month to 52 weeks. Creeping attachment could be observed upto a period of 27 years post-augmentation using FGG, as mentioned in a longitudinal study by Agudio et al².

Appreciable data regarding STA of molar sites are limited. Well-designed studies for the treatment of mucogingival defect around molars with longer observational period are the need of the hour.

CONCLUSION-

Soft tissue augmentation around molars is a challenging procedure due to anatomical factors and technical complexity. Autogenous grafts, such as CTG and FGG remain the gold standard for achieving gain in KTW and KTT, with CTG providing superior aesthetic outcomes and FGG ensuring predictable increases in keratinized tissue.

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