

CASE STUDY

Inverted T-shape free gingival graft for treatment of RT3 gingival recession defects: Reporting of two cases

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Abstract

Introduction: One of the most challenging aspects of treating gingival recession type 3 (RT3) is reconstructing lost interdental papillae, which is directly related to the loss of interproximal bone. Free gingival graft (FGG) has been successfully used to increase the keratinized tissue width (KTW) with minimal trauma to the interdental papilla. This presented case suggests that FGG can be used for reconstruction of lost interdental papilla creeping attachment also plays an additional role in improving the results.

Case Presentation: The included two case reports suggest a novel technique using an FGG that is shaped in an inverted T-shape to achieve partial root coverage, improve the compromised interdental papilla, and increase the KTW in RT3 defects.

Conclusions: This report presents a novel yet intuitive surgical technique for partial coverage of RT3 defects and reconstruction of the interdental papilla.

Summary: The inverted T-shape soft tissue graft may be a valuable technique for papillary reconstruction in the challenge of RT3 recessions.

KEYWORDS

gingival recession, gingival diseases, periodontal disease, humans

Key points

Why is this case new information?

- Reporting innovative technique with the interproximal extension of the FGG that sutured lingually with the lingual marginal gingiva.
- Improve interdental clinical attachment phenotype and height.
- More predictable root coverage because of increased vascularized interproximal bed for the graft to be survived.

What are the keys to the successful management of this case?

- Having at least 2mm interproximal space for graft survival.
- Good Extension with proper fixation of the lingual part of the graft, and stabilization of the graft.

What are the primary limitations to success in this case?

- limited capacity for perfusion and survival of the lingual extension due to limited vascularity.
- More investigations are necessary to confirm the validity of this technique.

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BACKGROUND

Unlike recession type (RT)1 and to an extent RT2, treatment of RT3 gingival recession is unpredictable due to severe interdental soft and hard tissue loss, and generally has very poor therapeutic prognosis.^{1,2} Researchers and clinicians have been working to discover novel, more efficient surgical techniques to gain more predictable results.^{3,4} The first use of free gingival graft (FGG) for treatment of Miller class IV were by Miller and Binkley in 1986 to achieve ridge augmentation and root coverage.⁵ Many changes have been made since then to improve the predictability outcomes. A connective tissue graft containing marginal gingiva as a free gingival unit graft (GUG) was utilized over de-epithelized papilla with an adequate papilla base. This provides a greater blood supply for the graft and subsequently contributes to improved proximal tissue quality and predictability of root coverage of Miller Class III(RT2) and Class IV(RT3) sites.^{4,6} Other authors reported recession reduction and keratinized tissue width (KTW) gain among GUG group compared with conventional FGG group.⁷ This report describes a novel technique through which an FGG with a lingual extension in a shape of an inverted T is utilized to improve the clinical attachment, gain partial root coverage, and improve KTW, by deepening the vestibule.

Thus, the aim of this report was to demonstrate two cases done using the innovative “inverted-T” technique for the treatment of RT3 gingival recession defects (Figures 1 and 2).

MATERIALS AND METHODS

Case 1

Clinical presentation

A 43-year-old female presented at Al-Hussain private dental clinic, Tripoli, Libya in 2020 with the chief complaint of a long-standing recession on teeth number 24 and 25. Medical history revealed no significant findings. Relevant dental history showed compromised oral hygiene and difficulty with toothbrushes in this area. The completed periodontal examination included probing depth, clinical attachment level, KTW, and recession depth (distance between CEJ and the most apical point of the gingival margin). Clinical examination revealed generalized gingival inflammation with marginal tissue recession in teeth number 24 and 25 associated with the aberrant frenulum, loss of papilla, and a decreased KTW. Spacing and mild proclination were noted too. Intra-oral periapical radiographs of regions 23–26 found horizontal bone loss extending to the apical one-third of the root. Based on the clinical and radiographic findings, the patient was found to be localized Stage III Grade B Periodontitis with localized gingival inflammation

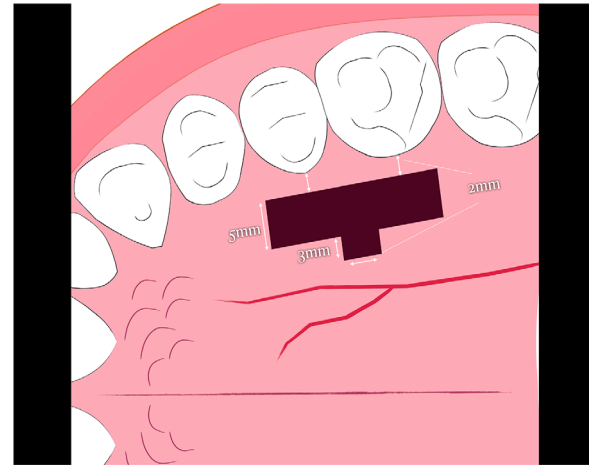


FIGURE 1 The design of the inverted T-shape with respect to the marginal gingiva 2 mm away, also taking into consideration the position of the greater palatine blood vessels at 5 mm. 2 mm is required for the width of the interproximal extension with 3 mm length.

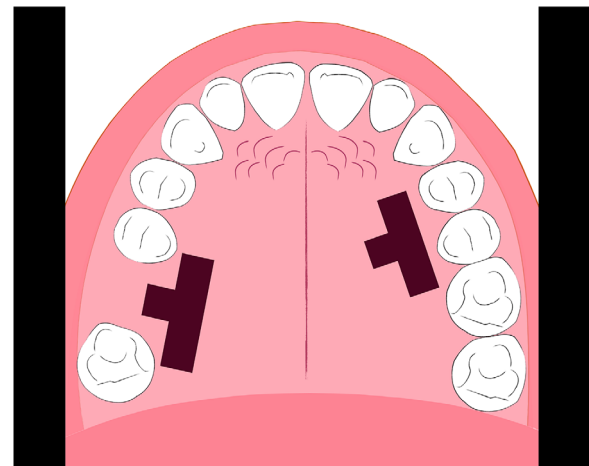


FIGURE 2 The inverted T-shape free gingival graft (FGG) either taking the advantage of the edentulous area with the base located inferiorly or with the base located superiorly as in the dentulous area.

related to teeth 23–26.⁸ A diagnosis of RT3 was given to teeth #23 and #24 (Figure 3A,B).

Surgical case management

The treatment plan was explained, and written informed consent was obtained before treatment. A composite splint was constructed after surgery. The preparation of the recipient site commenced by making a horizontal incision at the mucogingival junction (MGJ) as well as two vertical incisions extending to the adjacent teeth and about 3–4 mm beyond the MGJ. A sharp split-thickness flap was reflected, and the surfaces between these incisions were de-epithelialized (Figure 3C). Also, all the surfaces of the interdental papilla up to the lingual side were de-epithelialized using a 15c blade and microsurgical scissor.



FIGURE 3 A 43-year-old female. Clinical and radiographic examination revealed recession type 3 (RT3) gingival recession. (A) periapical radiograph showing the pattern and level of bone loss. (B) clinical photo showing the degree of the root recession, deficiency in width of keratinization, and high frenulum attachment with a diastema. (C) Vestibular incision with de-epithelization of the interdental papilla to increase the surface area of the recipient bed. (D) Free gingival graft (FGG) in the form of inverted T was harvested. (E) Site of the hard palate after graft harvesting with the extension in the superior edentulous area. (F) Inverted T FGG inserted between the teeth to cover interproximal tissue defect and sutured lingually into the lingual marginal gingiva. (G) immediate postoperative after suturing. (H) Two weeks follow-up showing the healing of FGG with the integration of the interproximal part (I, J) Six months follow-up, (K, L, M) One-year follow-up.

The exposed surface of the root was planned with hand instruments and rinsed with saline only.

The palatal donor site was designed 2 mm away from the gingival margin using the template in the form of an inverted T-shape and harvested from the palatal aspect of the maxillary molars (Figure 3D,E). Care was taken to obtain an even thickness of 1–1.5 mm. The final graft length was about 12 mm and the width was 4 mm with a 3 mm extension for interproximal papilla. In cases with full dentition, the 3 mm extension of the harvest should extend towards the mid-palatine raphe and stay at least 2 mm away from the marginal gingiva (Figure 1).

Next, the graft was contoured, adapted, and sutured at the level of the base of the interdental papilla (Figure 3F). The sutures were removed after 2 weeks (Figure 3G–I). For the first 3 weeks, the patient was advised not to brush at the surgical site, avoid hard food, and rinse once daily with 0.2% chlorhexidine digluconate mouthwash. Resuming gentle brushing using a soft toothbrush was allowed after. Post-surgical recalls were scheduled every other week during the first month and then every 3 months following the surgery (Figure 3J–M).

Case 2

Clinical presentation

A 49-year-old female patient presented at Al-Andalus private dental clinic, Tripoli, Libya in 2020 with the same chief complaint as case 1 in addition to some esthetic concerns. Teeth 24 and 25 had advanced horizontal bone loss within the coronal one-third of the root. The patient was a Generalized Stage II Grade B Periodontitis.⁸ The diagnosis of the mucogingival defect at teeth 24 and 25 were RT3 (Figure 4A–D).

Surgical case management

The same steps taken in Case 1 were performed here except at the donor site the design of the extension was at the palatal side with the base of the inverted-T at the gingival margin 2 mm away (Figure 4E–J). Composite restoration was made in this case to give an illusion of reduced interproximal space and to move the contact point apically, which gives an illusion of full papillary fill

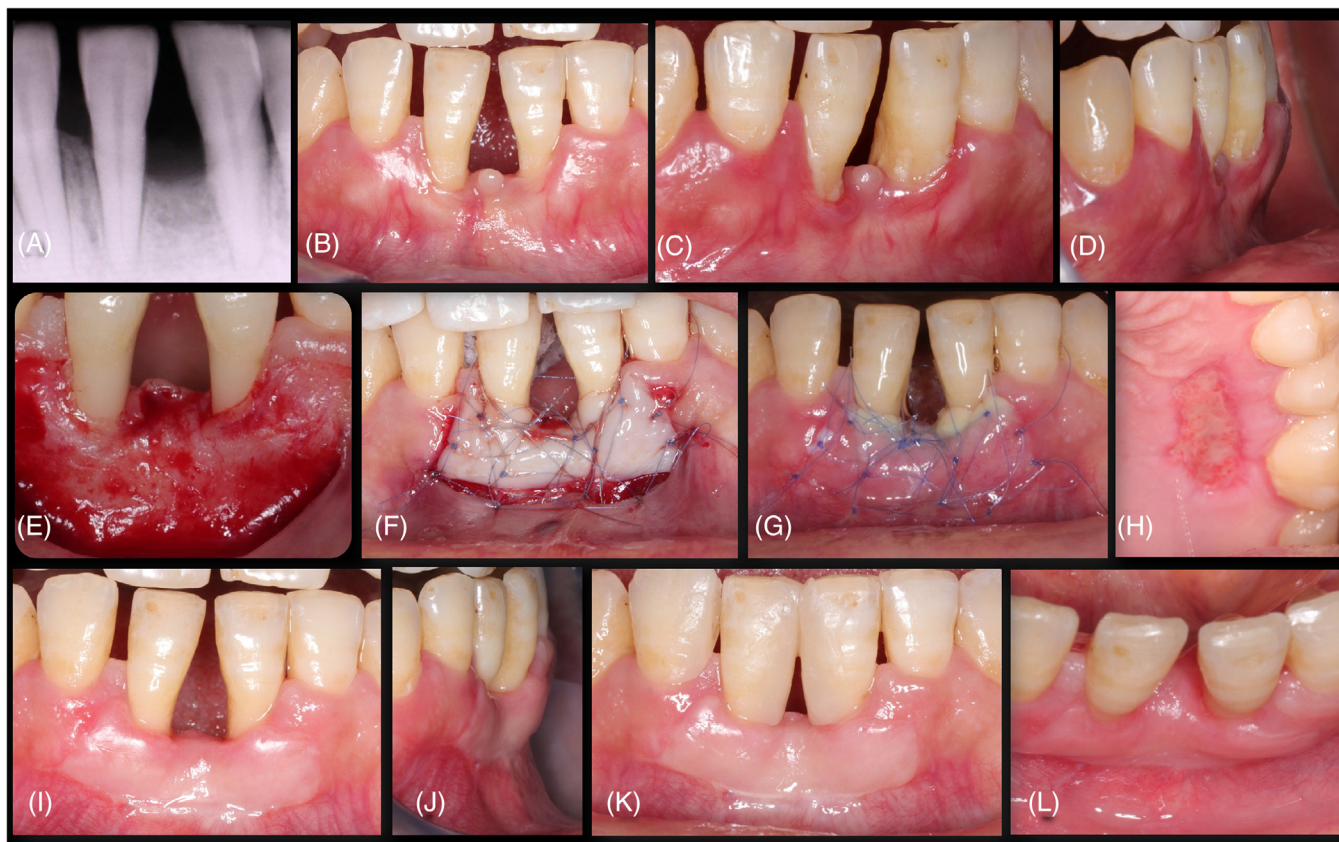


FIGURE 4 A 49-year-old old female. Clinical and radiographic examination revealed recession type 3 (RT3) gingival recession. (A) periapical radiograph showing the pattern and level of bone loss. (B–D) clinical photos showing the degree of the root recession, deficiency in width of keratinization, and high frenulum attachment, with a diastema from the front and lateral views. (E) Vestibular incision with de-epithelization of the interdental papilla until the lingual side to increase the surface area of the recipient bed and prepare the tissue for receiving the inverted T free gingival graft (FGG). (F) Inverted T FGG inserted between the teeth to cover interproximal tissue defect and sutured lingually into the lingual marginal gingiva. (G) Two weeks follow-up showing the healing of FGG with the integration of the interproximal part with slight marginal necrosis for the part over the root. (H) Two-week healing of the palatal donor site. (I, J) Six months follow-up. (K, L) One-year follow-up after restorative work to minimize the diastema between the roots

TABLE 1 Baseline and re-evaluation data for teeth numbers 24 and 25 in both cases

Parameters tooth no. 24 (mm)	After phase I therapy	After 3 months	Difference/gain	Parameters tooth no. 25 (mm)	After phase I therapy	After 3 months	Difference/gain
Case 1							
PD	2	1	1	PD	1	1	0
CAL	5	2	3	CAL	6	2	4
VR	3	2	1	VR	5	2	3
KTW	2	4	6	KTW	1	4	5
Case 2							
PD	1	1	0	PD	1	1	0
CAL	4	2	2	CAL	5	2	3
VR	3	2	1	VR	4	2	2
KTW	0	4	4	KTW	1	4	5

The tabular column shows the baseline and re-evaluation data for teeth numbers 24 and 25.

Abbreviations: CAL, clinical attachment level; KTW, keratinized tissue width; PD, probing depth; VR: vertical recession.

and may help future creeping of interdental papilla after its augmentation utilizing this technique (Figure 4K,L).

DISCUSSION AND CONCLUSIONS

Conventional FG is primarily to increase KTW and lengthen the vestibular depth and much less frequently for root coverage in select cases.^{5,9,10} Camargo et al. proposed that traditional thin FG grafts showed a high rate of success in the treatment of mild to moderate gingival defects.¹¹ The present case demonstrates an innovative technique based on further extension of the graft to increase its survival, which was described before by Allen and Cohen as a gingival unit graft or "GUG".⁶ Despite the severity of interproximal bone loss, this technique resulted in improved interproximal tissue quality, partial root coverage and increased KTW (Table 1). An important aspect of this technique is the presence of adequate interproximal space that allows the extension of the graft to the lingual gingiva and suturing it there. A previous study reported a reduction in recession, attachment, and KTW gain using GUG versus the conventional FG group.³ A randomized controlled trial done in 2020 showed that using a modified GUG for the treatment of Miller class III recession defects provided better defect coverage than conventional FG.⁹ Additionally, we noted that better improvement in vertical recession reduction at 1-year follow-up, thanks to the creeping attachment phenomenon.

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CONFLICT OF INTEREST

The authors declare they have no conflicts of interest.

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