



Case Report

Treatment of class-II recession with autologous connective tissue grafts using trapdoor technique

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ARTICLE INFO

Article history:

Received 25-09-2020

Accepted 25-10-2020

Available online 23-11-2020

Keywords:

Connective tissue

Grafts

Periodontal plastic surgery

ABSTRACT

This article describes the use of the sub epithelial connective tissue graft (SCTG) as a donor source for root coverage. The success of these grafts has been attributed to the double-blood supply at the recipient site from the underlying connective tissue base and the overlying recipient flap. The application of connective tissue grafts has become a widely accepted therapeutic option in aesthetically oriented periodontal plastic surgery. Connective tissue grafts are a versatile treatment method in periodontal plastic surgery and peri-implant soft tissue plastic surgery. Their strengths are ease of handling and good prospects of success. Harvesting techniques that are minimally traumatic but aimed at maximizing tissue volume ensure multi-purpose usability of connective tissue grafts.

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1. Introduction

Obtaining predictable root coverage has been a goal of reconstructive periodontal plastic surgery since a long time. Initially, the rationale for mucogingival surgery was function and health.¹ Eliminating recession has always been addressed but improving cosmetic appearance was not considered crucial.² The appearance of free gingival type graft that has been coronally positioned is not acceptable to many of esthetically minded patients.³ The amount of keratinized gingiva available is not adequate. The subepithelial connective tissue graft (SCTG) is a consistent technique to esthetically achieve predictable root coverage.⁴⁻⁷ This technique has the advantage of closer blend of the graft with the adjacent tissue avoiding the

“keliod” healing present with free gingival grafts. Since it was described by Edel in 1974, the technique has continued to develop in terms of its indication, usage and harvesting techniques. The purpose of this paper is to describe that SCTG technique can be used to gain total root coverage in isolated and multiple sites.

1.1. Case details

A 30 year male patient reported with a chief complaint of downward shifting of gums. On intra-oral examination gingival recession was present in relation to lower left central incisor with recession depths and widths of 3x3mm. A diagnosis of Miller Class II recession in relation to 31 was given. The patient was on maintenance phase (Phase IV) after phase I.

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1.2. Surgical procedure

Facial skin was scrubbed with 5% Povidine iodine before the surgical procedure. Patient was given local anaesthetic block with (2% lignocaine, 1:80000 adrenaline). A surgical template was made to measure the recipient site.

1.3. Technique

1.3.1. Recipient site

A partial thickness flap was created with two vertical incisions placed with at least one half to one tooth wider mesiodistally than area of gingival recession. The coronal margin of flap was started with horizontal sulcular incision to preserve all existing radicular gingiva. The interproximal papillae were left intact. The flap dissection was partial thickness leaving connective tissue over the existing bone and/or root surfaces. Care was taken to extend the flap to the mucobuccal fold without perforations which could seriously affect the blood supply. Periosteum was left covering the bone.

1.4. Donor site

A second surgical site was created on the palate. The length was determined by combined width of teeth to be covered. A horizontal incision was made approximately 5-6 mm from the gingival margins of the maxillary teeth to the desired. It was continued apically as an inverse bevel incision towards alveolar bone. A second parallel horizontal incision was made 1 1/2 mm to 2mm coronal to the first incision. The palatal bone was scored to enable the operator to remove the connective tissue wedge. The connective tissue and epithelium between the two horizontal incisions were excised and all adipose tissue is removed. Leaving an epithelial strip on the graft was originally intended to provide a better transition to the existing epithelial border when treating recessions (Langer and Langer, 1985, 1993). As the covering epithelium necrotizes within the first 5 days (Oliveret et al 1968; Langer and Bernimoulin, 1974) the underlying connective tissue determines the nature, shape and color of the newly formed epithelium (Charring et al 1975). Hence it is recommended in terms of predictability that no epithelial layer should be left on SCTG as shown in earlier publications (Langer and Calagna, 1980, 1982; Langer and Langer, 1985; Raetzke, 1985; Harris, 1992). If an epithelial strip is not harvested with the graft, access can be achieved with:

1. Single incision technique
2. Two (Angular Incision Technique)
3. Three (Trapdoor Technique)

In the present case, the trapdoor technique was done to achieve root coverage. It is advisable to suture the palatal flap back into position immediately after taking the donor

tissue in order to reduce the size of blood clot which might cause tissue necrosis.

The flap from donor site was closed into a position approximating primary intention healing. The donor connective tissue and epithelium were sutured to underlying connective tissue interproximally using 4-0 non absorbable surgical needled suture (Mersilk). The needle used was 16mm, 3/8 reverse cutting and interrupted sutures were given. The lip or cheek was then moved, checking to ensure that graft was well stabilized. The partial thickness, recipient flap was positioned coronally in a manner to cover as much of the graft as possible and sutured in this position. No attempt was made to completely cover the graft as this would create an excessive pull on the vestibular fold. The recipient site is dressed with periodontal dressing and the patient is instructed in normal post surgical management. A dressing is optional on the palate. The patient was instructed not to pull the lip back, not to tooth brush in the surgical site or chew firm food in the area for 2 weeks. Patients were started immediately on Chlorhexidine rinses twice daily for 10 days and use external ice packs for 48 hours. The patient was recalled at 1, 2 and 4 weeks interval. Some loose sutures were removed at 1 week and others at 2 weeks. (Figures 1, 2, 3, 4, 5 and 6 1A-1H). Healing was uneventful with no pain or discomfort to the patient. An overall of 90% root coverage was achieved. There was an increase in width of keratinized gingiva. As the postoperative time increased, the progressive adaptation of the edges of the flap to the surrounding tissue was observed.

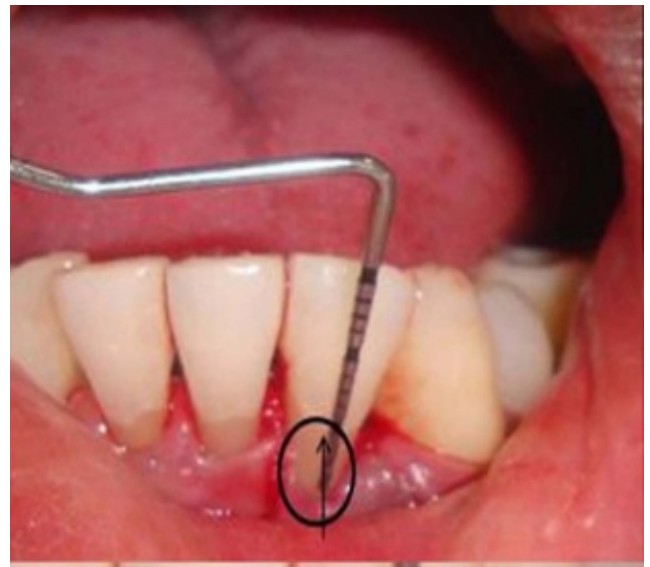


Fig. 1: 1A: Gingival recession (Class II) with depth and width of 3x3mm



Fig. 2: 1B: Scalloped papillary incision

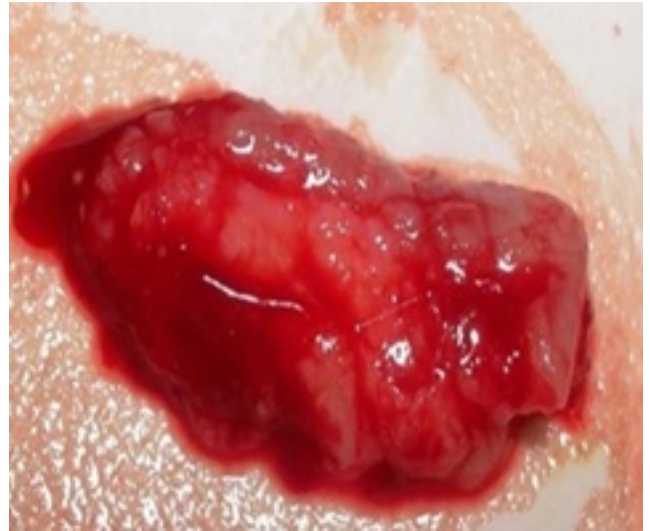


Fig. 5: 1E: Harvested sub-epithelial connective tissue graft



Fig. 3: 1C: Partial thickness flap raised with vertical incisions



Fig. 6: 1F Sutures placed



Fig. 4: 1D: Trap-Door Technique



Fig. 7: 1G: Recipient site (3 Months) 1x2mm



Fig. 8: 1H : Donor site showing healing following(3 month)

2. Discussion

The use of subepithelial connective tissue graft offers a combination of both pedicle flap and the free gingival graft. The pedicle flap allows for possible root coverage since it retains its apical blood supply and therefore survives over an avascular root surface. The free gingival graft supplies a resilient type of connective tissue with a genetic predisposition which ensures thickness and keratinization. The ability to combine both procedures offers the flexibility not achieved by either technique alone. If atleast one- half to two-third of the graft is covered by the flap, the remaining portion which is not covered will survive over the denuded root. The double blood supply i.e. that from the underlying periosteum and the overlying flap, seems to be enough to nourish the entire graft. The technique gains its clinical predictability by use of bilaminar flap (Nelson 1987; Harris, 1992) design to ensure graft vascularity and high degree of gingival cosmetics. Compared to free gingival graft, the donor site in this procedure heals with less discomfort since it is a smaller wound that heals by primary intention and usually does not require a periodontal pack. However excessive undermining of primary donor flap could lead to tissue necrosis and subsequent post-operative discomfort as described by Edel.⁸ To avoid “tire patch” look often associated with free gingival grafts (FGG) Jahnke and colleagues⁹ in 1993 compared FGG to SCTGs, and found the connective tissue grafts to be significantly ($p < .03$) more effective than FGG.

3. Conclusion

This procedure has the advantage of increasing keratinized gingival height, width and thickness. This technique allows an esthetic color match of the gingiva. Completed in one procedure and less traumatic donor sites versus a free

gingival graft. The collateral blood supply is adequate and hence no occurrence of flap sloughing. However this technique requires high degree of technical skill required, complicated suturing. Significant ecchymosis and edema have been experienced with this procedure.

4. Source of Funding

None.

5. Conflict of Interest

None.

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Cite this article: Sawhney A, Dwivedi H, Juneja M, Gupta B, Patil N, Vairat PP. Treatment of class-II recession with autologous connective tissue grafts using trapdoor technique. *J Dent Spec* 2020;8(1):30-33.