Pouch and Tunnel Technique for Root Coverage using Connective Tissue Graft – A Case Report

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ABSTRACT

Gingival recession is defined as the displacement and destruction of the soft tissue margin apical to cementoenamel junction. To minimize incision and reflection of flaps, Pouch and Tunnel technique can be used which also helps to provide abundant blood supply to the donor connective tissue into the pouch beneath papillary tunnels as well as allows intimate contact of donor tissue to the recipient site.

Keywords: Pouch and Tunnel Technique, Root Coverage, Connective Tissue Graft, Gingival recession

INTRODUCTION

Gingival recession is defined as the displacement and destruction of the soft tissue margin apical to cementoenamel junction. Obtaining predictable root coverage supported by a significant level of tissue regeneration has become an essential element of periodontal plastic surgery. Methods to achieve root coverage procedures include laterally positioned flap[1], Coronally Positioned Flap[2], Sub epithelial Connective Tissue Graft[3], Free Gingival GrafT[4], Guided tissue regeneratio[5], pouch technique[6]. Among these procedures connective tissue graft(CTG) + pouch & tunnel gives good aesthetic results.[7]

To minimize incision and reflection of flaps, Pouch and Tunnel technique can be used which also helps to provide abundant blood supply to the donor connective tissue into the pouch beneath papillary tunnels as well as allows intimate contact of donor tissue to the recipient site.

Advantages of pouch and tunnel technique

- Good blood supply to the graft
- Less tissue trauma
- Early healing
- Treating multiple gingival recessions in a single surgical procedure
- Good esthetics outcome

Free gingival grafts have a number of disadvantages. Esthetics may be compromised because of the colour difference between the graft and recipient site tissues, while there is also the problem of a large denuded site in the palate, which must heal by secondary intention. These disadvantages have been overcome by the use of connective tissue (CT) grafts, which involve placement of de-epithelialized connective tissue into the recession defect. Healing of the donor site is by primary intention, reducing discomfort for the patient. The colour match with the tissues is also better. Connective tissue grafts are commonly harvested from the palate, provided there is adequate thickness of tissue. The retro-molar pad area can also be used because of the thickness of the sub-mucosa in this area. This graft material is carefully sutured into place and a coronally advanced flap placed and sutured over it. Among the various surgical approaches used to treat gingival recession, connective tissue graft in combination with the coverage of the graft by overlying flap can be considered the gold standard for treating gingival recession defects[8]. Because the success and predictability of this surgical- technique, various modifications have been proposed, including connective tissue graft with or without epithelial collar, partially or totally covered by pedicle flap, with an envelope or tunnel design preparations covered by undetached papilla[9]. The main advantages of the connective tissue graft procedures are thought to derive from the availability of two sources of blood supply to the graft: one from the recipient bed and the other from the overlying flap, and the perfect chromatic integration and an optimal esthetic outcome[10]. Since the success rate of root coverage depends on the survival of graft tissue itself, it has been suggested that the overlying flap should cover most of the graft. This is thought to provide enough blood supply to nourish the underneath portion of the graft over the denuded root[11]. The proper flap design is also an important step toward obtaining satisfactory root coverage outcomes with connective tissue grafting approach. An envelope or a pouch flap design was proposed by Raetzke (1985)[6] eliminating vertical incisions. The advantages of the technique are the maintenance of the blood supply to the flap, a close adaptation to the graft, and reduction in postoperative discomfort and scarring. Allen (1993) reported the use of a technique where a connective tissue graft is placed in a tunnel preparation. This technique allows the maintenance of a greater thickness flap apical to the recession, which will cover the denuded root surface for multiple adjacent recession defects[12].

CASE REPORT

A female patient aged 23 years reported to the department of periodontics,SRM kattankulathur dental college with the chief complaint of lowering of gums. Clinical

examination revealed Millers class II recession in relation to 13,14,15 (Fig.1).The distance from CEJ to marginal gingiva was 3 mm in relation to 13 and 5mm in relation to 14. Root coverage using palatal connective tissue graft was planned.

Fig.1: Pre-Operative

PRESURGICAL PROCEDURE

Preparation of the subject includes scaling and root planing of the entire dentition and oral hygiene instructions. Detailed instructions regarding self-performed plaque control measures will be given. One week after phase I therapy, only those patients who maintained optimum oral hygiene are subjected to surgical procedure after recording all the baseline measurements. The surgical procedure was explained to the patient and an informed consent was obtained.

SURGICAL TECHNIQUE

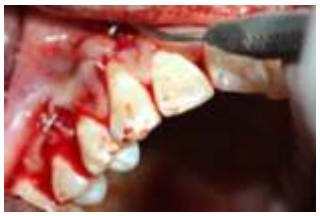

Fig.2: Creating a tunnel

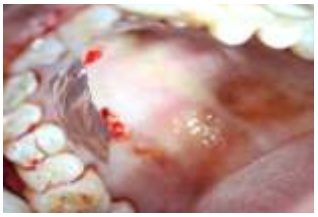

Fig.3: Donor site

After anesthetising the area, Sulcular incision was made around the teeth adjacent to recession. Using an orbans interdental knife and 15c blade (Fig. 2& 3), vertical incision was given mesial to 13 to create a tunnel beneath the adjacent papilla of 13,14,15, into which the connective tissue was placed. A split thickness pouch was created apical to papilla.

Fig.4: Harvested connective tissue graft

Fig.5: Graft in situ

A connective tissue graft was harvested from palate by using trap door technique. Tin foil was used to get the correct amount of connective tissue. Two separate sutures were utilised for sliding connective tissue graft. The suture needles were passed into the tunnel entering from mesial aspect of the interdental papilla of 13 and 14 and exit from the distal aspect of 14. With the graft held in position, it was pushed through the tunnel with a dull instrument (periosteal elevator) and pulled at the same time with the sutures from other end to place the graft in the pouch such that it covers the exposed root of both the teeth (13, 14,15). Simple interrupted sutures were placed to secure the graft at the recipient site.4 0 vicryl was used for suturing. Moderate pressure with sterile gauze dampened with saline was applied for five minutes to control bleeding in the palatal donor site and then sutures placed using simple interrupted sutures.4 0 vicryl and 3 0 silk was used for suturing.

Fig.6: Recepient site sutured

Fig.7: Donor site sutured

The patient was recalled after 4weeks for re-evaluation of donor and surgical site. The donor site appeared almost normal in colour and health after four weeks and the recipient site was healthy with excellent colour match with adjacent tissue. Complete root coverage was achieved in 14,15 where as in 13 recession was reduced to 1mm from 4mm postoperatively (Fig.no.8)

Fig.8: Post-Operative 4 weeks

DISCUSSION

The ultimate goal of any mucogingival surgery is predictable and esthetic root coverage. The advantage of using a subepithelial connective tissue grafts is that it provided significant root coverage, clinical attachment and keratinized tissue gain and is considered as a gold standard in treating recession type defects.[1] The tunnel procedure was used so that it preserves the intermediate papilla and may accelerate the initial wound healing. The tunnelling also applies less traction and preserves the gingival height.[2] Due to minimal trauma at the recipient site, the procedure may be of advantage in recessions as compared to the coronally repositioned flap.[3] The results of the tunnel procedure and its modification have demonstrated favourable root coverage in many studies.

Creeping attachment first described by Goldman13 Q is the increased gingival coverage over a denuded root surface that takes place over an extended period of time after surgery. Creeping attachment gives an additional coverage of 0.8mm on average in 95.5% of sites which provides the extra attachment needed for 100% root coverage.

The results in this case report indicated complete root coverage i.r.t 14 and 15 and recession was reduced to 1mm from 4mm i.r.t 13 post operatively. The remaining 1mm recession i.r.t 13 may also get reduce and attain complete root coverage over a period of time due to creeping attachment.

CONCLUSION

Pouch and tunnel technique gives early healing and less trauma to the tissue, connective tissue gives good colour match and attachment. Hence pouch and tunnel with connective tissue graft will be ideal for treatment of multiple gingival recessions.

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