Pouch and Tunnel Technique for Root Coverage using Palatal Connective Tissue Graft

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MJAFI 2008; 64 : 191-192

Key Words: Marginal tissue recession; Root coverage; Pouch and Tunnel; Liu's Classification

Introduction

Marginal tissue recession as a clinical entity has been documented since the last century. The earlier concept of a defined width of attached gingiva necessary to maintain oral hygiene does not hold true now [1]. It is essential to carry out root coverage surgery whenever concerns such as aesthetics, sensitivity, susceptibility to root caries, pulpal symptoms due to exposure of root, food lodgment and plaque deposition exist. Currently accepted procedures for root coverage include coronally advanced flap, free mucosal graft, sub epithelial connective tissue graft, guided tissue regeneration and acellular dermal matrix. The sub epithelial connective tissue graft have shown the best predictability (95%) of root coverage in Millers class I & II cases [2].

The tunnel technique followed in this case report is the one described by Langer et al [3], with a modification that includes placement of a vertical incision on one aspect of the tunnel to facilitate placement of the connective tissue graft.

Case Report

A 25 year old male patient reported with the complaint of sensitivity in relation to lower anterior teeth. On examination there was Miller's Class III recession in relation to 41 and 31. The distance from CEJ to marginal gingiva was 2 mm and 2.5 mm respectively. The width of attached gingiva was found to be inadequate in the region of 41 and 31 since the tension test was positive. Tension test is elicited by pulling the lips outwards to make the frenum taut and presence of mobility of gingiva with frenal pull is considered as positive. A pouch and tunnel technique utilising palatal connective tissue graft for root coverage was planned.

Root planning was performed in 31 and 41, the root convexity reduced and the region of 41 and 31 was anesthetised. A sulcular incision through each recession area

was given and the tissues were gently undermined, beyond the mucogingival junction so as to relax the flap sufficiently to allow placement of the connective tissue graft. Each pedicle adjacent to the recession was undermined gently without detaching it completely to prepare a tunnel (Fig.1). The undermining of tissues to prepare the tunnel was done by extending the undermining laterally 3-5 mm. The connective tissue graft which was harvested from the palate using Liu's Class II b incision [4] was placed and stabilized utilizing this extended tunnel (Fig. 2). Pressure was applied for five minutes to control bleeding and an acrylic stent with periodontal pack was placed.

Two separate sutures were utilised for sliding connective tissue graft. First suture was started from the mesial aspect of the tunnel and the second from the distal aspect. The needles were passed below the undermined papillae and both needles exit centrally. With the two sutures in place, using the same sutures the graft was stabilized by placing vertical mattress sutures in it. Both suture needles were then taken backwards through the tunnel close to the initial bite and taken out through new bites. 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 each end. Once the graft was completely in the tunnel, it was positioned coronal to the cemento-enamel junction. The ends were sutured with a simple square knot (Fig. 3). Mild compression with sterile gauze dampened with saline was applied for 5 minutes. Periodontal pack (Coe pack) was placed.

The donor site appeared normal in colour and healthy after four weeks and the recipient site was healthy with excellent colour match with adjacent tissues (Fig. 4). The tension test was negative. The postoperative vertical dimension of the recession in 41 was 0 mm and in 31 was 0.5mm. These results were stable and maintained at the end of five months. The mean root coverage achieved in this case was 90 % which is close to the mean root coverage of 91.6 % in the Zabaluigi study [5].

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Fig. 1 : Tunnel preparation

Fig. 2 : Connective tissue graft

Discussion

The problems of hypersensitivity, root caries and increasing interest in aesthetics, have led to surgical procedures that permit the coverage of exposed roots. The tunnel technique was developed as a modification of the envelope technique to manage multiple adjacent recessions [6]. The results of the tunnel procedure and its modification demonstrated favourable root coverage [5,7].

The use of tunnel procedure preserves the intermediate papilla and may accelerate the initial wound healing. The tunnelling also applies less traction and preserves the gingival height. Due to minimal trauma at the recipient site, the procedure may be of advantage in recessions as compared to the coronally repositioned flap. In this case we utilized one vertical incision to facilitate placement of connective tissue. The tunnelling technique combines the advantages of sub epithelial grafting along with envelope procedures thus improving the predictability. Thus the pouch and tunnel procedure is ideal for treatment of multiple adjacent recessions in a single surgical procedure demonstrating early healing and highly predictable root coverage results.

Fig. 3 : Suture replacement

Fig. 4 : CTG replacement

Conflicts of Interest

None identified

References

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