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Treatment of Adjacent Gingival Recessions with Subepithelial Connective Tissue Graft With Pouch and Tunnel Technique for Root Coverage - A Case Series

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Abstract

Over the past few decades, root covering techniques have undergone constant revision due to the growing demand for better aesthetics. With increased knowledge on the etiopathogenesis of gingival recessions and on the repair/regeneration of tunnelling procedure with subepithelial connective tissue (SCTG) has been possible and more predictable stable result.

The aim of this study was to evaluate the effect of SCTG by employing a pouch and tunnel technique as root coverage procedure. Five patients with maxillary teeth with miller's class I II gingival recessions were all the sites were treated using SCTG using pouch and tunnelling technique. Patients were presented for a period of 8 months. All the treated teeth showed 100% root coverage at 8 months.

Keywords: Periodontal Plastic Surgery, Gingival Recession, Subepithelial Connective Tissue Graft, Pouch and Tunnel Technique.

Introduction

The surgical techniques used to treat anatomical, developmental, or traumatic abnormalities of the gingiva or alveolar mucosa are referred to as periodontal plastic surgery.[1] Gingival recession is pathologic shifting of the marginal gingival apical to the cemento-enamel junction (CEJ) accompanied by the loss of alveolar bone, root cementum, and periodontal connective tissue fibers.[2]

Gingival recession is a frequent phenomenon that becomes more prevalent as increases with age. It may result in reduced aesthetic appeal, clinical issues, and aesthetic concerns.

Cervical abrasions, root caries lesions, aesthetic demands, and root hypersensitivity are the primary

indications for root covering procedures. For the aforementioned issues, root covering surgery is therefore required.[3]

Gingival recession might worsen to the point where it may jeopardize the tooth's future if left untreated. There several methods for root coverage have been suggested. Coronally positioned flap, the double papilla flap, the semi lunar coronally positioned flap, the free gingival autograft, the subepithelial connective tissue graft.

The subepithelial connective tissue graft has demonstrated the highest root coverage prediction in Miller's class I and II instances. This method reduces traction, accelerates the initial wound healing, and protects the intermediate papilla. Compared to other techniques, this procedure may be beneficial in treating gingival recession.[4]

Subepithelial connective tissue grafts (SCTG) in conjunction with tunnel technique are common periodontal procedures for the treatment of gingival recession.[5]

In order to increase the width of keratinized gingival, Edel (1974), Broome and Taggart (1976), and Donn (1978) were the first to use connective tissue grafts. In 1985, Langer and Langer described the SCTG technique for covering gingival recession of both single and multiple adjacent teeth. They described a technique in which the graft is covered by the overlying partial thickness flap. Nelson suggested using a full thickness flap to cover the SCTG.[6]

Raetzke introduced the "Envelope technique," an alternative method of connective tissue grafting, in 1985.[9] In 1994, Allen proposed the "Tunnel or supraperiosteal envelope technique," which is a variation of Raetzke's method, to treat many adjacent to gingival recessions.[7]

This case series outlines the advantages of SCTG using pouch and tunnel procedure, as outlined by Allen in 1994, for treatment of multiple gingival recessions over other treatment modalities.

Materials and Methods

Five patients were recruited from Department of Periodontics, Navodaya Dental college and hospital, Raichur. All patients who were to receive a pouch and tunnelling flap for root coverage were required to meet the following inclusion criteria: Maxillary anterior teeth and premolars with Miller's Class I recession which was ≥ 2 mm at the maxillary incisors, canines, or premolars. normal alignment of teeth in the arch, systemically healthy non-smokers with no systemic diseases; age at least 22 years and willingness to give informed consent. Exclusion criteria included Root surface restorations, Root caries, Trauma from occlusion, abnormal frenal attachment.

The present case included a 25-year male -old patient reported with the complaint of sensitivity in upper anterior teeth region. (Figure 01) The other patients included of 35-year-old male patient, 28-year-old patient, 32-year-old patient, 29-year-old patient.

On examination, Miller's Class I gingival recession was present in relation to 11 and 12. The width of attached gingiva was found to be adequate in the region. A pouch and tunnel technique utilizing palatal connective tissue graft for root coverage was planned based on the indications stated above.

Presurgical Protocol

At baseline Gingival recession, Clinical attachment level was recorded from the cementoenamel junction (CEJ) to the deepest point of the gingival sulcus with a William’s periodontal probe. Width of keratinized tissue was measured from the mucogingival junction to the free gingival margin with a William’s periodontal probe.

Routine periodontal therapy, scaling and root planning was carried out. Oral hygiene instructions were given to each patient and patients were recalled after 4 weeks for the surgical procedure.

All surgical procedures were performed by the same surgeon. The surgical procedure, adapted from Allen, began with local anaesthesia 2% lidocaine with a concentration of 1:200000 epinephrine of local anaesthesia was administered. Sulcular incisions through each recession area were given with a number 15 blade (figure 02). Care was taken not to extend the incisions till the tip of the interdental papilla. A full thickness mucoperiosteal flap was reflected, extending beyond the mucogingival junction. This was done to reduce flap tension and facilitate coronal displacement after graft placement. Each pedicle adjacent to the recession was undermined gently, without detaching it completely to prepare a tunnel. The undermining of tissues to prepare the tunnel was done by extending it laterally about 3-5 mm (figure 03).

SCTG was obtained through Lui's class I incision from the palate. The incision (figure 04). was made between mesial aspects of I molar to the distal aspect of canine following the harvesting of the graft (figure 05), the gauze soaked in saline was placed at the graft donor site to control bleeding Subsequently the palatal flap was sutured and the stent was placed.

The mesial aspect of the graft was pierced. The mesial side of the graft was penetrated with a needle, which was then carefully maneuvered beneath the tunnel formed between the neighbouring recessions a gently advanced in a distal direction using a periosteal elevator, allowing the graft to be positioned beneath the tunnel. (Figure 06). The graft was placed coronally to the cementoenamel junction (CEJ). Following its placement, the graft was anchored to both the mesial and distal sides with sling sutures to ensure stability and prevent any displacement of the graft (figure 07). Periodontal dressing was placed over the foil to stabilize and protect the donor tissue (Figure 08).

Discussion

Gingival recession has become a prevalent issue in contemporary dental practice, necessitating intervention to avert additional complications. Historically, periodontal treatment focused primarily on the prevention and management of existing periodontal diseases. However, with the rise in aesthetic expectations, these surgical techniques have evolved to not only address health concerns but also to improve and maintain aesthetic outcomes through various periodontal plastic surgical methods. Periodontal plastic surgery encompasses procedures aimed at enhancing aesthetics, restoring form and function, and incorporating regenerative techniques as well.

Achieving consistent root coverage has emerged as a crucial aspect of periodontal treatment. Numerous surgical methods have been explored to attain this goal. However, certain techniques may yield disappointing outcomes. The underlying factors for these unsatisfactory results may include inadequate case selection, inappropriate choice of technique, insufficient preparation of the root, lack of adequate height in the interdental bone and soft tissue, subpar surgical execution, and inadequate blood supply from adjacent tissues due to insufficient preparation of the recipient site, as well as issues related to flap penetration.

The free gingival graft, coronally advanced flap, use of barrier membranes, EMD, various growth factors etc., SCTG has become a popular treatment modality for coverage of denuded roots because of its high degree of success. The clinical benefits of SCTG are evident not only at the recipient site, where there is effective

integration of tissues, but also at the palatal donor site. This technique employs a more conservative method for graft harvesting, resulting in a lower level of discomfort for the patient.[8]

The effectiveness of these grafts is ascribed to the dual blood supply present at the recipient site, which originates from both the underlying connective tissue base and the overlying recipient flap. This technique can achieve complete root coverage in both isolated and multiple areas. Histological assessments indicate that the application of Subepithelial Connective Tissue Graft (SCTG) over recession defects leads to periodontal regeneration.[9,10]

In present cases, This report presents five successful cases of root coverage with SCTG using the Pouch and Tunneling technique in maxillary anterior and/or premolar teeth

All the surgical sites treated using the pouch and tunnel technique achieved a remarkable 100% root coverage. The outcomes of the tunnel procedure indicated positive results in terms of root coverage. This technique not only preserves the papillary height between two mucogingival defects but also ensures a sufficient blood supply to the underlying graft. Furthermore, it facilitates excellent graft adaptation to the recipient site, yielding highly aesthetic results and contributing to an increase in the thickness of keratinized gingiva.

Conclusion

Gingival recession poses a significant practical and aesthetic problem. The preferred surgical method is determined by a number of parameters, each of which has pros, cons. The surgeon should select the least traumatic surgical procedure for the patient from the various available protocols. Every stage of the process, from case selection to long-term maintenance and patient compliance, is crucial to the success of any root covering surgery. Results from SCTG using the pouch and tunnel technique are considerably superior, more reliable, and offer more benefits.

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Legend Figures

Figure 1: Pre Operative - Miller's Class I gingival recession with respect to 11 and 12

Figure 2: Crevicular incisions given

Figure 3: Pouch and tunnel prepared

Figure 4: Incision given on the palate

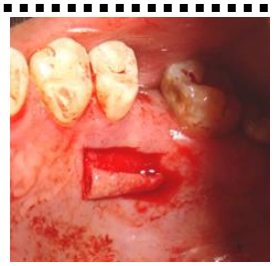

Figure 5: subepithelial connective tissue graft harvested from palate

Figure 6: graft placed in the pouch

Figure 7: Suture placed

Figure 8: Periodontal pack placed

Figure 9: 100% root coverage at 8 months