

Sub-Epithelial Connective Tissue Graft: A Gold-Standard Root Coverage Procedure

¹Dr. Shilpi Shah, ²Dr. Mishal Shah, ³Dr. Shivakshi Desai

¹Professor and Head of the Department, ²Reader, ³Post-Graduate Student

¹Department of Periodontics and Oral Implantology,

¹Ahmedabad Dental College and Hospital, Gandhinagar, India

Abstract : Esthetic smile comprises of harmony, balance and continuity of form. Functional abnormalities like dentinal hypersensitivity and esthetic concerns are most often associated with gingival recession defects. The main goal of the root coverage procedure is to restore the function and gingival esthetics in recession. There was a strong correlation found between the severity and extent of gingival recession associated with orthodontic treatment. It was suggested that orthodontic tooth movement might be associated with the gingival recession. The main aim of this case report is to illustrate the relationship between the gingival recession and orthodontic treatment and the successful outcome of using tunnel technique of sub-epithelial connective tissue graft (SCTG).

Keywords : Gingival recession, Esthetics, Sub-epithelial connective tissue graft, Tunnel technique

I. INTRODUCTION

Esthetic smile includes harmony, balance and continuity of form. Gingival recession within the esthetic zone is a primary disruptor of these properties and often must be corrected if an esthetic smile has to be achieved^[1]. Periodontal plastic therapeutic surgical techniques are primary tools for correcting such defects. The prima facie of reconstructive therapy is the restoration of health, function, and esthetics, which often requires correcting gingival recession defects within the esthetic zone. The etiology of gingival recession is multifactorial i.e., tooth malposition; inadequate tooth brushing; destructive periodontal disease, occlusal trauma; high muscle attachment and iatrogenic factors related to reconstructive, periodontal, orthodontic, or prosthodontic treatment. Among these, a strong correlation was found between the severity and extent of gingival recession to orthodontic treatment and it was suggested that orthodontic tooth movement especially beyond labial or lingual alveolar plate, may lead to a gingival recession.

Langer and Langer^[2] in the year 1985, introduced sub-epithelial connective tissue graft, achieving a high success rate by combining the advantages of both free gingival and pedicle grafts. As far as the predictability and esthetics are concerned, this technique has been proposed as "Gold Standard". Raetzke^[3] described the envelope technique to place the CTG without vertical incisions required in a coronally positioned graft. Zabalegui et al^[4] were the first to combine these techniques in the treatment of multiple adjacent gingival recession defects by the use of a mucosal partial-thickness "tunnel," to introduce CTG. Recently, the incorporation of specialized microsurgical periodontal plastic protocols and instruments for the application of similar techniques in reconstructing gingival defects was suggested by Zuhr et al^[5].

The main aim of this case report is to illustrate the relationship between the gingival recession and orthodontic treatment and the successful outcome of using tunnel technique of sub-epithelial connective tissue graft (SCTG).

II. CASE REPORT:

A 25 years old male patient was referred by department of orthodontics to the department of periodontics for evaluation and treatment. His chief complaint was aesthetic concern associated with the lower front tooth. His general health condition was good, did not take any medications, had no known allergies and was a non-smoker. Upon evaluation, Millers class II gingival recession was associated with mandibular left central incisor on the buccal surface extending 6mm apical to the CEJ and a narrow zone of attached gingiva was found (figure 1). On the mesial and distal aspects of the incisor, there was no reduction of papilla height. No gingival recession was associated with adjacent teeth. Hence, was decided to treat this case with sub-epithelial connective tissue graft.



Fig 1: pre-op



Fig 2: pre-op after bracket removal



Fig 3: Tunnel preparation on right lateral



Fig 4: Tunnel preparation on left lateral



Fig 5: recipient site measurement



Fig 6: Donor site measurement



Fig 7: Donor site incision



Fig 8: Harvested graft



Fig 9: De-epithelization of harvested graft



Fig 10: Graft placed on recipient site



Fig 11: Suturing done



Fig 12: Periodontal dressing given



Fig 13: Donor site sutured with Abgel



Fig 14: Hawley's appliance delivered



Fig 15: 1 month post-op recipient site



Fig 16: 3 month post-op recipient site



Fig 17: 1 month post-op donor site



Fig 18: 3 month post-op donor site

III.SURGICAL PROCEDURE:

The exposed root surface was carefully planed and was gently irrigated with a sterilized saline solution. After local anaesthesia with 2% lignocaine with epinephrine 1:80,000 a recipient bed was prepared for the graft, a horizontal incision was made at the level of CEJ to the base of adjacent papilla to the line angles of the neighboring teeth and the tunnel was created using Bard-Parker no. 15 blade (figure 3,4). The measurement of the recipient and donor site was done using aluminium foil (figure 5,6). The graft was harvested from the donor site by first placing the incision perpendicular to the root surface followed by the horizontal incision (figure 7). The harvested graft was then de-epithelized (figure 9).

Before placement of the graft, root conditioning was done with tetracycline hydrochloride and the grafted tissue was then compressed for about 5 min onto the recipient bed (figure 10). An effort was made to place the coronal margin of the graft in correspondence to the CEJ. The graft was then sutured over the defect with a resorbable suture (figure 11). The donor site was sutured with Abgel (figure 13) and Hawley's appliance was delivered (figure 14). The recipient site was given with periodontal dressing (figure 12). The patient was prescribed with analgesics and instructed to rinse twice daily with 0.2% chlorhexidine mouthwash for 2 weeks post-operatively and to avoid trauma and pressure at surgical site. The Periodontal dressing was removed after 10 days of surgery. At the 2-week postoperative visit, oral hygiene and plaque control was reviewed and reinforced. Professional prophylaxis was performed at the end of one month and then at three months postoperative. The affected had been completely healed three months following the surgery (figure 17,18). The amount of attached gingiva was adequate and the probing depth at mid-buccal site was less than 2mm.

IV.DISCUSSION

The case described hereby illustrates the orthodontic treatment as the potential cause of gingival recession defect and attachment loss. The primary disruptor of the properties of esthetic zone is gingival recession, which often needs to be treated in order to achieve aesthetic smile. Periodontal plastic surgeries are the clinician's tools for correcting such defects. The main advantage of the connective tissue graft is the bilaminar blood supply to the graft: one from the recipient bed and the other from the overlying flap and an optimal esthetic outcome^[6]. The number one advantage of a surgical solution to denuded roots, if it is achievable, is the ability to minimize restorative intervention in many instances. In addition to regaining an esthetic gingival profile through root coverage, the increased zone of keratinized, attached gingiva creates a more maintainable periodontal environment, usually with

significantly less sensitivity. Wennström^[7] in 1996 reported an average of root coverage using connective tissue graft is 89% ranging over 50%-98%. Mutthineni et al.^[8] reported that the vitality and high survival potential of subepithelial connective tissue graft are achieved by sources of the blood supply from the gingival flap.

Although technique sensitive, The tunnel technique is an approach that optimizes esthetics and predictability because of its ability to avoid releasing critical papillae and maintaining a high level of vascularity at the surgical site to support the grafts.

V.CONCLUSION

From the case report, it can be concluded that orthodontic treatment may be responsible for causing gingival recession defects. Root coverage procedures are the best for the treatment of such cases aiming to restore both the aesthetics and function of gingiva.

The extent and predictability of root coverage procedures for the treatment of recession defects are dependent on the quality of the vascularity that is maintained at the surgical site. The tunnel, or envelope technique optimizes vascularity by eliminating the need for vertical releasing incisions. Furthermore, when adjacent recession defects are present and are connected by an esthetically critical papilla, the tunnel technique is an excellent approach to protect the positional height of the papilla. Tunnel technique is a successful and predictable method that optimizes esthetics and predictability by maintaining a high level of vascularity at a surgical site to support the grafts.

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