

Application of Fibrin Sealant in the Treatment of Root Coverage Procedure - A Case Report

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Abstract: *Suturing is considered to be an important part in periodontal surgery. One requires skills, it is time consuming, difficulty in maintaining plaque control and can often cause discomfort to the patient. Sometimes loosening of suture may also occur which can impair the wound healing of the tissue which can negatively impact the outcome of the surgery. To overcome this newer technique have been introduced one such is tissue adhesive called fibrin glue. Fibrin sealant can be prepared from the patient's own blood (autologous) or derived from donated blood which mimics the final stages of coagulation with better healing and good stability after flap closure by stimulating blood clotting mechanism. This case report shows the use of commercially available fibrin glue and its role in tissue adaptability and wound healing in the treatment of Miller's class II gingival recession of a single tooth.*

Keywords: Gingival recession, fibrin sealant, tissue adhesives, mucogingival surgery.

1. Introduction

The ultimate goal of periodontal surgery is to prevent further progression of periodontal and to restore the lost periodontium and promote early wound healing. The main objective is to obtain better surgical outcome and early wound healing [1]. Several products have been used to aid in periodontal surgical procedures which could promote early wound healing and tissue regeneration. One such kind of product is the fibrin sealant which imitates biologic tissue adhesive. It effectively seals tissue and eliminate possible spaces and function as a natural wound bed mimicking the final stage of blood coagulation and act as a scaffold promoting proliferation and differentiation of mesenchymal and endothelial cells [2].

AIM: The aim of this case report is to describe the use of fibrin sealant as a tissue adhesive in single Miller's Class II gingival recession for root coverage and to increase the width of attached gingiva

2. Material and Method

2.1 Clinical presentation

A 21 - year - old male, not smoker, presenting Miller's class I gingival defect in correspondence of the mandibular right central incisors, was referred for a periodontal evaluation (Figures 1 and 2). His main complaint was tooth hypersensitivity. He was systemically healthy to undergo periodontal surgery. The treatment plane was aimed at partial root coverage with increasing width of attached gingiva.

2.2 Case management

After signing a written consent, patient received nonsurgical periodontal therapy, including supra gingival and sub gingival scaling and oral hygiene instructions. Surgery was performed

under local anesthesia, using lignocaine with adrenaline (1: 100.000).

Preparation of recipient site:

The mucogingival surgery planned was tunnel and pouch with connective tissue graft technique. Intrasulcular incision was made using 15c blade on the recipient on the mesial and distal aspect and a pouch was created with respect to 41 using a tunneling instrument extending beyond the mucogingival junction (fig 2). Collagen fibers were separated and released from the inner aspect of the flap and root planing was performed. As a result of this procedure flap could be advanced coronally without tension.

Preparation and management of donor site:

After preparation of the recipient bed a template for the graft was prepared using a tin foil. Harvesting of connective tissue graft was done using single incision on right palate aspect extending from 1st premolar to 1 molar. The donor site flap was secured using interrupted 4 - 0 black silk sutures.

Management at recipient site:

Application Fibrin sealant was performed on root surface of tooth using injectable syringe (fig: 4). The graft was placed into the pouch and gentle pressure was applied for 3 - 4 minutes to stabilize the graft on the root surface. The flap was the coronally advance and secured with 4 - 0 vicryl suture (Ethicon) (fig: 6). Periodontal dressing was placed to protect the operated area from contamination.

Post operative management:

Patient was prescribed with Antibiotics (Amoxicillin 500mg TDS) and Analgesics (Enzo flam TDS) for a period of 5 days. Patient was not to brush or floss the surgical site for at least 2 weeks and was advised 0.2% Chlorhexidine mouthwash twice daily to be used 2 days after the surgery for maintain the oral hygiene. Suture removal at the donor (palatal) site was done after 7days after evaluating wound healing. Suture recipient site was removed after 14days

postoperatively and was advised tooth brushing with ultra - soft toothbrush using charter's technique.

3. Results

Two week after post - surgery the recipient bed showed formation of new capillaries which can be evident through the appearance to fiery red colour of the gingiva (fig: 7). The texture soft tissue and blending were equivalent to the adjacent tissues with intact papilla was observed at two months with subsequent increase in keratinized tissue (fig: 8). Reduction in recession depth clinical attachment gain and root coverage was observed 2 months post operatively (fig: 10). Healing on palatal site was excellent without any scar formation (fig: 11). The surgical site demonstrated root coverage, increase in both gingival thickness, width of the keratinized gingiva better colour matching with the adjacent tissue.

4. Discussion

To the best of our knowledge, this surgical technique has never been reported before. Adaptation of the graft is very crucial factor in which could determine the soft tissue thickness augmentation as well as the root coverage. Graft stabilization using fibrin sealant is to provide effective adhesion between connective tissue and the recipient site. They possess properties like tissue adhesiveness, wound healing through fibrin clot formation, mechanical strength and stability. Fibrin sealant is a naturally derived tissue adhesive and is well tolerated by most individuals with minimal inflammatory reactions in few cases [3].

Fibrin sealant facilitates proper stabilization and adhesion to graft over recipient site by preventing formation of dead space [4]. The presence of fibrin sealant also promotes clot formation for better healing. Better healing could be attributed to appropriate approximation, retention of wound edges and stabilization of fibrin clot to achieve hemostasis. It is mainly attributed to three components which are fibrinogen, thrombin and aprotinin This helps in biological, chemical, and physical bonding with the collagen present in the dentin tubules, consequently improving the stability of the fibrin clot [5]. Thrombin helps in conversion of fibrinogen into fibrin by activation of factor VIII and speed up the formation of blood coagulum. The clot is maintain by presence of aprotinin which prevents fibrinolysis and enhances the healing by prolonging the life of fibrin mesh. It accelerates revascularization and migration of fibroblasts at recipient bed. This enables it able to establish stable epithelium - connective tissue interface and making connective tissue more resistant to proteolytic enzymes [5, 6]. In The present case report improved wound healing was observed at recipient site as well as in the donor site with no inflammation. After removal of pack grafts and flaps were

more fixed and stable with no signs of necrosis which results in a better healing at 1 or 2 weeks after surgery. The better fixation n is due to fibrin sealant being able to seal the whole under surface than just the marginal fixation possible with sutures. The application of fibrin sealant requires less skill while providing firm adhesion by smooth adaptation of flaps to the tooth surface resulting in reduced plaque accumulation.

5. Conclusion

In the present case, adjunctive use of fibrin sealant along with suture resulted in better clinical and esthetic outcome. Better wound healing resulted in improving c/clinical attachment level, root coverage and increased amount of attached gingiva

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Figure 1: Pre operative showing Miller' class II gingival recession



Figure 2: Pouch created at recipient site using tunneling instrument



Figure 3: Connective tissue graft harvested from palate



Figure 4: Fibrin sealant application over root surface



Figure 5: Connective tissue graft placed at recipient site



Figure 6: Suture placed with fibrin glue to secure flap



Figure 7: follow up after 14 days

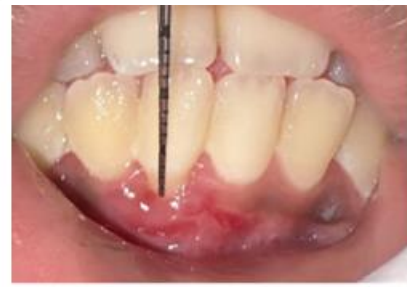


Figure 8: 1 month follow up



Figure 9: 1 month follow up



Figure 10: 2 months follow up



Figure 11: Fibrin sealant kit with injectable syringe