

The “Gum Drop Technique” - A Minimally Invasive Approach to Counter the Recession Coverage Dilemma - A Case Report

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Abstract

Dentistry is evolving rapidly in the current era and as technology drives surgical techniques to become minimally invasive, patients prefer procedures that have lower morbidity and post-operative discomfort. The Gum Drop Technique (GDT) is a novel soft-tissue grafting procedure introduced by Delia Tuttle to achieve root coverage and increased keratinized tissue. This is a combination of minimally invasive incisions and blood derivatives from the patient. This technique demonstrates favorable healing without the need for a donor site to provide connective tissue. This papilla-preserving approach offers the benefits of an autogenous, biologically enhanced procedure

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Received Date: Jun 27, 2019;

Accepted Date: Jun 06, 2019;

Published Date: Jul 22, 2019

Publisher: Scholars Insight Online Publishers

Citation: Gautam R, Paramashivaiah R, Venkatesh Prabhuji ML. The “Gum Drop Technique” - A Minimally Invasive Approach to Counter the Recession Coverage Dilemma - A Case Report. *Ann Dent Oral Biol.* 2019; 1:101.

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Introduction

Root recession a common problem encountered in routine dental practice, presents as an esthetic issues, root sensitivity and root caries. Many root coverage procedures have been described in the literature with varying degrees of success. Free gingival auto grafting was introduced in the early 1980s by Miller [1,2]. Various flap techniques to achieve desired root coverage were explored by numerous authors including Matter [3], Marggraf [4], McGuire [5], Laney et al. and others [6]. Autogenous connective tissue grafting remains the gold standard for root coverage. Though it's predictable it requires a secondary donor site which can lead to increased pain, morbidity, and inadequate tissue for quadrant or full arch grafting. Modifications for the traditional techniques were done to avoid the above complications and a minimally invasive technique called as “tunnel” technique was introduced by Mahn in 2001 [7].

Biological factors such as growth factors and proteins have been utilized as monotherapy or as combination agents to enhance wound healing. The blood-derived concentrates such as Platelet-Rich Plasma (PRP), Platelet Rich Fibrin have been extensively explored for soft and hard tissue healing owing to the presence of various growth factors, leucocytes and platelets enmeshed in the fibrin matrix. They have been utilized to promote tissue regeneration and alveolar bone repair of extraction sockets to ridge augmentation for defect correction and implant site development [8,9]. Apart from being autologous in nature, it has other added advantages like enormous release of growth factors, anti-inflammatory property and not requiring biochemical blood handling that was necessary with PRP. The present trend is more towards a minimally invasive surgical approach. Thus both of these treatment concepts have been merged to introduce the “Gum Drop Technique” to promote tissue engineering for recession coverage.

Description of the Case

A 38 year old female patient presented with the complaint of sensitivity in the maxillary right quadrant. Examination noted Millers Class 1 and 3 recession on the 22 and 23 respectively (Figure 1). Noted were the blunted papillae which may decrease root coverage success. Pulpal involvement was not noted and sensitivity was related to the exposed root surfaces.

Pre-surgical preparation

Non surgical periodontal therapy was performed and oral hygiene instructions were reinforced. After 4 weeks patient was recalled to assess the oral hygiene maintenance and the inflammation with 22 and 23 (FDI SYSTEM OF TOOTH NUMBERING).The gum drop technique was planned for the root coverage.

Surgical procedure: the gum drop technique

1. A-prf preparation: Prior to surgery, peripheral blood was collected in 10 ml vials tubes without anticoagulant and immediately centrifuged to 1300 rpm for 8 minutes. After the physiological coagulation, the fibrin clot was separated from the red blood cell component base using scissors and tweezers and A-PRF membranes were obtained (Figure 2).

2. Mechanical and chemical root decontamination was performed prior to surgery using scalers, diamond fine burs and EDTA for a duration of 3 minutes. Good oral hygiene is verified (Figure 3).

3. After local anaesthesia administration the surgical procedure is performed by proceeding with a small gum piercing using the tip of the needle of the syringe to create a hole comparable with a laparoscopic procedure in medical surgeries. One hole was made in the alveolar mucosa near the base of the vestibule, apical to the recipient site

(between 22 and 23). This was followed by the microsurgical instrument to increase the size of the piercing (Figure 5).

4. The microsurgical instrument was inserted through the entry incision to elevate a full-thickness flap along the tooth sparing the tip of the papilla (not detached from the underlying bone) Elevation of the flap was guided by visualization of the shape and movement of the instruments through the tissue (Figure 6).

5. A-PRF membranes are introduced inside the elevated tissue. The gums are advanced coronally towards the CEJ and a tension free flap release is performed and stabilized with sutures (Figure 7).

6. Coronally Advanced Flap (CAF) is maintained using an apical mattress suture. Resorbable 5.0 sutures was used to maintain the flap in close contact with root proximity for at least 3-4 weeks. The composite bonded at the interproximals acts as stabilization points for the sutures.



Figure 1: Recession with 22 and 23.



Figure 4: Pinhole made in vestibule.



Figure 2: A-PRF prepared 1300rpm for 8min.



Figure 5: Full thickness flap elevated using microsurgical instrument.



Figure 3: Mechanical treatment of rough surfaces on root using diamond burs.



Figure 6: Insertion of PRF membrane in the prepared tunnel.

To predictably achieve 100% root coverage, it has been recommended that tissue needs to be advanced 2 mm or more coronal to the tooth's CEJ [10] (Figure 8).

Follow ups

The patient was regularly followed up at an interval of 4 weeks and 8 weeks (Figures 9). Healing was assessed and Root coverage was measured at the end of 8th week.

Results

Satisfactory healing and near complete root coverage was observed.

Discussion

Gingival recession is a commonly encountered in daily dental practice and has been treated by various surgical approaches. The GDT addresses the goals of root recession coverage with a biological approach to reduce inflammation during healing, stimulate healing and provide long-term stability of the repositioned gingival margin.

Normal regeneration has been shown to require cell death as the tissue must sense an injury, initiate a regenerative response, and then properly direct growth [11-13]. The growth factors released from platelets and leucocytes will stimulate new vessels growth through VEGF (vascular endothelial growth factor) and FGF (fibroblast growth



Figure 7: Coronal advancement of flap done and sutures placed.



Figure 8: 4 Weeks follow up.



Figure 9: 8 weeks follow up-up.

factor) and will stimulate the PDL to obtain new attachment. Periodontal ligament contains fibroblast cells, epithelial cells, undifferentiated mesenchymal cells, and cementum cells. Vascularization is the key for the success of any grafting procedure and depends on the blood supply. VEGF and PDGF (platelet derivative growth factor) are responsible for angiogenesis. PDGF is also a mitogen for cells of mesenchymal origin including fibroblast. Additionally, the concentrated fibrin component acts like tissue glue holding hard-tissue graft material together into a moldable material and making it adhere to the underlying bone and overlying soft tissue. The PRF membrane when used in soft-tissue procedures, binds the tissue into position, allowing improved healing and better immobilization of the flap with reported accelerated wound and site healing [14]. The CEJ is often difficult to identify in patients presenting with cervical lesions as these are missing enamel and cementum. In addition, Miller Class III and IV gingival recessions may require vestibuloplasty in some cases to allow sufficient tissue to coronally place that is tension free and may need to be performed before coverage of the root recession. The results of our case report are similar to the results obtained in a case series done by Tuttle et al. [15].

Conclusion

The Gum Drop Technique is a new biological approach involving blood derivatives combined with precision minimally invasive surgery demonstrates faster healing without the need of a donor site and acceptable root coverage. The morbidity of Gum Drop Technique is less and patient case acceptance is higher compared with the traditional grafts. Long term studies with large sample sizes are required to confirm the results.

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