

Periodontal Plastic Surgery: Treatment of a Gingival Recession using a Tunnelling Technique, Connective tissue graft and amelogenins

A clinical case report

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Abstract

The therapeutic approach to gingival recession requires a treatment plan involving basic therapy, which will focus on its etiologies and the

most suitable periodontal plastic surgery treatment in each specific case.

The Oral Biofilm control, previous periodontal stabilization, the use of magnification and microsurgical instruments to handle the tis-

sues, bilaminar blood supply for the connective tissue graft, the release of the lower anterior frenulum, the root conditioning with enamel matrix derivative proteins, suture without tension and patient cooperation were key factors in the

treatment outcome obtained.

The aim of this paper is to present a clinical case of a gingival recession defect treated using a tunnelling technique with a connective tissue graft and amelogenins and its evaluation.

Introduction

Gingival recession (GR) has been defined as the exposure of the tooth root caused by the migration of the gingival margin to a point apical to the cemento-enamel junction. It can appear in its localized or generalized form and frequently compromises dental and gingival aesthetics, and causes dental hypersensitivity (1,2).

GR has a multifactorial etiology associated with different types of factors that aid their development. It has been demonstrated that at least four groups of factors can be associated with the development of GR: anatomical factors (lack of keratinized gingiva, muscle insertion close to gingival margin, inadequate tooth alignment, thin or absent vestibular table, prominent root); factors relative to inflammatory disease (Gum disease because of plaque build-up, Periodontitis); factors relative to iatrogenesis (e.g. prosthetics, orthodontic treatment); factors relative to trauma (traumatic brushing or other mechanical traumas) (3).

The elimination of causal factors and the detailed explanation provided to the patient are as important as the periodontal plastic surgery technique to implement (4-6).

According to the first European Periodontal meeting consensus in 1994 the indications for GR treatment are

- Improvement of oral hygiene (prevention of gingivitis and root caries);
- Esthetic or orthodontic concerns
- Hypersensitivity.

The root exposed in a GR is not necessarily compromising the tooth survival if the remanent bone is preserved and the oral biofilm is controlled. However, from a periodontal point of view, is indicated to treat it when is progressive and/or difficult a correct oral hygiene (Freedman and cols, 1999).

In the last decades many surgical techniques for the treatment of GR have been developed (Sullivan & Atkins 1968, Langer & Langer 1985, Raetzke 1985, Allen 1994, Zabalegui 1999 among others).

The most widely accepted classification of gingival recession is Miller's. It is based on the most apical gingival margin of the recession regarding the mucogingival junction, and on the amount of tissue loss (gingiva and bone) in interproximal areas adjacent to the recession site (7).

Complete coverage is achieved when the gingival margin is placed at the same level as the cemento-enamel junction, the gingival sulcus has a probing depth lower than 2 mm and when there is no bleeding on probing (8). The outcome of surgical treatment of gingival re-

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Fig 1. Initial Situation. Lower Anterior Sextant.



Fig 4. Two Weeks after starting with basic treatment



Fig 2, 3. Post-Op situation after Basic Periodontal treatment.



Fig 5. Pre-Surgical situation. Lower anterior Sextant.



cession is expressed as success (i.e. the average percentage of root that has been covered). The type of recession according to Miller's classification influences the outcome of the surgical procedure. Factors related to the surgical technique used - tissue tension, flap thickness - may also influence the treatment results (Pini Prato et al. 2000)

This paper reports a clinical case of a 6 months follow up after a modified coronally advanced tunnel and connective tissue graft (Subepithelial) + enamel matrix derivative proteins (Straumann Emdogain) to treat a multiple lower anterior gingival recession.

Clinical case description

A systemically healthy 35-year-old female patient, a nonsmoker, was referred to our Clinic. Her chief complaints were root sensitivity, discomfort and pain when brushing the lower anterior teeth.

The patient underwent orthodontic treatment between 2003 and 2009. The symptoms she relates started after such treatment. Upon examination, the following was observed on lower anterior sextant:

Miller's class II gingival recession in tooth #31 that showed a 2,5mm width and 4mm depth; Class I #41,32 showing 2 mm x 2mm. Localized gingival inflammation and tartar accumulation in the root surface #31, 41, Thin periodontal biotype, Lack of attached gingiva. (Figure 1)

Diagnosis and suggested treatment plan was explained in detail to the patient: basic periodontal therapy and periodontal plastic surgery - Modified coronally advanced tunnel technique (MCAT) in this case (Zuhr et al. 1999, Aroca et al. 2010, Sculean et al. 2014, 2015) + connective- tissue graft and enamel matrix derivative proteins. Other grafting material options such as xenografts and allografts were discussed.

The basic therapy included:

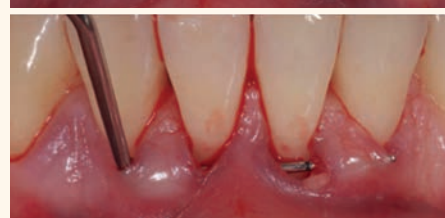
Instructing the patient regarding dental plaque control, tartar removal (Fig. 2,3), prophylaxis and use of a soft toothbrush and of the necessary interproximal cleaning devices for each sector. This therapy lasted four sessions, once a week and the results can be seen in Figure 5.

The surgical technique selected was a tunneling technique (MCAT) + connective tissue graft harvested from the palate. This surgical approach has the advantage of not incising into or reflecting many of the papillae within the surgical site, thereby minimizing the risk of losing papilla height in critical areas.

The surgical procedure was performed under



Fig 6, 7. Preparation of the recipient site according to the tunneling technique



local anesthesia. Scaling and root planning was performed at all teeth scheduled for root coverage. Thereafter, a mucoperiosteal flap was raised using several tunneling knives beyond the mucogingival junction, maintaining interdental papillae intact, thus creating a tunnel flap (Figs 6,7). The tunnel was then extended apically and laterally in a split flap, sectioning and releasing all attached muscle and collagen fibers from the inner aspect of the flap. After gentle undermining but not disruption of the interdental papillae, the tunnel flap was mobilized so as to allow complete coronal tension-free advancement. Root conditioning using EDTA 24% 2 minutes (PrefGel) and enamel matrix derivative proteins (EMD) was performed.

A sub-epithelial connective tissue graft (SCTG) was taken from the palate. The single-incision technique was used to remove the graft (Fig. 8,9) and soaked in EMD for 5 minutes. The donor area was sutured with suture 5/0 Seralon.

The SCTG was introduced into the recipient site and fixed using 7-0 and 6-0 Prolene suture.

This surgical approach has the advantage of not incising into or reflecting many of the papillae within the surgical site, thereby minimizing the risk of losing papilla height in critical areas.

The patient was instructed to take Ibuprofen 600mg 30 min before surgery, 6 hours after and every 12 hours as necessary during the following days and to use mouth-rinse (0.12% chlorhexidine digluconate) twice a day for 15 days. Sutures in the donor area were removed after 1 week and all the rest 14 days after the procedure.

The patient was followed up weekly during the first month and monthly up to the third month. Healing was uneventful. The patient did not report pain or major discomfort during the postoperative period. The color of the tissues was homogeneous 2 weeks following the surgical procedure (Fig. 10,11). Six months after the treatment, gingiva stability and thickness seem adequate, which shows good hygiene of the sector and gingival tissue stability achieved with the graft. (Fig. 12, 13)



Fig 8, 9. Sub-Epithelial Connective Tissue graft Harvested From the palate. Detail of the Connective tissue graft impregnated with the amelogenins (Straumann Emdogain).

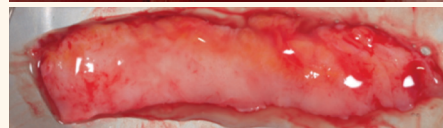


Fig 10, 11. Post-Op Situation after 14 days. Prior to suture removal. Good tissue blending and colour were observed



Fig 12. Follow up 6 months



Fig 13. Follow up 6 months. Occlusal view



Fig 14. Comparative initial to 6 months situation

Conclusions

Successful treatment outcomes requires the analysis of all the etiological factors. Basic periodontal therapy is fundamental when treating gingival recession. Appropriate oral hygiene techniques should be implemented. In cases where the recession causes aesthetic concerns or root hypersensitivity, surgical treatment should be recommended. Subepithelial connective tissue grafts are the gold standard in periodontal plastic surgery as they modify tissue thickness, increase keratinized gingiva and improve root coverage. The MCAT can lead to predictable recession coverage of single and multiple recessions. Periodontal maintenance is essential to avoid inflammatory events which might increase recession recurrence.

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Primarily graduating from the University Alfonso X el Sabio, Madrid with a degree in Dentistry, Laura also has a Master's Degree in Periodontics and Implant Dentistry at the University of Catalunya.

Alongside these accolades, she attained an advanced course in Implant Dentistry and Prosthodontics from Loma Linda in the USA and a Diploma in Aesthetic Dentistry from the University of Gotemburg.

After almost a decade working in Madrid, Spain, my husband and I embraced the exciting challenge of moving to Dubai, and I was fortunate enough to join the amazing team at Dr. Roze & Associates Dental Clinic – allowing me to work with passion, every day. In my spare time, I enjoy traveling, dancing and going to the beach. I also love spending time in Dubai with my family, my husband and my son."