Management of gingival recession defects - a case report

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Introduction
Gingival recession, referring to the exposure of the root of a tooth caused by loss of gingival tissue and/or apical displacement of the gingival margin from the cemento-enamel junction (Wennersten 1996), is a common clinical observation. According to Kasah et al. (2005), more than 50% of the population exhibits gingival recessions. Gingival recession has a multifactorial etiology associated with anatomical factors or pathological factors (Figure 1). Plaque-related inflammation and traumatic brushing have been considered primary or triggering factors in gingival recession. Furthermore, predisposing factors have also been identified: bone fenestration and dehiscence, position of the tooth within the dental arch, thickness of the marginal gingiva, high attachment of the labial frenulum, high attachment of the gingiva to the tooth, and inappropriate positioning related to force, direction, or dental tipping and inappropriate restorations.

Gingival recessions can be localized or generalized, involving one or more tooth surfaces. Among various classifications proposed to describe the clinical features of gingival recessions, Miller’s classification (Miller 1985) of gingival recession is probably the most widely used. This classification, based on (i) the height of the interproximal papilla and interdental bone adjacent to the defect area, and (ii) the relation of the gingival margin to the mucogingival junction (Figure 2), allows for a relatively reliable prediction of the outcome of treatment.

The exposure of the root surface is generally associated with aesthetic issues, a radicular hypersensitivity as well as difficulties to maintain an optimal buccal dental hygiene (Susin et al. 2004, Daprile et al. 2007). In many cases, these symptoms may require treatment.

Treatment
Treating gingival recessions is a challenge for the dental practitioner who must consider the objective clinical signs, subjective symptoms, and the patient’s expectations regarding the treatment outcome.

The management of gingival recession is based on a thorough assessment of the degree of tissue involvement and the etiological factors. The control of the causative factors in the development of gingival recession should always be addressed during the initial treatment phase and will in most cases prevent further progression of the recession. Vigorous brushing should be addressed by advising patients to carry out an appropriate brushing technique (i.e. modified Bass technique) with a soft/medium toothbrush, a less abrasive dentifrice. When tooth mispositioning is a contributing factor, appropriate consideration to orthodontic correction should be considered. If the recession is related to a piercing, its removal should be recommended. If the recessions have been successfully stabilized by identifying and avoiding causative factors, and by eliminating hypersensitivity, no further treatment might be needed. However, in cases of objectionable aesthetic alterations, progressive recessions, or increased hypersensitivity, surgical correction using mucogingival plastic surgical techniques such as gingival grafting should be considered.

The objectives of gingival grafting are (i) to provide a degree of root coverage and (ii) to enhance the amount of keratinized attached gingival tissue around the tooth. While the latter of these two objectives is very predictable, the amount of root surface coverage may vary depending on the severity of the recession defect. Periodontal plastic surgery is a technique sensitive and involves delicate handling of the mucogingival tissues, demanding a great dexterity of the surgeon, a selection of specific instruments and innovative surgical and suturing approaches. The use of magnification and microsurgical instruments to handle the tissues improves vascularization of connective tissue grafts and increases root coverage compared to macroscopical techniques (Burkhardt & Lang 2005, Cortellini et al. 2007).

Two main types of periodontal plastic surgical procedures have
been described in the literature to treat the gingival recessions.

- Pedicle soft tissue graft procedures

A pedicle graft involves repositioning donor tissue from an area adjacent to the recession defect to cover the exposed root surface (coronally advanced flap, laterally sliding flap, bipapillary flap, tunneling technique). These techniques have many advantages as no second surgical site is needed and as the flap retains its own vascularization from the base of the flap. To minimize tissue trauma and thus improve the aesthetic result, these surgical techniques have over the years been modified and improved (Bartke et al. 1985, Allen 1994, Brunski 1994, Zauchelli and De Sanctis 2000). The use of enamel matrix derivatives (e.g.,Straumann Emdogain®) in conjunction with a coronally advanced flap procedure increases the rate of success and predictability (Cairo et al. 2008).

- Free soft tissue graft procedures

A free soft tissue graft is indicated when there is no acceptable donor site present in the area adjacent to the gingival recession defect or when a tacker marginal tissue is desirable. This surgical approach requires a donor site, which is usually the maxillary palatal mucosal tissue. The commonly used graft techniques include (i) an epithelialized flap (Figure 3) and (ii) a sub-epithelial connective tissue graft (Figure 4) placed either with a pedicle or using a tunneling technique. Connective tissue grafts substitute materials like Geistlich Mucograft® (Sanz et al. 2009, Araco et al. 2015) may be useful in situations where a large recession defect needs to be treated and graft tissue harvested from the palate would provide an insufficient volume of tissue (Figure 5).

The outcome of surgical treatment of gingival recession is commonly expressed as success rate (i.e., the 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 (Pai et al. 2000, Hwang et al. 2006). Many authors consider that gingival grafting is less successful in smokers than in non-smokers (Trombelli et al. 1997, Bocuzzi et al. 2002, Erley et al. 2006). The present article reports a clinical case after a 2-year follow-up in which a coronally advanced flap was used in combination with a sub-epithelial connective tissue graft and enamel matrix derived proteins (Geistlich Mucograft®) to treat a single gingival recession.

Clinical case

A 50-year-old male patient was referred to our Clinic for evaluation and treatment of a single gingival recession defect at tooth #13. The patient presented palatal systemic health and non-smoker. He brushed his teeth with a hard-bristled toothbrush using horizontal motions. His chief complaints were esthetics and root sensitivity. The clinical examination revealed a plaque index (PI) of 8%, and a gingival index (GI) of 5%, with a 3 mm probing depth. Tooth recession inclines were aplasia and of tooth #12 was noticed. At first examination (baseline), tooth #13 showed a 5 mm large and 4 mm deep class I Miller’s type buccal gingival recession defect (Figure 6a). The gingival recession defect was caused by anatomic features associated with traumatic tooth-brushing.

The patient, who refused orthodontic treatment, underwent teeth polishing, oral hygiene instructions, and a periodontal probe brushing technique (i.e., modified Bass technique), using a soft-bristled toothbrush. After 1 month, coronally advanced flap was proposed in association with a sub-epithelial connective tissue graft and the adjunctive use of enamel matrix derivative proteins (Straumann Emdo- gain®) aiming for root coverage of tooth #13.

Receptor Site Preparation

Following local anesthesia, the exposed root surface was sealed. A surgical incision was then made through the buccal aspect of the tooth with a #8899 Carbide bur then extended horizontally towards the adjacent interdentinal area at a distance of about 2 mm. Two divergent, vertical, diverging releasing incisions were performed (Figure 6b). Split-thickness flaps were elevated on both sides of the recession and continued in full thickness for an extension that corresponds to the amount of flap displacement (Figure 6c). The selected area extended to the alveolar mucosa and a periosteal incision was performed in the most apical portion to eliminate tension and allow the coronal displacement of the flap (Figure 6d). The buccal aspect of the interdental papilla was de-epithelialized distally and medially in order to secure anchorage of the flap onto a connective recipient site.

Root conditioning

Root conditioning using Strauman® Instagraft® (Straumann, Basel) was performed on the root surface for 2 minutes (Figure 6f). After aspiration and saline rinse. The root surface was then air-dried and Straumann Engo- gain® applied from the apical to the coronal part of the exposed root surface (Figure 6g).

Donor Site Preparation

The second step was to harvest a sub-epithelial connective tissue graft from the palatal mucosa. The selected area extended from the distal aspect of the right first premolar to the mesial aspect of the right first molar. The single-incision technique was used to remove the graft. The graft was removed with a thickness of 1.5 mm (Figure 6g) and the palatal site was stitched with single sutures.

Graft Positioning and Suturing

The graft was positioned under the flap and over the exposed root surface of tooth #13 and secured with 60 Proleure® sutures. The buccal flap was then coronally advanced and sutured and secured with 60 Proleure® sutures (Figure 6h). Straumann Engo-gain® was applied over the gingival margin for 5 minutes to enhance soft tissue healing (Figure 6i).

Postoperative Instructions

The patient was instructed to take analgesic medication (paracetamol, 750 mg) three times a day for 4 days and a 0.12% chlorhexidine di- gluconate twice a day for 15 days. All sutures were removed after 14 days (Figure 6j). The patient was followed up weekly during the first month, monthly up to the third month, and annually up to the second year.

Clinical Evaluation

The healing process was uneventful, and the patient did not report pain or discomfort during the overall postoperative period. The color of the tissues was homogenous 2 weeks following the surgical procedure. Esthetic improvements were observed 12 months postoperatively (Figure 6k) and were maintained during 2 years of follow-up (Fig- ure 6l). No scabs were noticed. A full coverage of the recession, a gain of keratinized tissue and an increase in the tissue thickness were observed.

Conclusion

Gingival recession is a common clinical observation. Underlying etiological factors to recession should always be investigated and addressed. Appropriate oral hygiene instructions and other preventive techniques should be reviewed. In cases where the recession is more significant, causing aesthetic concerns or ongoing problems with root hypersensitivity, surgical treatment should be recommended. Due to the highly specialized nature of mucogingival surgery and the fact that root coverage procedures are very technical sensitive, patients requiring surgical correction of recession defects should be referred to a periodontist for management.

References

2. Miller FD. (1997) Root coverage results (FDTA 24%).