June 2017

Five-year follow-up of a coronally advanced flap over grafted bone and restorative composite in maxillary recession defect.

Syeda Mahvash Hussain
Aga Khan University

Farhan Raza Khan
Aga Khan University, farhan.raza@aku.edu

CASE REPORT

Five-Year Follow-up of a Coronally Advanced Flap Over Grafted Bone and Restorative Composite in Maxillary Recession Defect

Syeda Mahvash Hussain and Farhan Raza Khan

Abstract

Periodontal plastic surgery has become a predictable method of managing gingival recession defects. In the current case report, a five-year follow-up of a coronally advanced flap surgery with bone graft along with endodontics and fixed prosthodontic rehabilitation is reported in the maxillary anterior sextant of a middle aged female. The present case demonstrates that deep and wide gingival defects can be treated with coronally positioned surgical flap without a connective tissue graft. A multidisciplinary management approach was adopted in this case that yielded predictable outcome.

Key Words: *Gingival recession. Periodontal attachment loss. Bone graft. Flap.*

INTRODUCTION

Gingival recession is defined as the apical migration of the free gingival margin away from the cemento-enamel junction (CEJ), leading to an eventual exposure of the root surface dentin.[1] The prevalence of gingival recession is reported as high as 85% in a population with high standards of oral hygiene.[2] The clinical presentation of gingival recession is mostly in the form of sensitivity to hot and cold food and beverages and an aesthetic concern, especially if it occurs in the maxillary anterior teeth. This problem is further highlighted, if the patient has a high smile line and a thin gingival bio-type.[3]

It is difficult to manage recession defects with just one treatment modality.[2] Such recession defects are generally managed with conservative approach, including hygiene maintenance and desensitizers or sometimes placement of restorative materials.[3,4] However, periodontal plastic surgery procedures, such as coronally repositioned flap with or without connective tissue graft, have shown promising results.[4]

This case presentation is 5-year follow-up of a multi-disciplinary management of recession defects at the maxillary anterior teeth using coronally positioned flap along with bone graft, a synthetic resorbable membrane placed concomitantly with endodontics and prostho-dontics.

CASE REPORT

A 51-year lady patient with no known comorbids presented to the dental clinics of the Aga Khan University Hospital, Karachi, Pakistan, in May 2010 with a complaint of sensitivity to hot and cold beverages and food catching around her upper fixed prosthesis. On clinical examination, it was observed that she had a six-unit metal ceramic fixed bridge (from tooth #13 to #23), placed by another dentist a few years earlier. The teeth #12, #11, #21 and #22 were missing, for which she got that prosthesis made. She was not satisfied with the appearance of her prosthetic teeth and wanted an aesthetic solution to her problem. There was marked gingival recession along with root exposure in tooth #13, (classified as a Miller's Class II gingival recession, based on clinical and radiographic examination) and Class I Miller's defect in tooth #23. The facial cervical margins of the pontic surfaces of the existing prosthesis were bulky. This added to the unaesthetic appearance of the prosthesis (Figure 1). Periodontal assessment showed the gingival biotype was thick, bleeding on probing was positive along with tenderness on percussion on both abutment teeth. Smile analysis revealed a gummy smile with a high lip line and the patient had a Class II malocclusion with a deep bite.

After a thorough clinical and radiographic examination, two treatment plans were devised for the patient. Plan A

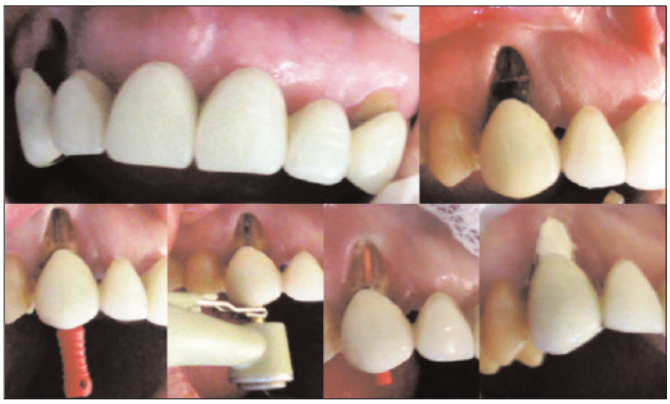

Figure 1: Preoperative and intraoperative images.

Department of Operative Dentistry, Aga Khan University Hospital, Karachi.

Correspondence: Dr. Farhan Raza Khan, Assistant Professor and Head Dentistry Department, Aga Khan University Hospital, Karachi.
E-mail: farhan.raza@aku.edu

Received: August 29, 2016; Accepted: February 17, 2017.

was a relatively aggressive but offered a more predictable outcome. It comprised of extraction of teeth followed by placement of implants and fixed metal-ceramic prosthesis. While Plan B was a more conservative approach but had a guarded prognosis. It comprised of root canal treatment, restoration of the root lesion with a suitable composite material and covering the recession defect using a coronally repositioned flap, followed by replacement of the faulty fixed prosthesis with a new six-unit metal ceramic bridge. Knowingly that the prognosis was guarded, the patient still consented for Plan B.

The treatment started by performing single visit endodontics followed by installing a prefabricated bonded postcore (translucent quartz-fibre posts, RTD, France and flowable composite, 3M-ESPE, USA) for tooth #13 through the existing prosthesis. Rubber dam was not used for endodontics because obtaining good isolation in such a large gingival defect was not possible and that too through the existing fixed metallo-ceramic bridge; therefore, cotton rolls were used instead. The facial radicular defect was then filled using light cure composite material (P-60 hybrid composite, 3M-ESPE, USA). Alginate impression was taken for the construction of a vacuum-formed stent. The existing prosthesis was then sectioned and discarded and a temporary prosthesis was made from self-cure resin (Integrity, Dentsply, USA) using the pre-made stent. This was cemented in place, after refining the underlying margins of the existing abutments. The facial margin of the restoration had to be kept on the composite material. This was one of the limitations that could not be bypassed.

Next step involved the periodontal plastic procedure in which a full-thickness muco-periosteal flap was raised under local anesthesia. The visible surface of the restorative composite was then roughened using a diamond bur and then surface treated with Ethylene Diamine Tetra Acetic Acid EDTA (RC-PREP, Premier Inc, USA) for two minutes. Nearly a quarter gram of allogenic irradiated cortico-cancellous particulate bone graft (Rocky Mountain Tissue Bank, USA) was packed over this prepared defect. Synthetic and resorbable collagen membrane was placed over the graft material and the flap was sutured with a coronal advancement. The entire flap and graft assembly was stabilized by placing simple interrupted 4-0 vicryl sutures.

Postoperative instructions were given and the patient was sent home with a prescription of Amoxicillin with Clavulanic acid, 1g twice daily, for six days and Flurbiprofen 100mg twice daily for five days with an advice to have a follow-up after seven days. On follow-up visit, the healing was progressive and the patient was pain-free. Sutures were removed and another recall visit was scheduled after one month.

At this appointment, the existing temporary prosthesis was modified so that the cervical margins would closely adapt to the current soft tissue contour. This was done by bonding a little composite resin at the cervical part of the canine and the gingival surface of the central and lateral incisors (pontic teeth) of the existing temporary prosthesis. Under local anesthesia, the gingiva on the alveolar ridge that touches the pontic surface of the bridge was subjected to electro-cautery using a loop tip to gain a shallow concavity in the gingiva with an objective of achieving aesthetic emergence profile.

The patient was then scheduled for a follow-up after five weeks of the first surgery. Impressions for the definitive prosthesis were made using addition type silicone putty-wash material (Aquasil, Dentsply, USA). The casting trial was done along with bite registration. Bisque bake trial was done to carry out occlusal adjustments and the final prosthesis was cemented using glass ionomer based adhesive. The patient was planned for a recall follow-up after six months of the first surgery and then annually to assess for periodontal status. At 6 months, the results were satisfactory and stable.

At the 5-year follow-up of surgery, it was observed both clinically and radiographically that the prosthesis was in situ, functioning well without any inflammation around it (Figure 2). The patient had maintained immaculate oral hygiene, thus there were no hard or soft deposits of calculus around the prosthesis. There was no bleeding on probing and the clinical attachment levels were within normal limits. However, a pinpoint drop in the probing depth of nearly 8mm was observed at the distobuccal line angle of the tooth #13 and a 4mm probing depth at the mesiobuccal line angle of tooth #23 was seen. Despite these findings, the patient was symptom-free; these two sites did show bleeding upon probing. The margins of the prosthesis were intact, both clinically and radiographically (Figure 2); and no gingival recession was seen around them. The percussion and palpation test for both the abutments were negative and the mobility was within physiological limits.

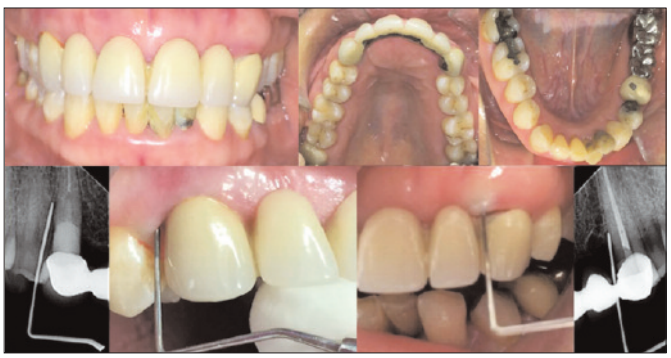

Figure 2: Postoperative images at five-year follow-up of single coronally reposition flap surgery without connective tissue graft over bilateral maxillary canine gingival recession defects.

DISCUSSION

The multifactorial etiology of gingival recession constitutes a restorative challenge. Success lies not only in correct diagnosis and management, but maintenance of the oral hygiene by the patient. Management of gingival recession initially requires an oral environment that is stable and disease-free because a progressive periodontal disease is a contra-indication for periodontal plastic surgery procedure.

Harris *et al*. showed 98% mean root coverage was sustained at 2-year follow-up on patients who had Miller Class I and II defects.[5] There are several surgical techniques documented in literature for correcting gingival recession, but the gold standard is the combination of a sub-epithelial connective tissue graft with a coronally advanced flap.

The coronally advanced flap was first described by Bernimoulin and colleagues in 1975.[6] According to them, this procedure could either be a single-stage or a double-stage procedure depending on the gingival bio-type and availability of the width of the attached keratinized gingiva. Since the patient described in the present report had a thick gingival bio-type and her width of the keratinized gingiva was adequate; therefore, a single-stage procedure was selected. As there was an adequate vestibular depth; therefore, it was decided not to use a sub-epithelial connective tissue graft during coronally repositioning over the recession defect.

Chambrone *et al*. reported in their systematic review that if the gingival recession defect was less than 4 mm, there was generally a better percentage of complete and mean root coverage.[7] Studies show that with a single-stage coronally repositioned flap, the mean root coverage achieved is between 55-99%,[8] and complete root coverage varies from 24-95% of the sites.[9]

Pini-Patro *et al*.[10] proposed that if 100% root coverage is required, then the coronally repositioned flap should be overcompensated by 2 to 2.5mm and should be sutured tension-free. In most clinical circumstances, this is difficult to achieve. These are cases where the sub-epithelial connective graft plays a pivotal role and can augment to counter the recession defect.

The presented case demonstrates success at five-year follow-up of gingival recession. It showed that deep and wide gingival defects can be treated with single coronally repositioned flap without a connective tissue graft. The key to success here was adopting a multidisciplinary management and maintenance of excellent oral hygiene by the patient.

REFERENCES

1. Glossary of periodontology terms. American Academy of Periodontology. 4th edition, Chicago; 2001.
2. Matas F, Sentís J, Mendieta C. Ten-year longitudinal study of gingival recession in dentists. *J Clin Periodontol* 2011; **38**:1091-8.
3. Bouchard P, Malet J, Borghetti A. Decision-making in aesthetics: root coverage revisited. *Periodontol 2000* 2001; **27**: 97-120.
4. Cairo F, Nieri M, Pagliaro U. Efficacy of periodontal plastic surgery procedures in the treatment of localized facial gingival recessions. A systematic review. *J Clin Periodontol* 2014; **41**: S44-S62.
5. Harris RJ. Root coverage with connective tissue grafts: An evaluation of short- and long-term results. *J Periodontol* 2002; **73**:1054-9.
6. Bernimoulin JP, Lüscher B, Mühlemann H. Coronally repositioned periodontal flap. *J Clin Periodontol* 1975; **2**:1-13.
7. Chambrone L, Sukekava F, Araújo MG, Pustiglioni FE, Chambrone LA, Lima LA. Root-coverage procedures for the treatment of localized recession-type defects: a Cochrane systematic review. *J Periodontol* 2010; **81**:452-78.
8. Jeffcoat MK, McGuire M, Newman MG. Evidence-based periodontal treatment highlights from the 1996 world workshop in periodontics. *J Am Dent Assoc* 1997; **128**:713-24.
9. Pagliaro U, Nieri M, Franceschi D, Clauser C, Pini-Prato G. Evidence-based mucogingival therapy. Part 1: A critical review of the literature on root coverage procedures. *J Periodontol* 2003; **74**:709-40.
10. Pini Prato GP, Baldi C, Nieri M, Franseschi D, Cortellini P, Clauser C, *et al*. Coronally advanced flap: the post-surgical position of the gingival margin is an important factor for achieving complete root coverage. *J Periodontol* 2005; **76**:713-22.