

Pre- Prosthetic Periodontal Surgery To Enhance Patient's Esthetic Need: Case Series

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Abstract: Esthetics associated with health of periodontium in fixed prosthodontics is necessary, especially when treating the maxillary anterior region. An unfavorable relationship between gingiva and fixed partial denture commonly compromises the final result. The establishment of periodontal health is therefore prerequisite for successful and aesthetic prosthodontic and restorative procedure. The cases discussed here highlights a clinical situation where gingival recession is treated with mucogingival surgery and short crown height treated with crown lengthening followed by prosthesis to provide an optimum esthetics to the patient. After follow up there is no alteration in gingival margin present. Improvement of gingival condition and esthetic was achieved. Combine effort of surgical periodontal procedure and prosthetic approach give satisfactory treatment outcome for long period. [Vishnoi S Natl J Integr Res Med, 2019; 10(2):75-80]

Key Words: Periodontal plastic surgery, crown lengthening, Provisional restoration, Final Prosthesis

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Introduction: The connection between periodontal health and the restoration of teeth is indistinguishable. A sound periodontium provides a firm establishment for esthetic and functional prosthesis. For restorations to endure long term, the periodontium must remain healthy. For healthy periodontium, restorations must be critically managed in several areas so that they are in concordance with their surrounding periodontal tissues.

The gingival apparatus assumes an important job in the overall beauty of a person's smile. Esthetic periodontal plastic surgical procedure is turning into an inseparable part of dental treatment, as patients are becoming increasingly more conscious of dental esthetics. Because of which, it is critical for the clinicians to know about the distinctive choices, the dependability of these treatment modalities, the consistency of results and the long-term prognosis. More recently, treatments like clinical crown lengthening, covering denuded roots, alveolar ridge retention or augmentation, and implant site development are performed in anticipation of esthetic or implant dentistry.¹

Surgical crown-lengthening procedures are performed to provide retention form for allowing proper tooth preparation, impression procedures, and placement of restorative margins and to adjust gingival levels for esthetics.² It is important to preserve biologic width during crown lengthening surgery. Restorative clinicians must understand the role of biologic width (BW) in preserving healthy gingival tissues and controlling the gingival form around

restorations. The violation of BW is a contributing factor which jeopardizes periodontal health.³

Harmony and symmetry of gingival margin are important factors for planning of esthetic restorations. Disharmonious contour of the gingiva may give rise to an asymmetric appearance, which gives an unaesthetic smile. Correct orientation of the zenith and gingival height contour after treatment is important, as it helps avoid gingival level disharmony and aids in establishing correct tooth proportions.⁴ Recession is defined as 'the displacement of the marginal tissue apical to the cemento-enamel junction'. Gingival recession causes disharmony in gingival zenith which leads to unaesthetic smile. It is important to correct gingival recession for esthetic smile and restoration margin placement.

Case: 1 (surgical crown lengthening in patient undergoing full mouth rehabilitation) : A 45 year old female patient residing in Vadodara, reported to the Department of Prosthodontics for correction of spacing between upper and lower anterior teeth. So, full mouth rehabilitation was planned (Figure: 1). Patient was referred to the Department of Periodontics for crown lengthening procedure due to clinically short crowns. On clinical examination, clinically short crowns were present in relation to upper and lower, right and left, premolars and molars (figure: 2). All premolars and molars were then treated with root canal therapy. Surgical crown lengthening was planned in this patient to increase crown length and maintain the biological width.

Surgical procedure: Full mouth scaling was done. Two mm crown lengthening circumferentially was performed in all the premolars and molars. Local anesthesia was administered (2% lidocaine with 1:100,000 epinephrine). Thereafter, transgingival probing was conducted to determine the height and position of bone crest. Bleeding points were marked at 2 mm apical to gingival margin using pocket marker. The internal bevel incision is made on bleeding points. Then, the second or the crevicular incision is made from the bottom of the sulcus to the bone to detach the connective tissue from the bone. The full thickness mucoperiosteal flap is then raised and third incision is given to remove the tissue tags. The alveolar bone is reduced by ostectomy and osteoplasty, using micromotor and straight fissure, and round burs with copious saline

irrigation. Bone file was used to flatten interproximal bone. The final bone level was measured carefully in all locations around the tooth. Flap was stabilized using 4-0 silk suture. Post-operatively patient was prescribed analgesic (aceclofenac 100mg+paracetamol 325mg) twice daily for 3 days and antimicrobial (amoxicillin 500mg) thrice a day for 5 days. Patient was given oral hygiene instructions that included chlorhexidine mouth rinse for seven days, but was asked to restrain from brushing at the surgical site. One week later, sutures were removed. One month after the completion of crown lengthening in all 4 quadrants. (Figure: 3) the patient was referred back to the Department of Prosthodontics for prosthesis. Full mouth prosthesis was given to the patient.

Figure: 1 preoperative and postoperative pictures



Figure 2 : preoperative picture of clinically short crown



Figure 3 : 1 month postoperative picture after crown lengthening Increase width of attached gingival and root coverage



Case Series

A 42 year old male patient residing in Vadodara reported to the Department of Periodontics and Implantology with a chief complain of spacing and proclination of upper anterior teeth. On

clinical examination, spacing and proclination of maxillary central and lateral incisors was seen. Miller's grade II gingival recession was seen in maxillary right and left canine (figure: 4).

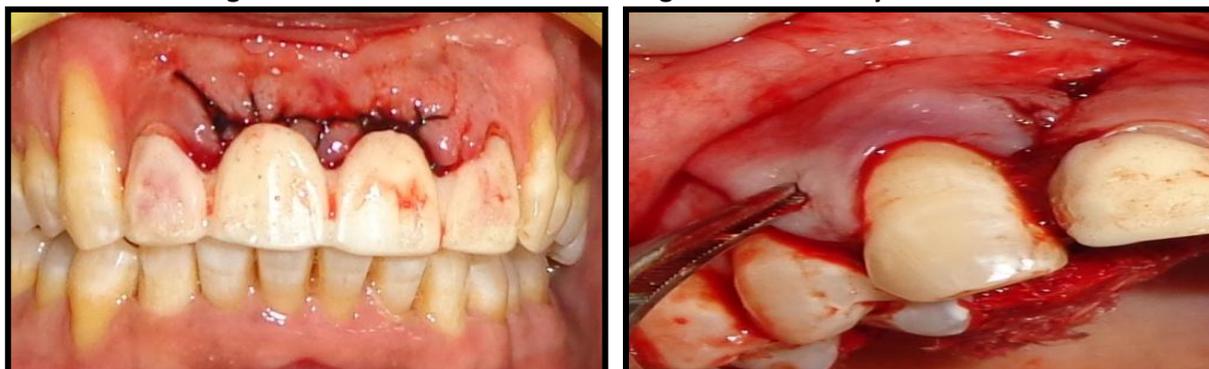
Figure 4:preoperative and postoperative pictures



Surgical procedure: Full mouth scaling and root planning was performed. Extraction of maxillary central incisors was carried out. Immediately

after extraction, provisional restoration was given to maintain gingival contour (figure: 5).

Figure 5: Provisional restoration was given immediately after extraction

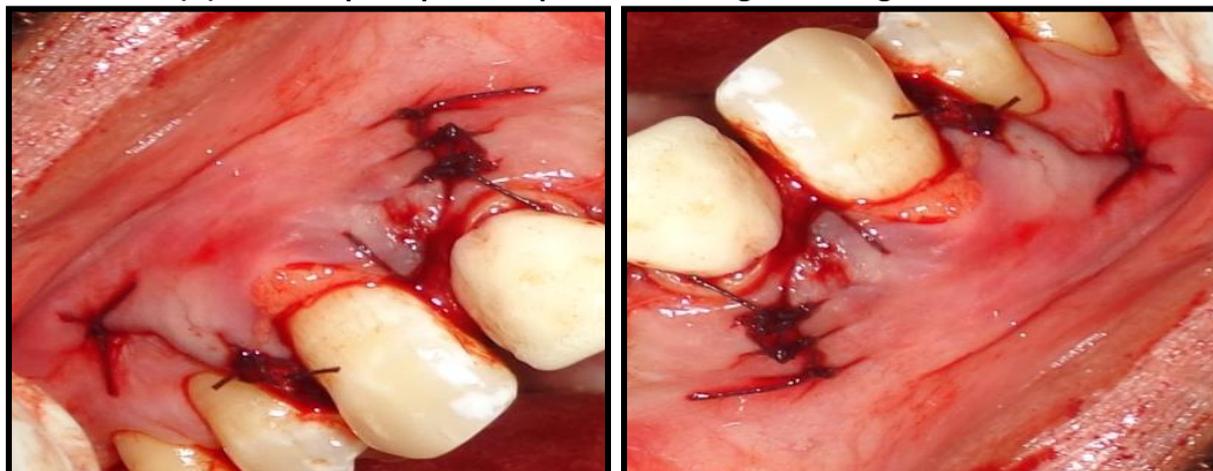


1 week after healing of the extraction site, mucogingival surgery (Connective Tissue Graft Technique) was performed. Local anesthesia was administered (2% lidocaine with 1: 100,000 epinephrine). Recipient Site I: 6 mm of gingival recession was seen in maxillary right canine (figure: 6A). The coronal margin of the flap is started with sulcular incision and two vertical incisions placed at least one-half to one tooth wider distance mesiodistally than the area of gingival recession and partial thickness flap was raised beyond the mucogingival junction(Figure: 6B). The interproximal papillae are left intact.

Figure 6 : (A) 6 mm gingival recession in relation to maxillary right canine. (B) Incisions were given and partial thickness flap was reflected



Figure 6 : (C) Harvested connective tissue graft from the palate was placed at recipient site and sutured. (D) 3 month postoperative picture showing 3 mm of gain in attached level.



Donor Site: A second surgical site is created on the palate. A horizontal incision is made approximately 5 to 6 mm from the gingival margins of the maxillary teeth of the desired width. It is continued apically as an inverse bevel towards alveolar bone. A second parallel horizontal incision is made 2 mm coronal to the first incision. It is continued apically until it meets the base of the original incision. The palatal bone is scored to enable the operator to remove the connective tissue wedge. Vertical incisions were made on either side of the horizontal incisions to further facilitate the removal of the connective tissue graft and aid in wound closure. The connective tissue and epithelium between the two horizontal incisions were excised and all adipose tissue was removed. 8×5 mm graft was harvested from palate. In addition, the band of epithelium which was taken with the donor connective tissue was allowed to remain on that portion which will be covering the denuded root. This seems to provide a smoother junction with the existing epithelium. Sutures were taken on palatal site.

Recipient Site II: Harvested connective tissue graft is placed over the denuded roots and stabilized using 4-0 silk suture. The partial thickness, recipient flap is positioned coronally in a manner to cover as much of the graft as possible and sutured in this position (Figure: 6C). No attempt is made to completely cover the graft as this would create an excessive pull on the vestibular fold. The recipient site is dressed with periodontal dressing. Post operatively, patient was prescribed analgesic (aceclofenac 100mg+paracetamol 325mg) twice daily for 3 days and antibiotic (amoxicillin 500mg) thrice a

day for 5 days. Patient was given oral hygiene instructions that included chlorhexidine mouth rinse for seven days, but was asked to refrain from brushing at the surgical site. The patient was recalled after 7 days to remove the periodontal dressing and sutures. Patient was recalled every month for follow up for first 3 months. After 3 months, partial root coverage was achieved (Figure: 6D). After that, final prosthesis was given to the patient.

Discussion: Crown lengthening treatment is based on two principles: establishment of BW and maintenance of adequate keratinized gingiva (KG) around the tooth. The BW is defined as the dimension of soft tissue that is attached to the portion of the tooth coronal to the alveolar bone crest. Studies show, that a minimum of 3 mm of space between restorative margins and alveolar bone would be adequate for periodontal health, allowing for 2 mm of BW space and 1 mm for sulcus depth. Whenever possible, an adequate width of KG (≥ 2 mm) should be maintained around a tooth for gingival health.⁵ Two different responses can be observed due to violation of BW. One possibility is that, the bone loss and gingival tissue recession occur as the body responds to recreate space between the alveolar bone and the margin for tissue reattachment. Tooth with thin alveolar plate and thin gingival biotype are more prone to bone loss and gingival recession. Trauma from the margin of the restoration can play a major role in fragile tissue recession. The other possibility is, the development of persistent gingival inflammation.⁶ In our case 1 mm of sulcus depth and 2 mm of biological width was present. Hence, we had decided to go for 2mm of gingivectomy

and 2mm of bone reduction to achieve 2mm crown lengthening.

The importance of a zone of attached gingiva for maintaining periodontal health is controversial; however, its importance for esthetics and in selected clinical situations has been reported⁷. It has been suggested that 5 mm of keratinized tissue is desirable to prevent recession in areas in which a restoration with subgingival margins is planned⁸. The two procedures most frequently used to increase the width of keratinized tissue are: free gingival graft and connective tissue graft. Both techniques are of similar predictability but, connective tissue grafts have better esthetic results⁹. One important factor to note is that connective tissue grafts have a higher shrinkage rate in comparison with free gingival grafts¹⁰. Provisional restorations are used to maintain gingival health by preserving the position, contour and color of the gingiva while the definitive restoration is constructed¹¹. To achieve these goals, the gingiva should rest on a properly contoured, smooth and well-fitting provisional restorations¹². Several authors agree that this can be more reliably completed when the provisional restorations are fabricated in a dental laboratory. Indirect techniques can deliver an ideally contoured provisional, which is the key to achieving good esthetics and proper access for oral hygiene¹³. Poor provisionals are often linked to periodontal inflammation and gingival recession¹⁴. In our case, 6 mm of gingival recession and only 2 mm of attached gingiva was present leading to unaesthetic appearance and difficulty in restoration margin placement. Result of connective tissue graft technique showed 3 mm of attachment gain. Due to provisional restoration, nice gingival contour was achieved and final restoration was provided to the patient 3 months after the surgery. Ideally, orthodontic treatment has to be done in this patient for proclination and spacing in between maxillary central and lateral incisor but, patient was not willing for the orthodontic treatment. So, restorative treatment was carried out. Patient was satisfied with the treatment given.

Conclusion: Healthy periodontal tissues provide solid foundations for predictable prosthetic therapy. Moreover, recovering stable periodontal conditions ought to depend on foundation of appropriate contact types, occlusal plane and quality prosthesis. Frequent and efficient communications are essential between

periodontist and prosthodontist during entire treatment procedures, including planning, treatment procedures and maintenance. This is because, both specialties share a common goal: to create pleasing esthetic with a harmonious stomatognathic system.

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