



A Roll Flap Technique to Enhance Restorative and Soft Tissue Esthetics for Tooth Replacement in Anterior Maxilla : A Case Report

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ABSTRACT

Hard and soft tissue alveolar ridge deformities occur following the extraction of teeth, creating functional and esthetic tooth replacement challenges, especially in the maxillary anterior smile zone. A surgical technique using a rotated palatal flap for ridge preservation is discussed that, whether combined with conventional

fixed dentures or implant treatment for tooth replacement, provides the possibility for greatly improved esthetics. In addition, preservation and augmentation at the extraction site provide soft tissue contours adjacent to the definitive restoration that vary little from those of the original natural tooth. Combined with conventional fixed dentures, use of this technique creates a template of the labial and interproximal sulcus of the extracted tooth, allowing for the molding of an ovate pontic replacement tooth. This results in vastly improved restorative emergence profiles with minimal or no change in the height of the labial gingival margin and the form and height of the interproximal papillae with adjacent teeth.

KEYWORDS : Roll flap technique, Ovate pontic, Ridge augmentation, Inflammation, Healing.

INTRODUCTION

In the adult patient, tooth loss in the maxillary anterior zone can occur secondary to facial trauma, failing root canal therapy, root fracture, tooth internal or external resorption, or decay. In the normal process of healing and repair following tooth extraction, the maxillary alveolar ridge adjacent to the involved tooth will resorb, leaving a deformity in the shape and form of both the hard and soft tissues.^{1,2}

Alveolar ridge width decreases by 50% in the first year after a tooth is extracted.³ As extraction sites heal, the largest change occurs on the labial and coronal aspects of the alveolar ridge, bringing with it a loss in both horizontal and vertical ridge dimensions. Any change in the alveolar hard and soft tissue ridge profile is undesirable⁴.

Some authors have reported that the minimal horizontal change in the gingival marginal height that will occur on the labial aspect of an extraction site is 2 mm.^{5,6} In addition, the interdental papillae will be altered and reduced in height, impacting the periodontal soft tissue esthetic profile for the replacement tooth in the definitive fixed prosthesis.⁷

According to Siebert (1983) ridge defects can be divided into three classes:

- Class I : Loss of bucco-lingual width but normal apico-coronal height.
- Class II: Loss of apico-coronal height but normal bucco-lingual width.
- Class III : A combination of loss of both height and width of the ridge.

The labial soft tissue profile at the crest of the ridge of the extracted tooth is the template for preserving the soft tissue relationships of the marginal gingiva and soft tissue that define the tooth emergence profile. If the esthetics of the labial soft tissue is to be undisturbed, the palatal gingival tissue must be the source of the soft tissue augmentation. Several authors have described a rotated palatal flap that can be mobilized and positioned over an extraction site so as to provide these essential surgical anesthetic requirements.^{8,9}

CASE REPORT

A 42 year old man had come to Bharati Vidyapeeth Dental College And Hospital, Pune with the chief complaint of replacement of missing upper front tooth. Patient presented a history of extraction of the upper right central incisor 3 years back. He had a Class II Siebert ridge defect and was given a treatment option of fixed partial denture for the missing tooth. A ridge augmentation procedure was advised prior to prosthetic replacement. Roll-flap technique was considered for the treatment.

The "roll-flap" procedure¹⁰

Surgical concept

This procedure is used in the treatment of small to moderate class I or class II ridge defects. The technique enables the surgeon to augment tissue apically and labially to the cervical area of a pontic and to give the recipient site the appearance of a normal tooth-gingiva interface. Hence a bucco-lingual ridge concavity can be converted into a ridge convexity resembling the eminence produced by the roots of the adjacent teeth.

Surgical technique

A rectangular pedicle of connective tissue is prepared on the palatal side of the defect. The length of the pedicle was matched with the amount of apico-coronal augmentation required. This in turn is related to the amount of root eminence that exists on either side of the defect. The epithelium on the palatal surface of the donor site was first removed. A maximum amount of supra-periosteal connective tissue was raised from the palate using sharp dissection. The void that is produced at the donor site will gradually fill in with granulation tissue. A pouch was made in the supra-periosteal connective tissue at the facial surface of the ridge. The pedicle was tucked into the pouch as a try-in procedure. Adjustment of pedicle size was made. Once the pedicle was fitting as desired, it was made ready for the stabilizing suture. Sutures were placed at the muco-gingival junction to catch the tip of the pedicle flap and pull it into place in the pouch. The sutures must be positioned close to the muco-buccal fold. This enables the surgeon to pull the pedicle to the apical portion of the pouch. The suture should not be tied tightly since it only serves as a positioning and stabilizing device.

Pontic preparation

An ovate pontic was made ready prior to the surgery. The shape of the teeth in the provisional restoration, emergence profile of the teeth and embrasure form was kept as an exact prototype of the final prosthesis that is to be constructed. A light contact was maintained between the pedicle graft and the tissue surface of the pontic.

The post-operative swelling will cause the tissue to conform to the shape of the pontic. This will enable the soft tissue into a form that is intended for the augmented site.

Post-operative care

A periodontal dressing was placed over the donor site. No dressing was placed over the facial surface of the grafted area where swelling will occur. Patient was recalled after 7 days.

RESULTS

7 days post-operative findings revealed that the soft tissue at the surgically treated recipient site had undergone considerable swelling during the early phase of the healing around the pontic.

1 month post-operative results revealed that the tissue at the surgically treated recipient site had conformed to the tissue facing surface of the ovate pontic. Thus, prosthesis was used to help in reshaping the outline of the augmented ridge to the desired form. Now, patient was advised to go for the final restoration.

CONCLUSION

The use of a rotated palatal flap ridge preservation procedure provides significant functional and esthetic advantages as healing and repair occur at the extraction site. In instances where this procedure is combined with conventional fixed partial denture treatment, the preservation of the crestal ridge architecture allows for improved esthetics in the treatment outcome. If implant treatment is completed at a site where a rotated palatal flap was used for ridge preservation, the benefit to the underlying bony ridge architecture can be readily seen. Retention of the labial-lingual ridge width and occlusal-apical ridge height allows for improved implant positioning at surgery and improved esthetics with the definitive implant restoration.





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