

## Pre-prosthetic Soft Tissue Ridge Augmentation Using Modified Roll Technique - A Case Report

### Abstract

The defects of the alveolar ridge can result from various causes, most common being the collapse of alveolar bone during extraction. Localized defects of alveolar crest impair prosthetic rehabilitation due to poor emergence profile of the pontic which in turn adversely affects the aesthetics and function. Several alternatives have been proposed to restore the damaged ridge by hard and soft tissue augmentation. Various soft tissue ridge augmentation techniques have been used to augment alveolar ridge with varying success. The present clinical report describes the modified roll technique as a means of soft tissue ridge augmentation to treat alveolar ridge defects.

### Key Words

Alveolar Ridge Defect, Modified Roll Technique, Ridge Augmentation

### Introduction

A normal ridge is defined as one that retains the general shape of the alveolar process following uneventful extraction socket healing. Localized defects in alveolar ridge are often found in partially edentulous patients. A deformed ridge may result from tooth extractions, advanced periodontal disease, abscess formations, periapical pathologies, developmental disorders, external trauma and tumors.<sup>[1]</sup>

Seibert (1983) classified these defects into three different categories<sup>[2]</sup>:

Class 1 defect : bucco lingual loss of tissue with normal height in apicocoronal dimension.

Class 2 defect : apicocoronal loss of tissue with normal ridge width in buccolingual dimension.

Class 3 defect : combination buccolingual and apicocoronal loss of tissue resulting in loss of normal height and width.

Various techniques have been employed to correct these tissue deformities like guided bone regeneration, bone grafts, bone substitutes, and soft tissue ridge augmentation. The latter includes the epithelial connective tissue graft (Meltzer, 1979)<sup>[3]</sup>, onlay grafts (Sibert, 1983)<sup>[2]</sup>, subepithelial connective tissue graft (Langer and Calanga, 1980)<sup>[4]</sup>, and roll pedicled graft technique (Abrams, 1980; Scharf and Tarnow, 1992; Barone et al, 1999; Gasparini, 2004)<sup>[5],[6],[7]</sup>.

Over the years, new techniques are constantly being developed to treat

alveolar ridge defects. The choice of techniques should be based on predictability of the outcome and may vary from case to case. Taking into account the advantages of roll flap procedure, the article describes the modified roll technique to treat the alveolar ridge defects.

### Case Description

A 42 year old female patient presented with Seibert class I deformity in the edentulous ridge following extraction of maxillary right first and second.

pre-molar several years back. Prior to fabrication of definitive prosthesis, it was decided to augment the defect by 'trap door technique'.

Prior to surgery, patient was instructed to rinse with 0.2% chlorhexidine gluconate solution for 30 seconds. The area was anesthetized by nerve block and infiltration anesthesia using local anesthetic solution, 2% lignocaine with 1:1,00,000 epinephrine.

The technique involves reflection of partial thickness flap towards the palatal mucosa. Two full thickness vertical incisions are made from the crest of the ridge towards the palate. The length of the incision depends on the length of connective tissue graft desired. The incisions were placed 2mm away from the sulci of adjacent teeth to preserve the papilla. Another partial thickness incision was given on the crest of the ridge to join the two vertical incisions. The rectangular partial

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thickness pedicle flap was reflected by sharp dissection up to the apical extent of the connective tissue pedicle in such a way that the entire thickness of epithelium and a thin layer of connective tissue was incorporated in the flap. A second horizontal incision was made along the apical extent of the connective tissue pedicle. The connective tissue pedicle is then reflected towards the buccal aspect to expose the alveolar bone of the palate. Once the connective tissue was reflected to the crest of the ridge, a pouch was created between the buccal mucosa and the alveolar bone. The connective tissue was then rolled in a pouch created between the facial mucosa and the alveolar ridge and secured with sutures. The epithelial pedicle was repositioned over the denuded palatal donor site and secured with sutures.

Postoperatively patient was prescribed antibiotics (amoxicillin 500 mg t.i.d. for 5 days), and analgesic (diclofenac sodium t.i.d. for three days). Patient was advised to rinse with 0.2% chlorhexidine gluconate mouthwash twice daily for two weeks. Healing was uneventful and the sutures were removed after ten days.

### Discussion

The ridge defects create a functional and aesthetic challenge to maintain normal



Figure 1 – Pre-operative Image Of The Defect.

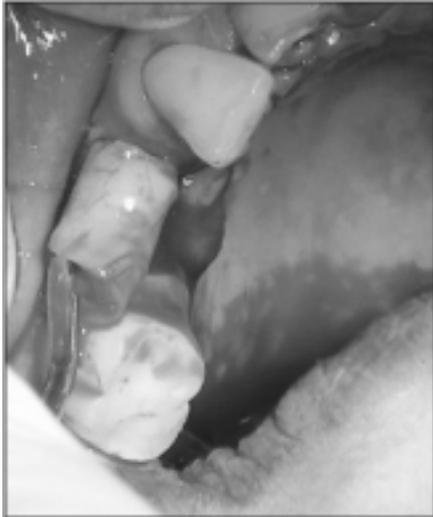


Figure 2 - Reflection Of Flap By Modified Roll Technique.



Figure 3 – Rolled Flap Stabilized With The Sutures.



Figure 4 – Six Month Post-operative Image With Definitive Prosthesis.

anatomy of the oral tissues. The standard restorative treatment procedures cannot be carried out because the tooth-to-gingival relationship is not maintained, resulting in an unattractive prosthesis.

Localized alveolar ridge defects may be corrected by two different approaches:

hard tissue ridge augmentation and soft tissue augmentation procedures. However, when planning fixed partial denture as definitive prosthesis, soft tissue augmentation procedures alone provide a satisfactory aesthetic outcome in the majority of cases.

Various surgical approaches have been proposed to augment ridge defects using soft tissue and have been widely accepted.<sup>[1],[2],[3],[4]</sup> The roll flap procedure, originally proposed by Abrams<sup>[5]</sup> in 1980, although widely accepted, has been constantly modified by several authors to overcome the limitations such as chances of flap necrosis, need for a second surgical site and pain due to healing by secondary intention.

The free gingival graft<sup>[3]</sup> and subepithelial connective tissue graft techniques<sup>[8]</sup>, although established procedures, have certain disadvantages. In free gingival graft and subepithelial connective tissue graft, original vascularization is not maintained, which predisposes it to necrosis and shrinkage of the graft. Moreover, there are chances of haemorrhage at the donor site and postoperative pain and discomfort related to the second surgical site. In addition, free gingival graft also poses problems of colour match and therefore cannot be used in aesthetic areas.<sup>[9]</sup> This case report explains the treatment of a Seibert class I alveolar ridge defect involving two teeth with a satisfactory result. The technique explained in this paper is a modification of Abrams' roll technique. The 'trap-door' technique described here provides better visibility and accessibility of the surgical site. Unlike the original roll flap procedure, this technique provides primary closure of the denuded bone. Healing of the donor site by primary intention is the main advantage of this technique, thereby minimizing the risk of infection, scar formation and morbidity associated with the second surgical site<sup>[6]</sup>. Moreover, some authors suggest that the amount of connective tissue that may be rolled under the buccal flap is increased.

However, the limitation of this technique is the higher number of incisions, which can result in compromised vascularity. Moreover, a higher number of incisions usually require a higher number of sutures.

### Conclusion

The replacement of missing teeth is only

a part of the treatment. Another important aspect of therapy consists of replacing the lost portion of the alveolar process and the associated soft tissue. The re-establishment of a normal alveolar contour is a critical step in aesthetic success. The procedure described in this case report showed satisfactory results in an aesthetic region with a single surgical procedure that overcomes the limitations of the other soft tissue graft techniques along with better healing and stability of the graft post-operatively.

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