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Connective Tissue Rolled Pedicle Graft With Hydroxyapatite Bone Graft for Ridge Augmentation-A Case Report

KEYWORDS: Ridge augmentations, bone graft, roll technique

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ABSTRACT *A number of causes like post extraction, trauma, or presence of cysts may lead to alveolar defects. Rehabilitation would be impaired which may affect esthetics due to the presence of localized alveolar defects leading to poor emergence profile. Overcoming such ridge defects require hard and soft tissue augmentation procedures that would restore the alveolar defects. Numerous hard and soft tissue augmentation procedures have been proposed to correct these alveolar ridge defects. The present case report describes the modified roll technique which is an attempt to treat one such alveolar defect.*

Introduction:
Dimensionally the alveolar bone changes after extraction. Most of the resorption occurs in the first three months causing soft tissue recession leading to an unesthetic appearance. Replacement of a missing maxillary anterior tooth with a residual defect is highly challenging and esthetically demanding. Loss of labial residual ridge may lead to unaesthetic open gingival embrasures and its loss after tooth loss is inevitable[1]. It is characterized by deficient volume of bone (hard tissue) and gingival tissue (soft tissue). [2].

Seibert classified alveolar defects as follows [3]:

1. Class-I: Buccolingual loss of tissue contour with normal apicocoronal height
2. Class-II: apicocoronal loss of tissue with normal buccolingual contour
3. Class-III: Combination of both buccolingual and apicocoronal loss (loss of both height and width)

Allen modified this classification and included the quantification of the severity of the defect to the adjacent alveolar bone level [4].

1. Mild: depth less than 3 mm
2. Moderate: from 3-6 mm
3. Severe: more than 6 mm

To correct these alveolar defects, various hard and soft tissue augmentation procedures were proposed. Hard tissue augmentation procedures include autogenous bone grafts, and guided bone regeneration. Soft tissue augmentation procedures include free gingival graft, connective tissue graft, roll pedicle grafts, modified roll pedicle grafts [5].

Abrams proposed the roll pedicle graft technique [6]. It includes de-epithelization of a palatal pedicle flap and exposure of palatal bone. This pedicle is then rolled under the buccal mucosa to increase the buccolingual dimension of the edentulous ridge for later fabrication of a fixed prosthesis. The flap is released by two vertical incisions extended beyond the mucogingival junction. But the disadvantage of this technique is that the palatal bone will be exposed and hence the technique is modified. Modified roll technique using a "trap-door" approach was proposed by Scharf DR, Tarnow DP[7] (1992), to cover the palatal bone in which the epithelium over the palatal connective tissue is raised and preserved to cover the palatal bone. Barone et al[8] (1999) further modified this roll technique with intrasulcular incisions forming a full thickness "envelope" on the buccal aspect instead of the two buccal releasing incisions.

Here, we are discussing about a case report describing modified rolled palatal pedicle connective tissue graft with bone graft to correct the maxillary alveolar defect.

Case report:
A female patient, aged 23 years was referred to Department of Periodontology from Department of Prosthodontics, Manipal college of Dental Sciences for opinion regarding the edentulous site. Patient gave a history of trauma 2 years back due to which she lost her upper front teeth.

On clinical examination, the edentulous site with respect to maxillary right central incisor had showed reduced horizontal and vertical alveolar bone height. Prior to fabrication of a definitive prosthesis, it was decided to augment the defect by roll technique. The treatment plan was explained to the patient and an informed consent was obtained from the patient.

Procedure:
The surgical procedure was carried out under aseptic conditions. Pre-opreative measurements facio-palatally and vertically of the edentulous site was measured using a slide caliper as well as a Williams periodontal probe (table-1).The ridge defect falls under Seibert's classIII and moderate according to Allen. After administration of local anaesthesia, a submarginal horizontal incision was made 2mm palatal to the edentulous space and continued with the two vertical releasing incisions on the buccal aspect adjacent to the alveolar defect. Mucosal flap was reflected and a pouch was created at the base of the flap in the vestibular area on the buccal aspect. Now again, from the same site a periosteal flap is elevated leaving the underlying bone exposed. The underlying buccal and crestal bone is decorticated with a no.1 round bur and packed with hydroxyapatite bone graft. Now the periosteal flap

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is rolled and packed into the pouch created before such that it rests on the alveolar crest, covering the grafted site and sutured. Then the mucosal flap is sutured over the periosteal flap using horizontal matress sutures using silk suture. Periodontal dressing is given. Patient is given post-operative instructions.

Patient was prescribed Amoxicillin 500mg to be taken thrice daily for 5days and Tab Lyser-D to be taken three times daily for 2days. The patient was instructed to use chlorhexidine mouth wash twice daily for 2weeks.

Suture removal was done after 2 weeks. Patient was followed up at 14 days and after one month. One month post-operative evaluation revealed an increase in the vertical height of soft tissue as well as an increase in the facio-palatal dimension (Table-1). Patient was referred for prosthetic rehabilitation and modified ridge lap pontic was given.

	Preoperative	Post-operative	Post-operative gain
Vertical height (mm)	3	5	2
Facio-palatal Dimension(mm)	5	8	3

Discussion:

The present case was done to correct the maxillary alveolar ridge defect by the modified roll technique with hydroxyapatite bone graft. The roll technique was proposed by Abram (1980). But the disadvantage of roll technique is palatal bone will be exposed. Hence the modified roll technique was proposed by Scharf and Tarnow[7] (1992) to overcome the disadvantage of roll technique.

The other soft tissue augmentation procedures like free gingival and sub epithelial connective tissue grafts, although are established procedures, pose some disadvantages like second surgical site, patient morbidity, color match not present especially when free gingival graft was used, and original vascularization not maintained[6]. To overcome these disadvantages the present case was done by modified roll technique.

The case report explains the advantages of roll technique like good color match, only one surgical site is involved. The disadvantage is it cannot be used to treat larger defects as there is lack of more tissue availability.

Conclusion:

It is said that the replacement of missing tooth is only a part of the treatment. The underlying alveolar contour and soft tissue play a major role in replacing a tooth with alveolar defect. Soft tissue especially in the anterior region plays a role in esthetic considerations. So the present technique can be employed to treat Seibert's Class-III alveolar defects.

Legends:

Vertical and horizontal loss
Informed consent form
Split thickness flap elevation and Pouch
Pre-operative view
Rolled connective tissue
Packed with TATA bone graft
Suture placement
Periodontal pack given
Suture removal after 10days
Palatal tissue healing by primary intention
Prosthesis delivery

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