

**Soft Tissue Ridge Augmentation in Maxillary Anterior Region by using Double Fold Palatal Connective Tissue Pedicle Graft- A Case Report**

<sup>1</sup>Dr. Vikas Deo, Associate Prof and Head, Dept of Dentistry, Dr S. N. Medical College, Jodhpur

<sup>2</sup>Dr Ramesh Chavan, Consultant Dental Surgeon, Saudi Arabia

<sup>3</sup>Dr C.S. Chattopadhyay, Associate Prof , Dept of Dentistry, Dr S. N. Medical College, Jodhpur

<sup>4</sup>Dr Dinesh Pilania, Senior Resident, Dept of Dentistry, Dr S. N. Medical College, Jodhpur

**Corresponding Author:** Dr Dinesh Pilania, Senior Resident, Dept of Dentistry, Dr S. N. Medical College, Jodhpur

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**Conflicts of Interest:** Nil

**Abstract**

The evolution of periodontal plastic surgical techniques allowed the clinician to meet growing expectations and demands of today’s dental patient. Long term growth and development of clinical research has provided a means of treating problems of inadequate alveolar ridges necessary for restorative procedures. Newer techniques are evolving in restorative dentistry and periodontology to treat these defects to improve the esthetics, form and functions of the dentition. In this case report, Class III ridge defect in anterior dentition was treated by using double fold palatal connective tissue pedicle graft technique with promising and encouraging results.

**Keywords:** Ridge Augmentation, Pedicle Connective Tissue Graft, Esthetics

**Introduction**

A localized alveolar defects are frequently found in partially edentulous patients that impairs the prosthetic

restoration of damaged ridge area causing esthetic, phonetic, and oral hygiene complications. These defects are associated with the deficit in volume of bone and soft tissues within the alveolar process resulting from traumatic tooth extractions, advanced periodontal disease or periapical pathologies, developmental defects, external trauma, and tumors. Siebert (1983) [1] identified three basic ridge deformities- Bucco-lingual loss of tissue (class I), Apico-coronal loss of tissue (class II) and combination of Bucco-lingual Apico-coronal loss of tissue (class III).

Over the last decade, advancements and modifications in technologies in the field of restorative dentistry and periodontics have been able to achieve best results to restore form, function and esthetics of the patient. Reconstructive procedures for the deformed alveolar ridge have evolved guided bone regeneration [2,3] bone graft and soft tissue graft beneath the flap or in tunnel made in

the damaged ridge area [4,5]. Soft tissue graft employed for ridge augmentation include use of free gingival or onlay graft, using the palate as a donor area, as proposed by Seibert and subepithelial connective tissue graft implanted in a tunnel or pouch prepared in the mucosa that lines the defect. However, each procedure presents certain limitations.

New techniques are constantly being developed to treat alveolar ridge defects. Gasparini (2004) [6] proposed a surgical procedure to treat localized alveolar ridge defects in posterior segment by using “double-fold connective tissue pedicle graft”. Therefore, the purpose of this case report was to clinically evaluate the effectiveness of double-fold connective tissue pedicle graft to augment localized alveolar ridge defect in anterior dentition.

### **Case report**

A 35-year old man presented with localized alveolar ridge deformity in maxillary anterior region as a result of the extraction of the right central incisor due to trauma 1 year earlier. A clinical examination of the maxillary alveolar ridge revealed a Seibert Class III defect (combined apico-coronal, fig 1, and bucco-lingual, fig 2, loss of tissue height). A localized ridge augmentation was necessary to obtain esthetic prosthetic reconstruction and then it was decided to augment the ridge with double fold connective tissue pedicle graft. A provisional restoration was made prior to the surgery. The shape of the teeth, an axial inclination, emergence profile of the teeth and the embrasure form for provisional restoration were exact prototype of the final prosthesis was constructed. The provisional prosthesis was used to help in shaping the outline of the augmented ridge to the desired form during healing. Informed consent was obtained from the patient.

### **Surgical procedure**

Immediately prior to the surgical procedure the patient was instructed to rinse for 30 seconds with 0.2%

chlorhexidine gluconate solution. The area subjected to surgery was anaesthetized by nerve block and infiltration anaesthesia using local anaesthetic solution 2% Xylocaine with 1:1,00,000 epinephrine. The technique involved reflection of a thin epithelial connective tissue flap toward the palate for exposing underlying connective tissue (fig 3). A full-thickness vertical incision was made from the mesial aspect of the crest of the deformed ridge toward the palatal aspect. The length of the incision was depending on the length of connective tissue graft desired. The palatal incision met a partial-thickness horizontal incision made on the crest of the edentulous ridge. An intra-crevicular incision palatal to the right lateral incisor and canine was made while preserving the central papilla. The reflection of a thin epithelial connective tissue flap was initiated at the crest of an edentulous ridge to expose the underlying connective tissue. The desired graft was then outlined by the first vertical incision made along the mesial extent and full-thickness incisions were made along the mesial and distal extent of defect extending in such a way that the mesiodistal size of graft exceeds almost double the mesio-distal size of the ridge defect. Then, the connective tissue graft was reflected by blunt dissection with a back-action periosteal elevator (fig 4). The reflection of palatal connective tissue graft was initiated at the apical or medial end, reflecting further coronally to reach the crest of the ridge defect. From the ridge crest, sharp dissection was performed near the periosteum to create a pouch (fig 5) between the alveolar mucosa and underlying bone on medial surface. The distal half of the connective tissue graft was then folded below the mesial half, giving rise to the first fold. With the help of a resorbable suture from the labial surface, the whole graft was rolled into the labial pouch, giving rise to the second fold. The graft was secured with the same suture (fig 6). The palatal epithelial-connective tissue flap was

replaced on the denuded bone and secured with non-resorbable sutures (fig 7).

After surgery, a non-steroidal anti-inflammatory (Tab Ibugesic-Ibuprofen+Paracetamol, tds for 5 days) and antibiotic coverage consisting of Amoxicillin 500 mg tds was prescribed for 5 days. Patient instructed not to brush the teeth in the treated area and placed on 0.2% chlorhexidine gluconate mouthwash (Hexidine-ICPA) twice daily, for one minute, for 4-6 weeks. The sutures were removed 10 days after the periodontal surgery, and the patient presented with a satisfactorily soft tissue healing (fig 8).

### **Results**

During the course of the study, wound healing was uneventful. There were no post-operative complications and patient was satisfied with the results. The increase in the amount of tissue present was adequate to permit placing an esthetic fixed restoration. Initially shrinkage of soft tissue graft occurred but appeared stable thereafter.

Three months post-surgically, there was 4mm gain in bucco-lingual width with 1.5mm gain in apico-coronal height. Augmentation resulted in 100% restoration of deficient ridge, with satisfactory improvement in bucco-lingual and apico-coronal direction (fig 9). The construction of fixed restoration was delayed for 2 months. The final esthetics after placement of fixed restoration was acceptable to the patient with superior esthetic results.

### **Discussion**

The case presented refers to the treatment of a Class III alveolar crest defect that involved the area of only one tooth, with satisfactory result. Several therapeutic alternatives have been proposed to correct this type of ridge defects. The previous techniques for ridge augmentation proposed by Abrams [7] and Scharf and Tarnow [8] used for the treatment of small to moderate

Class I defects. These techniques pose difficulty in obtaining required volume because of limited thickness and size of the graft. At the same time, the techniques that involve large graft, such as full-thickness onlay grafts are more prone to cause necrosis [5]. In all these techniques, the mesio-distal dimension of the graft matches the mesiodistal dimension of the defect at the time of surgery; however, soft tissue graft undergoes shrinkage. Therefore, multiple surgical procedures may be required to achieve predictable results [9,10]. The technique described in this case report was proposed by Gaspirani [6] and allows the graft to be folded before it is placed under the vestibular flap, favoring the gain in tissue volume. Since, the blood supply to the graft is guaranteed; the risk of necrosis is very low. Furthermore, clinically good color match was presented to the adjacent tissues, with less patient discomfort because of a single surgical site.

### **Conclusion**

In this case report, ridge augmentation by using double fold palatal connective tissue pedicle graft showed satisfactory results in an esthetic region with a single surgical procedure that overcomes the limitations of the other soft tissue graft techniques. As the thickness of connective tissue graft is limited in anterior palatal region, this technique is predictable for Class I, Class II and Class III defects. Clinical studies using large sample size with long-term analysis are necessary to determine the success rate and predictability of this surgical technique.

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### Legends Figure



Figure 1



Figure 2



Figure 3

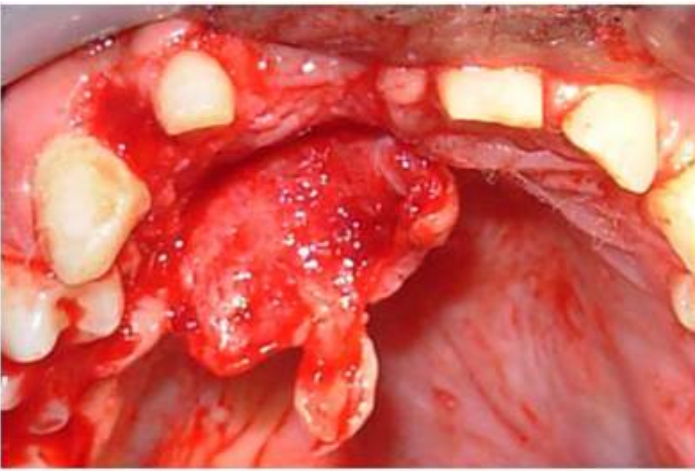


Figure 4



Figure 7

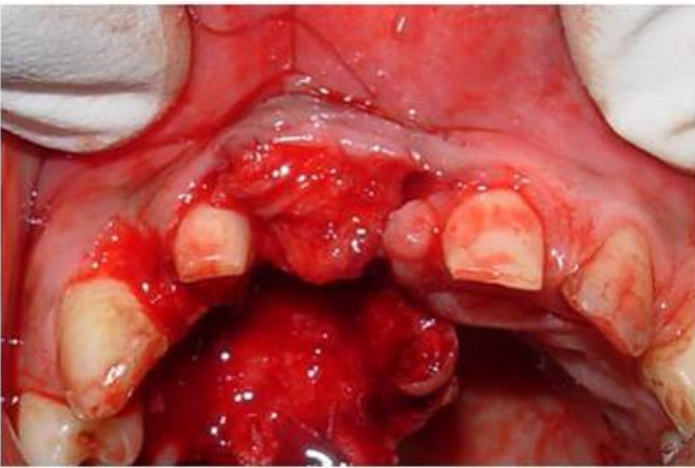


Figure 5



Figure 8

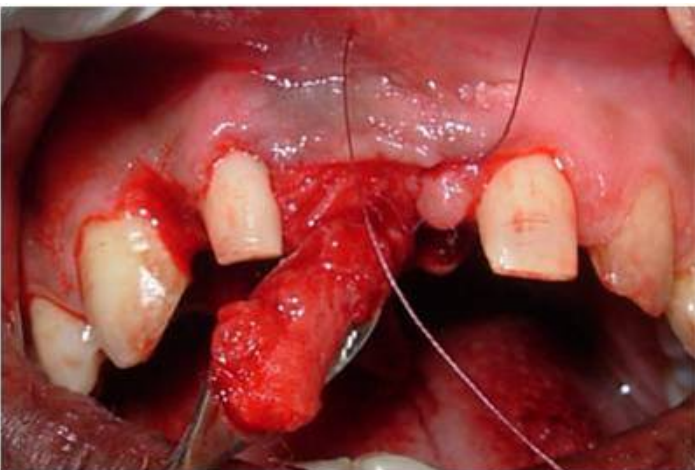


Figure 6



Figure 9