

**Case report:**

## **Interdisciplinary approach-localized alveolar ridge augmentation : a case report**

<sup>1</sup>Dr.Kirti Dulani ,<sup>2</sup> Dr.Neeta.V.Bhavsar, <sup>3</sup>Dr.Shraddha Shah

<sup>1</sup> Tutor, Department Of Periodontia, Govt. Dental College & Hospital, Ahmedabad ,Gujarat

<sup>2</sup> Professor &Head, Department Of Periodontia,Govt. Dental College& Hospital, Ahmedabad ,Gujarat

<sup>3</sup> Tutor, Department Of Periodontia,Govt. Dental College & Hospital, Ahmedabad ,Gujarat

Corresponding Author: Dr.KirtiDulani ; E-Mail: Dr.Kirtidulani@Gmail.Com

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**Abstract:**

Interdisciplinary dental rehabilitation should be contemplated as a long-term solution for the esthetic and functional dental rehabilitation of patients. To obtain longevity of treatment, the therapeutic decisions must be based on the biologic health of the periodontal foundation and must respect the functional occlusion and dental alveolar anatomy. This report utilizes case examples to demonstrate the principles of planning and delivering interdisciplinary periodontal and prosthodontic treatment. Recognition of esthetic mucogingival problems and a plan for their correction are the prerequisites for esthetic success in prosthodontic rehabilitation. Reconstruction of alveolar ridge deficiency for cosmetic, functional, and cleansibility requirements is a major challenge for reconstructive Periodontist. No single procedure is well suited to overcome this kind of problem. The objective of this article is to update the knowledge associated with various soft tissue augmentation procedures and techniques

Keywords : Interdisciplinary dental rehabilitation

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**Introduction:**

Prosthetic treatment of a localized alveolar ridge defect is an important mucogingival- esthetic challenge. Localized alveolar ridge defects typically are restored with single- or multiple- tooth fixed partial dentures. Prosthetic treatment of a surgically uncorrected localized alveolar ridge defect with a fixed restoration is associated with several esthetic and functional problems<sup>1</sup>.

Esthetic problems:

1. Loss of papillae; formation of “black”, open interdental spaces.
2. .Loss of buccal contour; more difficult design of an esthetic pontic rest.
3. Un-aesthetic gingival texture (scar tissue) or missing gingival breadth.

Functional problems:

1. .Danger of phonetic problems; “moist” speaking voice (open interdental spaces).
2. Danger of food impaction.

From a morphologic standpoint, Seibert<sup>2</sup> classified ridge deformities into three types according to the vertical and horizontal defect components:

1. Class I defect: Buccolingual loss of tissue contour with a normal apicocoronal height.
2. Class II defect: Apicocoronal loss of tissue with normal buccolingual contour.
3. Class III defect: A combination of buccolingual and apicocoronal loss.

Later, Allen et al.<sup>3</sup> introduced severity as a classification criterion in the evaluation of alveolar deformities. Severity is classified as-

1. Mild deformity < 3mm
2. Moderate deformity 3 - 6mm
3. Severe deformity > 6mm

Ridge augmentation is a valuable periodontal plastic surgery procedure for correction of ridge defects for aesthetic and functional purposes. Surgical correction procedures of the localized alveolar ridge defect may be grouped according to the means used for ridge augmentation as:

1. Soft tissue augmentation procedures.
2. Hard tissue augmentation procedures.

#### **Soft tissue augmentation:**

The various approaches utilization of soft tissues for ridge augmentation can be classified as:

1. Pedicle graft procedure:
  - a. Roll flap procedure<sup>4</sup>
2. Free graft procedures:
  - a. Pouch graft procedure<sup>5</sup>
  - b. Onlay graft procedure<sup>6</sup>
  - c. Interpositional graft procedure<sup>7</sup>
  - d. Combined onlayinterpositional graft procedure<sup>8</sup>

In this case report we augmented an alveolar ridge by the pouch technique using subepithelial connective tissue graft combined with bone graft.

#### **Case Report:**

A 45 Years female patient reported in the Department of Periodontia, Government dental College and Hospital Ahmedabad, with complain of un-aesthetic tooth site. She stated that following removal of upper left lateral incisor, the site healed with a deep notch in the gums. Intraoral examination revealed a mild to moderate buccolingual ridge deficiency in missing tooth region, leading to the diagnosis of class I alveolar ridge defect (Fig. 1, 2). Patient had no systemic abnormality. On discussing the condition and findings, she agreed for soft tissue ridge augmentation procedure followed by prosthetic replacement. Thorough scaling and root planning was given to the patient for removal of the local debris,

and patient appointed for surgical phase after 1 months.

**Fig. 1 - Facial & Fig. 2 - View Of Class I Alveolar Ridge Defect**



#### **Surgical Procedure:**

After administering local anaesthesia, incision was given for pouch formation on the alveolar crest in the palatal side of involved area (Fig. 3). This pouch was extended in the apical aspect of alveolar ridge for adequate depth with the help of periosteal elevator. Subepithelial connective tissue graft was harvested from the palatal aspect of left first molar region (Fig.4,5). This connective tissue graft transferred to the preformed pouch that was filled with decalcified freeze dried bone allograft (DFDBA) (Fig. 6, 7). Sutures were taken (Fig. 8). A temporary prosthesis was placed immediately after suturing to adapt contours of soft tissue. Postoperative antibiotics, analgesics, and 0.12% chlorhexidine mouth rinse for 7 days were prescribed to prevent any postoperative discomfort. After 7 days, periodontal pack, and sutures were removed. The surgical site was found to heal without any complication. At 1 and 3 months

postoperative follow-ups, there was uneventful healing, and no decreased in tissue volume was noticed (Fig. 9, 10). The patient was instructed to maintain proper oral hygiene and referred to Prosthodontist for prosthetic requirements. Fixed partial denture was placed (Fig. 11).

**Fig. 3 - Pouch Formation In Involved Site**



**Fig. 4 - Site of Connective Tissue Harvesting**



**Fig. 5 Sub epithelial Connective Tissue Graft**



**Fig. 6 - Bone Graft In Pouch**



**Fig. 7 Subepithelial Connective Tissue In Pouch**



**Fig. 8-Suturing**



**Fig. 9- Healing After 1 Month**

**Fig. 10 - Increase In Buccolingual Width After 3 Months**



**Fig. 11—Prosthesis In Place**

**Discussion:**

A deform ridge may result from tooth extractions, sever periodontal disease, abscess formations, etc.<sup>9</sup> The deformity that exists in the ridge is directly related to the volume of the root structure and associated bone that is missing or has been destroyed. Several soft tissue augmentation techniques have been developed to re-establish natural appearing soft tissue architecture. The following factors should be determined prior to the initiation of therapy- Volume of tissue required to eliminate the ridge deformity, Type of graft procedure to be used, Timing of various treatment procedure, Problem with tissue discolorations and matching tissue colour. Roll flap technique involves the preparation of a de-epithelialized connective tissue pedicle graft, which is subsequently secured in a subepithelial pouch for deformity correction. This procedure is used for small to moderate class I ridge defects in localized area. A depithelialized palatal connective tissue

pedicle flap removed from the adjacent site of collapse ridge, and tucked into the buccal gingival pouch. A pouch is made in the suprapariosteal connective tissue at the labial surface of the ridge. The result of this procedure may be satisfactory but technique may not be convenient due to anatomic considerations and finite tissue thickness.<sup>4</sup> Pouch graft procedure is used for class I type alveolar ridge deformity. For this type of augmentation a subepithelial pouch is prepared in the area of the ridge deformity, into which a free graft of connective tissue is placed and moulded to create the desired contour of the ridge. We have used bone graft (DFDBA) combined with connective tissue harvesting for the pouch technique. Connective tissue grafts give excellent colour match of the surrounding tissue, and due to good blood supply they are well received by the recipient site.<sup>5</sup> Onlay graft are epithelialized free graft, which following placement, receive their nutrition from the de-epithelialized connective tissue of the recipient site. This type of graft is used for large class II and III defects. If necessary, grafting can be repeated at 2-3 months intervals to gradually increase the ridge height. Onlay graft maintains their epithelium over the connective tissue. The graft is secured with its connective tissue base in contact with de-epithelialized recipient site. Significant ridge correction can be achieved by this technique, but due to colour difference between from palatal and gingival tissue, it may create unpleasant aesthetic results. <sup>6</sup> Interpositional grafts are used to correct class I, and mild to moderate class I and II defects. The surgical procedure requires the use a thick, wedge shape connective tissue graft. This graft is then inserted in the recipient bed, creates similar to the pouch procedures by means of partial thickness dissection. The graft is sutured, leaving the epithelial surface at the level of surrounding tissue. <sup>7</sup> Combined onlayinterpositional graft attempt to maximize the benefits of onlay epithelialized graft and subepithelial

connective tissue graft. This type of augmentation is mainly used for class III ridge defects. The submerged connective tissue section of the interpositional graft aids in the revascularization of the onlay section of the graft, thereby gaining a greater percentage of success of the overall graft.<sup>8</sup>Different surgical techniques have shown acceptable aesthetic outcome. Nevertheless, many of these results are case reports or series, and outcome are mainly related to skill of the operator. Generally the published cases show short term results. Long term stability of the regenerated tissues should be proven in longitudinal studies.

**Conclusion:**

This article demonstrates the correction of an un-aesthetic ridge deformity using pouch technique. The pouch method provided adequate volume to establish natural appearing soft tissue architecture. This technique facilitates the ease of graft placement and aesthetic result.

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