

Localized Ridge Augmentation using Autogenous Soft Tissue Onlay Graft: A Case Report

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ABSTRACT

Background: Localized alveolar defects impair prosthetic rehabilitation of damaged area causing esthetic, phonetic and mucogingival problems. Newer techniques have been proposed to treat these defects by hard and soft tissue augmentation procedures. The periodontal plastic procedures can effectively improve the ridge contour and thereby the esthetics and pontic ridge relationship. The autogenous soft tissue onlay graft technique is primarily designed to gain the ridge height. A case report has been presented here for a patient with alveolar ridge defect in the mandibular anterior region corrected with soft tissue ridge augmentation using onlay graft technique.

Keywords: Esthetics; onlay grafts; reconstruction; ridge augmentation.

INTRODUCTION

Soft tissue aesthetics is a major concern for clinicians to satisfy the growing expectations of patients. Sound prosthetic rehabilitation requires a good hard and soft tissue foundation for success. Localized ridge defects pose a major problem in both esthetics and functionality of prosthesis. A deformed ridge may result from tooth extractions, advanced periodontal disease, abscess formations. Esthetic complications involve appearance of unaesthetic black interdental spaces, unnatural thick/long pontic fabricated to compromise the ridge defect and unaesthetic gingival texture.¹

Preoperative classification of a ridge defect according to its expanse, its severity and its form is clinically relevant because such classifications permit establishment of preliminary prognosis for a planned augmentation. Localised ridge defects can be classified qualitatively on the basis of the three dimensional form and semiquantitatively, on the basis of their extent and severity.

Seibert's Nomenclature²

Class I- Horizontal or buccal tissue loss with normal bone height.

Class II- Vertical or apicocoronal tissue loss with normal ridge width.

Class III- Combined horizontal and vertical bone loss

Allen's Nomenclature³

Type A - Vertical or apicocoronal tissue loss with normal ridge width. Type B - Horizontal or buccal tissue loss with normal bone height.

Type C - Combined horizontal and vertical bone loss.

Semiquantitative Classification

Allen et al classified ridge defects according to the degree of severity of alveolar deformities. Mild < 3 mm, Moderate 3-6 mm, Severe > 6mm. Restoration

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Fig 1: Pre operative view.

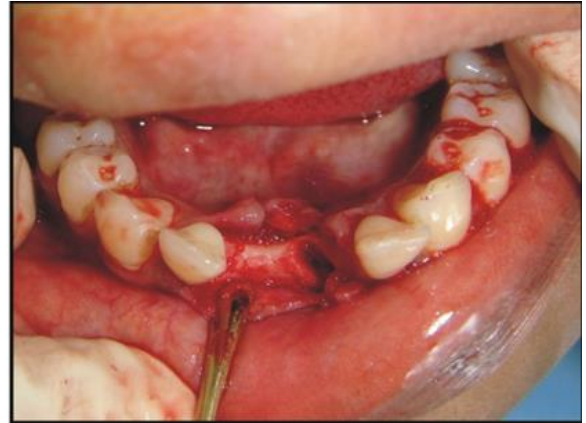


Fig 4: Flap reflection with extraction.



Fig 2: Vestibular deepening.



Fig 5: Template placed on recipient site.



Fig 3: One week post operative.

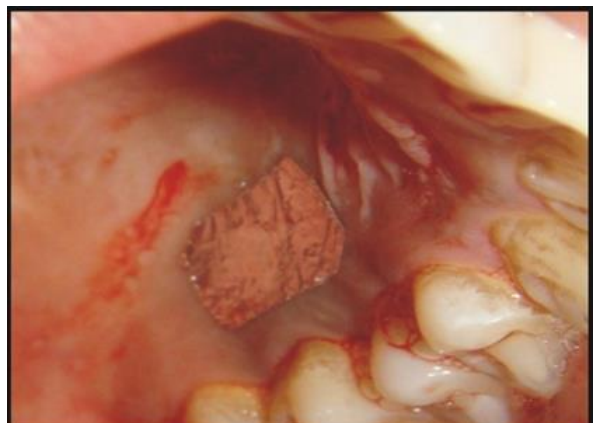


Fig 6: Template adapted over palate.

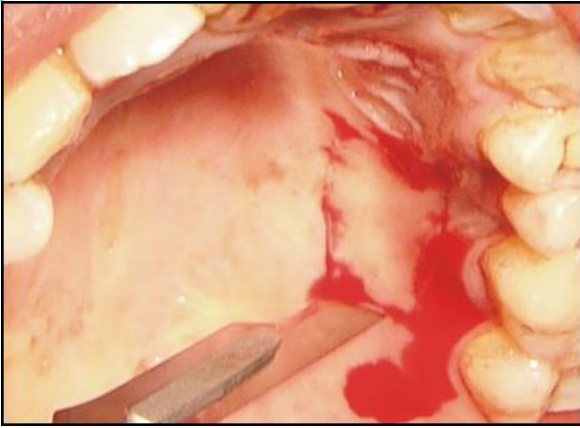


Fig 7: Harvesting graft from palate.



Fig 10: Soft tissue graft placed over recipient site.



Fig 8: Autogenous graft procured.



Fig 11: Graft sutured.



Fig 9: Bone graft placed in extraction socket.



Fig 12: Acrylic stent placed over palate.



Fig 13: Healing of recipient site after 4 weeks.



Fig 14: Healing of donor site after 4 weeks.

of these localized ridge defects is a challenging task for the clinician. Periodontal plastic surgery is a treatment option available for establishing an optimal soft tissue contour to facilitate successful prosthetic reconstruction. Reconstructive procedures for the deformed ridge have evolved to include, guided bone regeneration, bone grafts and soft tissue graft beneath the flap or tunnel in the damaged area and soft tissue onlay grafts.⁴ This case report describes a technique where autogenous soft tissue onlay graft is used for esthetic repair of a ridge defect.

CASE REPORT

A female patient 22 years reported to the Department of Periodontics, Banarasi Das College of Dental Sciences, Lucknow with a chief complaint of missing anterior tooth. She also complaint of mobility and malaligned lower central incisor (Figure 1). Patient revealed the history of extraction of left central incisor 2 years back due to mobility. A

localized ridge defect in relation to mandibular incisors was detected which might affect the esthetics and functional outcome of the prosthesis. On clinical examination, the mandibular alveolar ridge, a Seibert's Class II (1.5mm) was detected (loss of apicocoronal tissue height) with the need to improve the soft tissue contour in the mandibular anterior region. A shallow vestibule was also identified in the mandibular region in relation to the defect. Prior to fabrication of definitive prosthesis it was decided to augment the defect using two stage approach in which vestibular deepening procedure along with localized ridge augmentation procedure was planned. Ridge augmentation was performed using autogenous onlay soft tissue grafting technique to obtain esthetic and prosthetic reconstruction. Informed consent was obtained from the patient before performing surgical procedures.

Surgical procedure

Prior to the surgical procedure, the patient was instructed to rinse for 30 seconds with 10 ml of 0.2% chlorhexidine gluconate solution. The area was anaesthetized using local anaesthetic solution 2% Xylocaine with 1:100000 adrenaline. First stage of surgical procedure, vestibular deepening was performed using Bard Parker Blade No. 15 by placing horizontal incision in the vestibule extending from mandibular right to left lateral incisors (Figure 2). The underlying periosteum was exposed and the underlying fibrous attachment was separated. Coe Pak was placed on the surgical area and patient was re-evaluated after 4 weeks of vestibule deepening (Figure 3).

In the second stage of surgical approach, the area was anaesthetized and crevicular incision was given in relation to 32, 31, 41 and 42 to raise a full thickness periodontal flap. After flap reflection, the malaligned central incisor, i.e., 31 was extracted atraumatically (Figure 4). A tin foil template was placed over the recipient site to determine the amount of graft to be harvested. The size of the template was selected slightly more than the defect size (Figure 5). The palate was selected as the donor site. The template was placed on the palate between the first premolar and the second molar region (Figure 6). Incision was placed along the borders of the template using a Bard parker No. 15 blade (Figure 7). The soft tissue graft containing

epithelium and a thin layer of connective tissue was separated from the palate (Figure 8).

Bone graft (Osseograft™) was placed in the extraction socket in relation to 31 (Figure 9). The soft tissue graft harvested from the palate was then stabilized on the recipient site and adapted firmly (Figure 10). Care was taken to remove the clot and tissue tags at the recipient site. The graft was then sutured using 5-0 resorbable silk sutures (Figure 11). Periodontal dressing was placed on both the recipient and the donor sites and a prefabricated acrylic stent was given at donor site (Figure 12).

After the surgery, antibiotics and analgesics were prescribed to the patient. The patient was instructed not to brush in the surgical area and was advised to rinse with 0.2% chlorhexidine twice daily for 10 days. The sutures were removed after 10 days. The patient presented with satisfactory soft tissue healing and there were no post operative complications. The patient was re-evaluated after 4 weeks and a gain in the apicocoronal height of the ridge was observed (Figure 13,14).

DISCUSSION

Soft tissue augmentation with autogenous grafts is a widely accepted procedure in dentistry. It is indicated in both partially and fully edentulous patients to augment areas with a lack of or a reduced width of keratinized tissue, as well as to increase soft tissue volume.⁵

In the present case, Siebert Class II defect was present with a bucco-lingual and apico-coronal defect that might lead to the esthetic compromise of fixed partial denture and food impaction in the pontic region. Soft tissue onlay graft was considered as treatment modality rather than opting for hard tissue augmentation.⁶

Onlay grafts are epithelized free grafts which, following placement, receive their nutrition from the de-epithelized connective tissue of the recipient site. The amount of apico-coronal augmentation that can be obtained is related to the initial thickness of the graft, the events of wound healing process, and the amount of graft tissue that survives. Onlay grafts can also be used to treat other mucogingival problems like inadequate width of attached gingiva and root coverage procedures. It is a relatively simple procedure and does not require

the use of expensive biomaterials as the graft can be procured from patients own oral cavity.⁵

Onlay graft procedures also have limitations such as insecure prognosis of the gain in volume and esthetically unsatisfactory shade and texture as they retain their palatal mucosal characteristics. They are not suited for use in areas where blood supply to the recipient site has been compromised by extensive scar formation from previous surgical procedures or trauma. Hence these thick grafts require an abundant blood supply and thus there are high chances of graft sloughage and color mismatch being the major drawback.⁷

A major disadvantage of connective tissue graft is a need for the second surgical site however leaving palatal epithelium with a base of connective tissue will allow the site to heal by primary intention, thereby minimizing post-operative complications. Moreover, alveolar ridges augmented with connective tissue grafts have demonstrated stability for 7-12 years.^{8,9}

CONCLUSION

Reconstruction of the deformed alveolar ridge preceding prosthetic rehabilitation can provide the clinician with more ideal gingival contour and preclude the need for modifications or compromises in the final prosthesis. This clinical report suggests that soft tissue augmentation with autogenous connective tissue onlay graft harvested from the palate is a viable treatment to provide aesthetically acceptable contours to the alveolar ridge & an effective restoration.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

REFERENCES

1. Seibert JS, Cohen WD. Periodontal considerations in preparation for fixed and removable prosthodontics. *Dent Clin North America* 1987;31:529-55.
2. Seibert JS. Reconstruction of deformed partially edentulous ridges, using full thickness onlay grafts. Part I Technique and wound healing. *Compend Cont Ed Gen Dent* 1983;4:437-53.

3. Allen E, Gianza C, Farthing G, Newbold D . Improved technique for localized ridge augmentation a report of 24 cases. J Periodontol 1985;56:195-9.
4. Thoma DS, Benić GI, Zwahlen M, Hammerle CHF, Jung RE. Clin Oral Implant Res 2009;20(Supplement Issue):146-65.
5. Prathap S, Hegde S, Nair P, Hosadurga R, Boloor VA. Localised ridge augmentation using soft tissue onlay graft: A Case Report. Int J Health Rehab Sci 2013;2(1):66-71.
6. Khoury F, Happe A. The palatal subepithelial connective tissue flap method for soft tissue management to cover maxillary defects: A clinical report. Int J Oral Maxillofac Implants 2000;15:415-8.
7. Seibert JS. Treatment of moderate localized alveolar ridge defects. Dent Clin North Am 1993;37(2):265-280.
8. Mesimeris V, Davis G. Use of subepithelial connective tissue grafts in combined periodontal prosthetic procedures. Periodontal Clin Investig 1996;18:12-5.
9. Seibert JS. Ridge augmentation to enhance esthetics in fixed prosthetic treatment. Compendium 1991;12:548-61.