

## CASE REPORT

# Amalgamation of Function, Comfort, and Esthetic Dentistry in Patient with Ridge Defect: A Case Report with Multidisciplinary approach

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## ABSTRACT

Resorption of the edentulous or partially edentulous alveolar ridge or bone loss due to periodontitis, wearing dentures, developmental defects, injury, or trauma frequently compromises implant placement or fixed partial denture (FPD) fabrication in a prosthetically ideal position. Trauma due to road traffic accidents to dentoalveolar structures following immediate nonreplacement often poses a difficult esthetic and treatment planning problem for clinicians. Age, location, space limitations, alveolar ridge deficiencies, uneven gingival margins, occlusion, and periodontal factors often necessitate an interdisciplinary approach. Moreover, patient's socioeconomic status dictates the treatment plan and its follow-up. The aim of this case report was to restore esthetics and function of a patient within their financial limitations.

**Keywords:** Restoring esthetics, Ridge augmentation, Trauma to dentoalveolar structures.

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## INTRODUCTION

Ridge augmentation is a common dental procedure often performed to help recreate the natural contour of the gums and jaws that may have been lost due to bone loss as a result of tooth extraction or due to any other reason. Resorption of the edentulous or partially edentulous alveolar ridge or bone loss due to periodontitis, wearing dentures, developmental defects, injury, or trauma frequently compromises fixed partial denture (FPD)

fabrication or implant placement in a prosthetically ideal position.<sup>1</sup>

Alveolar ridge defects that result from trauma, tooth extraction, or periodontal diseases often require periodontal-surgical correction before prosthetic treatment. Especially, in the esthetically important anterior arch segments, any surgical endeavor will require implants (osseous buildup) or fixed bridge constructions (soft tissue buildup) for the placement of pontics. Of course, smaller defects, especially the less esthetically sensitive posterior segment, can be remained untreated and/or be covered by a removable prosthesis. If dental implants or fixed bridgeworks are planned, such ridge defects must be carefully evaluated, classified, and corrected if indicated. Any failures or mistakes in any of these procedures will lead to unacceptable structural, functional, and, above all, esthetic compromises. Therefore, a classification of alveolar ridge defects was proposed by Siebert in 1983 and Allen et al<sup>14,16</sup> in 1985 representing H as Horizontal defects, V as Vertical defects, and C as Combination defects (Table 1).<sup>2,3</sup>

## CASE REPORT

A 21-year-old male patient was reported to the Department of Prosthodontics for replacement of his maxillary anterior teeth. He had lost his teeth 7 years back due to a road traffic accident. Since then he was using a removable partial denture, as FPD was contraindicated for his pulpal concern. In between, an orthodontic correction for his malaligned teeth was suggested and completed. Meanwhile, the patient was not satisfied with the retention and esthetics of his removable prosthesis; hence, an FPD was planned for his missing teeth.

**Table 1:** Classification of alveolar ridge defects

Alveolar ridge defects – Qualitative classification		Siebert nomenclature, 1983	Allen nomenclature, 1985
Horizontal	Labiolingual defect with normal ridge height	Class I	Type B
Vertical	Corono-apical defect with normal ridge width	Class II	Type A
Combination	Horizontal + vertical ridge defect	Class III	Type C

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The intraoral examination revealed missing 11, 12, 13, and 14 teeth, with Siebert's class III defect showing about 4 mm horizontal and 6 mm vertical bone loss. Also, a dental midline was slightly deviated from facial midline and the space available was sufficient to replace only three teeth. So, an FPD with respect to 22, 21, 11, 12, 13, and 15 was planned along with hard tissue ridge augmentation followed by soft tissue ridge augmentation.

**PROCEDURE**

Tooth preparation with respect to 22, 21, and 15 was done following standard principles and guidelines. Permanent provisional restorations were fabricated using heat cure acrylic resins. Following this, hard tissue ridge augmentation was done using an allograft (Fig. 1). These provisional restorations were retained for 8 months, and at this point of time, ridge deficiency of 3 mm was seen (Fig. 2). After an 8-month healing period, the membranes

were removed in conjunction with the second-stage surgical procedure. Before soft tissue augmentation, the width of ridge defect was measured using aluminum foil. The donor site was decided to be from anterior slopes of hard palate which is rich in vascularity and tissue graft was sectioned by placing aluminum foil over it (Figs 3 to 5). The sectioned tissue was placed in defect area and sutured (Fig. 6). Patient was checked at periodic recalls for healing process, and tissues were healed well and in place after a month (Figs 7 and 8). Following the healing period, an FPD was fabricated and cemented (Figs 9 and 10). The measurements demonstrated an average of vertical ridge augmentation of up to 5 mm. Pink-colored gingival porcelain was added in lateral incisor area to compensate tissue regression seen after healing period (Fig. 11). Midline of the fixed prosthesis was aligned with facial midline, rather than dental midline, to maintain the symmetry of face. The patient was happy and satisfied (Fig. 12).



**Fig. 1:** Hard tissue ridge augmentation



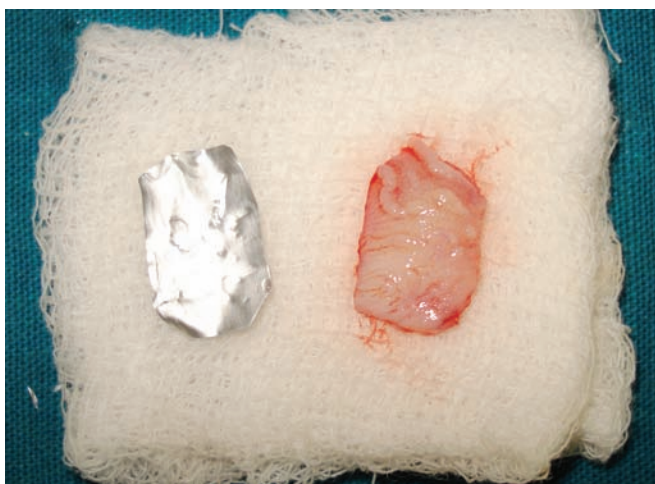
**Fig. 2:** A 3 mm of ridge deficiency seen after hard tissue ridge augmentation



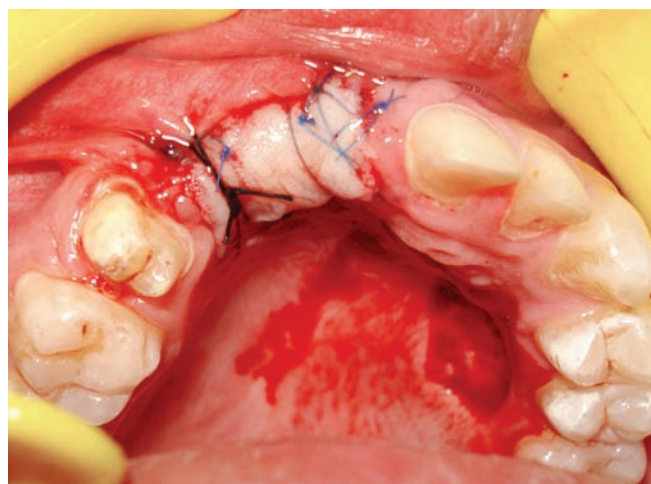
**Fig. 3:** Donor site preparation



**Fig. 4:** Sectioning of tissue graft rich in vascularity



**Fig. 5:** Sectioned tissue graft



**Fig. 6:** Suturing of tissue graft in defect area



**Fig. 7:** Follow-up after a month (labial aspect)



**Fig. 8:** Healing of tissue graft on palatal aspect



**Fig. 9:** Cementation of final prosthesis (labial view)



**Fig. 10:** Cementation of final prosthesis (palatal view)

## DISCUSSION

Esthetic reconstruction of large-volume class III ridge deformities where bone and soft tissue have been lost horizontally as well as apicocoronally, continues to

offer a major challenge in therapy to those engaged in advanced reconstructive dentistry. No single procedure is well suited for solving all problems in such cases. A series of staged surgical procedures is frequently



**Fig. 11:** Final Prosthesis with gingival porcelain



**Fig. 12:** Happy and satisfied patient

necessary to augment the ridge to its former dimensions. The regeneration of the missing osseous and soft tissue structure was accomplished to support the future esthetic soft tissue contours. This ridge augmentation technique significantly increased the functional and esthetic outcome of the final FPD by restoring the alveolar ridge defect to its original dimension, and gain in ridge width was 5 mm.<sup>4-15</sup>

## CONCLUSION

This clinical report describes hard and soft tissue ridge augmentation along with orthodontic therapy for treatment of alveolar bone defect to enhance the esthetic as well as functional result for an FPD. Postoperative examinations showed improvement in the alveolar bone contour. This amalgamation of dentistry in function, comfort, and esthetics offers promise in solving many of the problems encountered in gaining predictable treatment outcome in such patients with class III defects.

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