SINGLE-STAGE CONTOUR AUGMENTATION AND IMPLANT PLACEMENT: A CASE REPORT

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ABSTRACT

Tooth loss in the anterior maxilla poses significant aesthetic and functional challenges, especially when associated with alveolar ridge defects. This case report describes the management of a 34-year-old female patient presenting with an 8-month history of a missing right maxillary central incisor, including a mild horizontal ridge deficiency. A one-stage contour augmentation using guided bone regeneration (GBR) was performed simultaneously with implant placement. The case illustrates the clinical steps, graft materials used, and the successful osseointegration and prosthetic restoration outcome after six months. This approach minimized treatment duration while achieving favourable aesthetic and functional results.

INTRODUCTION

Tooth loss in the anterior maxilla poses significant aesthetic and functional challenges, especially when associated with alveolar ridge defects. Implant placement in the anterior maxilla is challenging due to aesthetic demands and frequent ridge deficiencies. Horizontal ridge augmentation is often required to restore adequate bone volume for optimal implant positioning and soft tissue support. Traditionally, staged procedures were favored; however, one-stage contour augmentation with immediate implant placement has gained popularity for reducing treatment time, patient morbidity, and cost. This approach is indicated in cases with mild-to-moderate horizontal defects and sufficient vertical bone for primary implant stability.[1,2]

CASE PRESENTATION

Patient Profile:

A 34-year-old healthy female presented to the department of oral implantology with a chief complaint of a missing upper right front tooth (tooth #11) for the past 8 months following trauma. The patient expressed concern about aesthetics and desired a fixed solution.

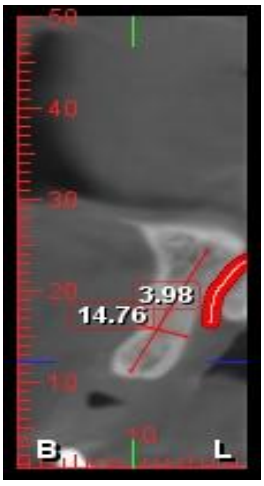
Clinical Examination:

Intraoral examination revealed a missing maxillary right central incisor with moderate horizontal alveolar ridge deficiency (Seibert Class I). The soft tissue

profile showed mild contour collapse with adequate keratinized tissue. The adjacent teeth were healthy with no signs of mobility or periodontal disease. Blood investigation was performed which revealed no abnormalities.

Radiographic Evaluation:

Cone Beam Computed Tomography (CBCT) revealed a horizontal defect in the alveolar ridge with sufficient vertical bone height (>12 mm) but inadequate width (<4 mm) for ideal implant placement.

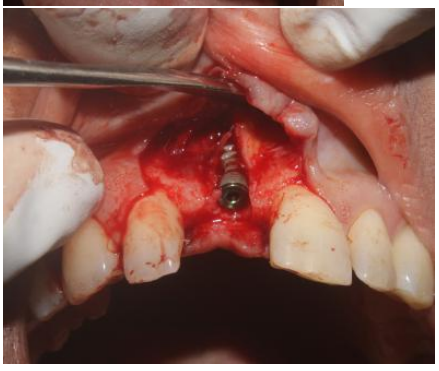


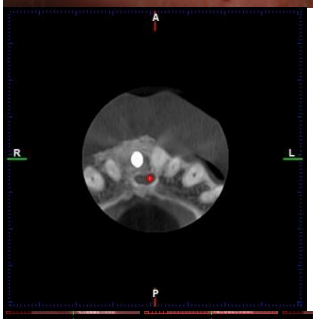
Treatment Plan:

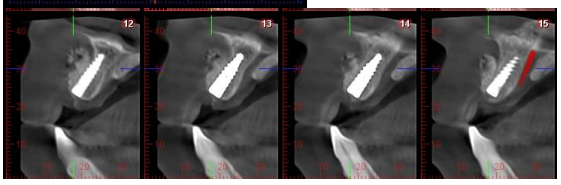
A one-stage procedure involving horizontal ridge augmentation using guided bone regeneration and simultaneous implant placement was planned. The patient was informed of the risks, benefits, and alternatives, and informed consent was obtained.

Surgical Procedure:

Under local anesthesia (Lidocaine Hydrochloride 2% with adrenaline 1:80,000 USP), a full-thickness mucoperiosteal flap was elevated to expose the defect site. A 3.5 mm x 13 mm titanium dental implant (Alpha Bio®) was placed in the ideal prosthetic position, engaging the apical native bone for primary stability (>35 Ncm insertion torque).
Contour augmentation was performed using a mixture of autogenous bone chips harvested from the adjacent site and xenograft (Bio-Oss®). A resorbable collagen membrane (Bio-Gide®) was adapted over the graft to stabilize it and prevent soft tissue ingrowth. The flap was advanced and sutured using PTFE suture material for tension-free primary closure.



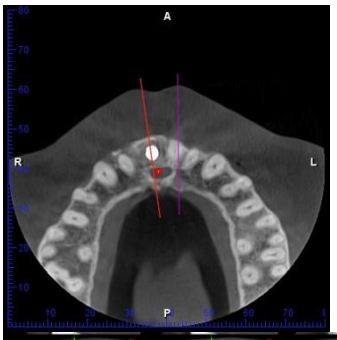


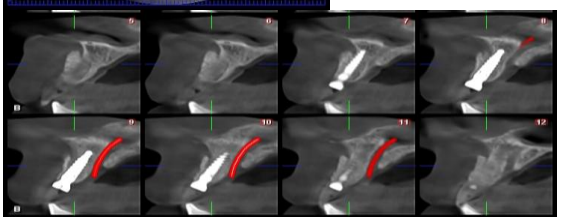


Post-operative Care:

The patient was prescribed antibiotics (amoxicillin 500 mg TID for 5 days), analgesics, and chlorhexidine mouth rinse. She was advised to avoid mechanical pressure on the surgical site.

Follow-up and Healing:
Postoperative healing was uneventful with no signs of infection or graft exposure. At 6 months, CBCT confirmed horizontal ridge augmentation with adequate buccal contour and implant integration.

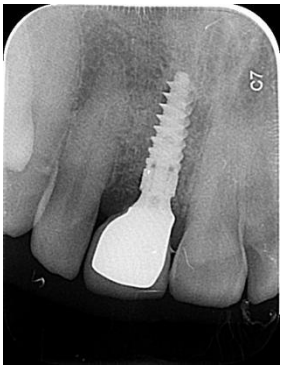




Prosthetic Phase:

A healing abutment was placed after uncovering the implant. Shade selection was done.Two weeks later, a screw-retained porcelain fused to metal crown was delivered. The emergence profile and gingival aesthetics were satisfactory.

Outcome:
At 12-month follow-up, the implant remained stable with healthy peri-implant soft tissues and excellent patient-reported satisfaction regarding function and aesthetics.



DISCUSSION

Implant placement in the anterior maxilla is challenging due to aesthetic demands and frequent ridge deficiencies. Horizontal ridge augmentation is often required to restore adequate bone volume for optimal implant positioning and soft tissue support.2,3

Traditionally, staged procedures were favored; however, one-stage contour augmentation with immediate implant placement has gained popularity for reducing treatment time, patient morbidity, and cost. This approach is indicated in cases with mild-to-moderate horizontal defects and sufficient vertical bone for primary implant stability.4

This case highlights the predictability of guided bone regeneration using a combination of autogenous and xenograft materials and resorbable membranes in such scenarios. The simultaneous approach requires precise flap management, meticulous graft stabilization, and careful case selection to avoid complications such as graft exposure or implant failure.5 Long-term success is enhanced by proper prosthetic planning, soft tissue management, and patient compliance with oral hygiene.

CONCLUSION

One-stage contour augmentation with simultaneous implant placement is a viable and effective treatment option in selected cases with moderate alveolar ridge deficiencies. It offers a faster route to functional and aesthetic rehabilitation while maintaining high success rates.

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