

Immediate Implant Placement with Autogenous Symphysis Graft in an 18-Year-Old Following Anterior Maxillary Trauma: A Case Report

Dr. Harmeet Bhupinder Passi¹, Dr. Alok Bhardwaj², Dr. Ashish Chalana^{3*}, Dr. Sarjeet Kumar⁴

¹ Senior Lecturer, Department of Oral and Maxillofacial Pathology, NIMS DENTAL COLLEGE, JAIPUR.

² Reader, Oral and Maxillofacial Surgery, NIMS DENTAL COLLEGE, JAIPUR.

³ Senior Lecturer, Oral & Maxillofacial Surgery, NIMS DENTAL COLLEGE, JAIPUR.

Email: drashishchalana@gmail.com

⁴ Senior Lecturer, NIMS DENTAL COLLEGE, JAIPUR.

ABSTRACT

Traumatic injuries involving the anterior maxilla frequently lead to combined loss of teeth and supporting bone, posing both functional and aesthetic challenges—particularly in young individuals. This report presents the management of an 18-year-old patient who sustained a road traffic accident resulting in fracture of maxillary central incisors (11 and 21) with associated alveolar bone deficiency. The treatment protocol included careful extraction of non-restorable teeth, reconstruction of the osseous defect using an autogenous graft harvested from the mandibular symphysis, stabilization with self-drilling mini screws, and immediate placement of dental implants. Favorable healing, successful integration of the graft and implants, and satisfactory aesthetic restoration were observed. This approach demonstrates a reliable solution for simultaneous hard tissue reconstruction and implant rehabilitation in selected young patients.

Keywords: Anterior maxillary trauma, immediate implant placement, autogenous bone graft, symphysis graft, dental implants, adolescent patient

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INTRODUCTION

Injuries to the anterior maxillary region are commonly encountered in high-impact incidents such as road traffic accidents. Such trauma often results in fracture or loss of anterior teeth accompanied by varying degrees of alveolar bone destruction. In younger patients, the consequences extend beyond functional impairment to significant aesthetic and psychological concerns.

The concept of placing implants immediately into fresh extraction sites has evolved as a viable treatment option aimed at minimizing treatment duration and preserving existing bone and soft tissue contours. However, the presence of bone defects may compromise implant stability, necessitating augmentation procedures.

Among various grafting options, autogenous bone—particularly from the mandibular symphysis—is widely preferred due to its inherent biological advantages, including osteogenic capability and rapid integration. The present case highlights a combined approach involving immediate implant placement and simultaneous

reconstruction using a chin graft in a late adolescent patient.

Case Report

Patient Details

An 18-year-old male presented with a history of facial trauma following a road traffic accident. The primary complaint was fractured upper front teeth and compromised facial aesthetics.

Clinical Examination

Intraoral assessment revealed:

- Severely fractured maxillary central incisors (11 and 21), deemed non-restorable
- Evidence of soft tissue injury in the anterior maxilla
- Loss of labial cortical bone in the affected region
- Localized tenderness on palpation

Radiographic Assessment

Periapical imaging demonstrated root fractures with surrounding bone loss

Cone beam computed tomography confirmed deficiency of the labial plate and reduced bone volume for implant placement

Treatment Strategy

Considering the clinical and radiographic findings, a single-stage surgical intervention was planned comprising:

- Removal of fractured teeth
- Thorough debridement of the defect
- Harvesting of autogenous bone from the chin region
- Stabilization of graft using mini self-drilling screws
- Immediate placement of implants in 11 and 21 regions
- Delayed loading with prosthetic restoration

Surgical Technique

Tooth Extraction

The affected teeth were removed with minimal trauma to preserve the residual alveolar bone structure.

Site Preparation

Following extraction, the socket and surrounding area were debrided to eliminate debris and granulation tissue.

Graft Harvesting

A corticocancellous bone block was obtained from the mandibular symphysis under aseptic conditions, ensuring protection of adjacent anatomical structures.

Graft Adaptation and Fixation

The harvested graft was shaped according to the defect and secured firmly at the recipient site using titanium self-drilling screws.

Implant Placement

Implant osteotomies were prepared to engage native apical bone, followed by placement of implants with adequate primary stability.

Closure

The mucoperiosteal flap was repositioned and sutured to achieve tension-free closure. A temporary prosthesis was provided without occlusal loading.

Postoperative Imaging

Follow-Up and Outcome

Healing was uneventful, with no signs of infection or graft failure. Progressive bone integration was observed over subsequent visits.

At 3 months:

- Stable peri-implant bone levels
- Healthy soft tissue contours

Final prosthetic rehabilitation was completed between 4–6 months, yielding satisfactory functional and aesthetic results.

DISCUSSION

The management of anterior maxillary trauma requires a balance between functional rehabilitation and aesthetic restoration. Immediate implant placement offers the advantage of reducing treatment time and preserving tissue architecture. However, its success is contingent upon achieving sufficient primary stability, which can be challenging in cases with bone loss.

In the present case, augmentation using an autogenous chin graft provided structural support and enhanced the stability of implants. The symphysis region is particularly advantageous due to ease of access, adequate bone volume, and favorable healing characteristics.

For younger patients, it is essential to confirm the completion of craniofacial growth before implant placement to avoid future complications related to infraocclusion. In this case, clinical assessment indicated suitability for implant therapy.

Immediate implant placement in the anterior maxilla following trauma has been extensively studied, with consistently high survival outcomes when proper case selection and surgical protocols are followed.

Key Evidence-Based Statistics

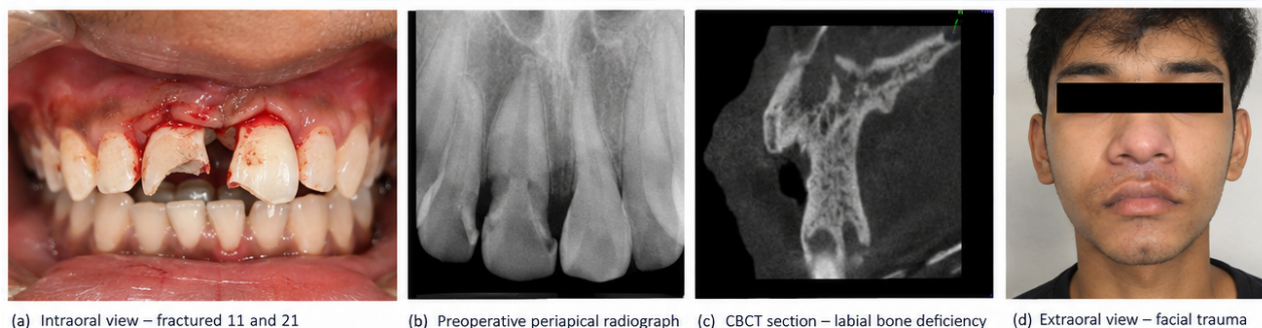
- A retrospective clinical study (32 patients) reported a **100% implant survival rate at 1 year**, with minimal marginal bone loss (~0.17–0.22 mm) ¹¹
- A larger cohort study (70 implants) demonstrated a **95.7% survival rate over 3 years** ¹²
- Systematic review of 26 RCTs (1326 implants) showed **overall success rates between 96.7% and 100%** ¹³
- Meta-analysis data suggests:
 - o Immediate implants: **~94.9% survival**
 - o Delayed implants: **~98.9% survival** ¹¹
- Immediate loading protocols show slightly lower success (~92.9%) compared to delayed loading (~97.6%) ¹⁴

Overall, the combined approach proved effective in restoring both function and aesthetics in a single surgical phase.

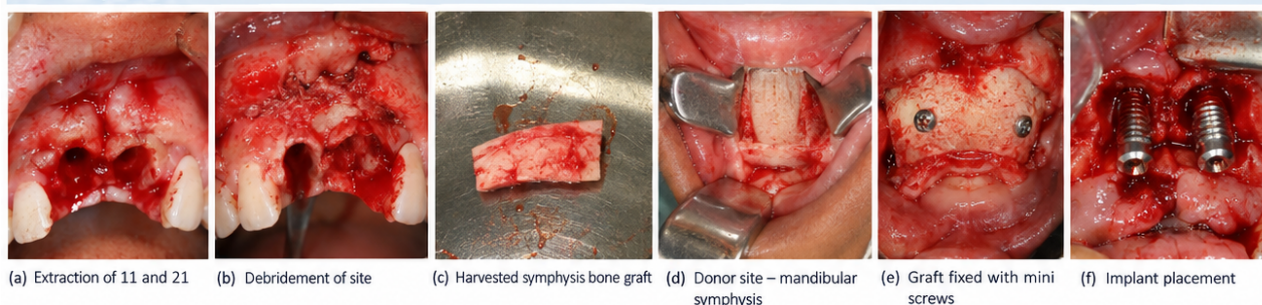
CONCLUSION

Simultaneous use of autogenous bone grafting and immediate implant placement represents a dependable treatment modality for anterior maxillary trauma with bone deficiency in carefully selected young patients. This technique allows for efficient rehabilitation while maintaining favorable aesthetic outcomes.

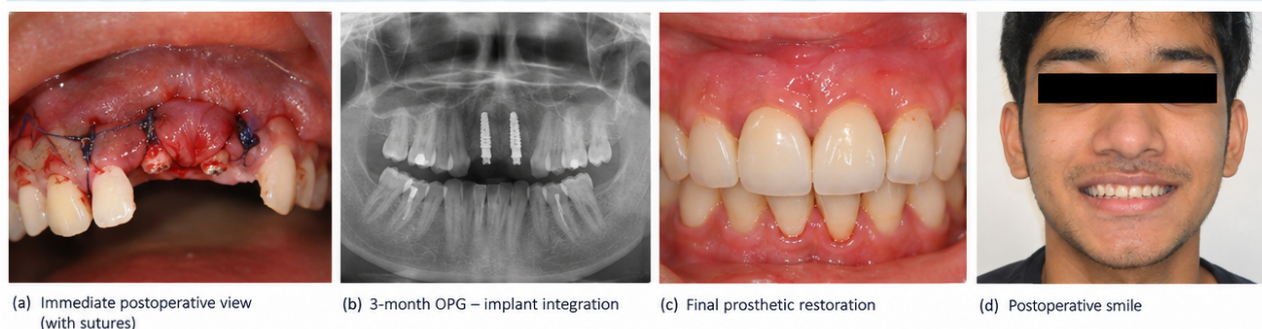
1. Preoperative Assessment



2. Intraoperative



3. Postoperative



1. **Figure 1:** Preoperative intraoral photograph + IOPA + CBCT
2. **Figure 2:** Extraction and post-extraction defect
3. **Figure 3:** Symphysis graft harvesting
4. **Figure 4:** Graft fixation with mini screws
5. **Figure 5:** Immediate implant placement
6. **Figure 6:** Sutured postoperative site
7. **Figure 7:** Immediate postoperative IOPA/OPG
8. **Figure 8:** 3-month follow-up radiograph showing osseointegration
9. **Figure 9:** Final prosthetic restoration

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