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Immediate Implant Placement: Time to Smile Proficiently (Case Series)

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Abstract: ***Aim & Objective: To evaluate the predictability of immediate implant placement in post - extraction cases, particularly in minimizing post - extraction and implant - related bone resorption while optimizing esthetic and functional outcomes. Methodology: Three cases were examined, each with at least six months of follow - up after implant placement. The focus of the study was on the following outcomes: 1) Implant integration 2) Aesthetic and functional results. Results: Immediate bone augmentation proved to be effective, but it was noticed that cases with thin tissue types, implant misalignment, or buccal bone defects still showed some recession in the buccal gingiva. All patients kept up with good oral hygiene, and both soft tissue stability and implant integration stayed consistent at the six - month mark. Conclusion: Immediate implant placement can lead to greater comfort, quicker healing, and better maintenance of gum structure for improved aesthetic results. Nonetheless, the long - term success of this approach relies on careful selection of cases, thorough planning, skilled surgical techniques, and proper post - operative care. When executed following the right protocols, it remains a dependable and predictable option for replacing missing teeth.***

Keywords: Immediate implant, post extraction, osseointegration, bone augmention, tissue biotype

1. Introduction

The International Congress of Oral Implantologists (ICOI) Glossary of Implant Dentistry defines immediate implant placement as putting in an implant right after a tooth is extracted. This method reduces the need for extra surgeries, shortens the treatment time, and helps keep both soft and hard tissues intact, which enhances patient comfort. The idea of osseointegration, first introduced by Branemark [1] back in 1952, transformed the field of implant dentistry by creating a functional link between bone and titanium implants. Traditional two - stage procedures, such as Branemark's [2], have raised some concerns, including:

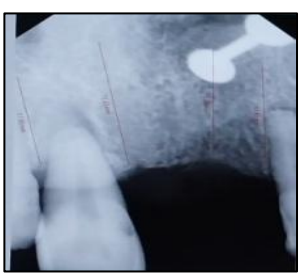
- Alveolar bone loss, particularly in the first year after extraction, with a 25% loss in volume and a 4 mm reduction in ridge height[3].
- Prolonged periods without teeth and longer treatment timelines.
- Increased anxiety for patients due to having multiple surgical interventions.

Since the 1970s, immediate implant placement has become more popular, largely because patients want quicker treatments and better results. However, the success of this approach hinges on careful case selection, precise surgical techniques, and thorough post - operative care.

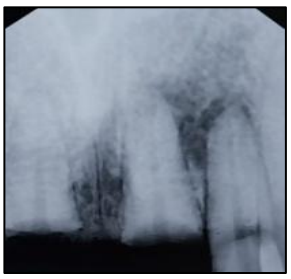
2. Methodology

Case Selection

Three cases were selected from the Outpatient Department (OPD) of Periodontology, Guru Nanak Dev Dental College and Research Institute, Sunam. Patients were followed up for 6 months post - implantation. The cases selected had failing tooth structures due trauma or failed root canal that fulfilled the criteria of inclusion.



Case I



Case II

Case III

Inclusion Criteria

- Failing tooth/teeth in the maxilla or mandible.
- Sufficient bone volume with an intact buccal and lingual wall to support an implant (≥7 mm length).
- Infection - free implant site.
- Good oral hygiene and adequate prosthetic space (mesio - distal, bucco - lingual, and interocclusal).
- Patients capable of understanding and providing informed consent.

Exclusion Criteria

- Medical contraindications for surgery.
- Uncontrolled periodontal disease.
- Bruxism.
- Active smokers.
- History of radiotherapy to the head and neck.

3. Surgical Protocol

Preoperative Preparation

Before surgery, it's important to administer antibiotic prophylaxis. For the general patient, Amoxicillin - clavulanate (1 g) should be given an hour prior, while Clindamycin (600 mg) is a good alternative for those allergic to penicillin. Additionally, patients should use a 0.2% chlorhexidine mouthwash for oral disinfection, ideally twice a day for 10 days.

Surgical Procedure

- Local anesthesia was administered effectively.
- An atraumatic extraction was performed.
- Special care was taken during the tooth extraction to maintain the integrity of the alveolar bone.
- After removal, both the hard and soft tissue conditions of the socket were assessed.

Implant Site Preparation

- A surgical template ensured the implant was positioned accurately based on prosthetic requirements.
- The interradicular bone was prepared following the manufacturer's guidelines.
- Finally, the last twist drill was placed, making sure it had 3–5 mm of apical engagement in the host bone to secure primary stability.

Implant Placement

- The diameters for the implants ranged from 3.5 to 4.2 mm.
- Implant lengths were between 10 and 11.5 mm, depending on the height of the available bone.
- The primary stability of at least 35 Ncm was found to be attained, which was measured with a manual torque wrench.
- A cover screw from Adin Implants was then placed.

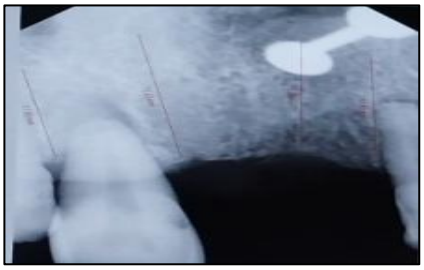
Optimal Implant Positioning Guidelines

- In terms of apico - coronal positioning, the implant should be placed 2–3 mm below the CEJ of neighboring teeth or the gingival margin, especially if there's any recession present.
- Bucco - lingually, it should maintain a distance of at least 2 mm from the labial bone.
- Finally, there should be a clearance of 1.5–2 mm mesio - distally from adjacent teeth.

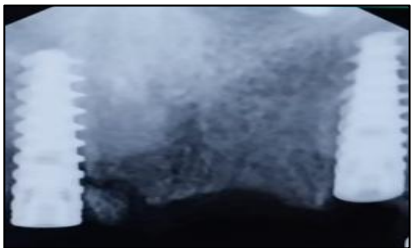
Suturing & Post - Operative Care

- For wound closure, Ethicon 4 - 0 vicryl sutures from Johnson & Johnson, USA were used.
- A follow - up appointment was scheduled for one week later to remove the sutures and evaluate the healing progress.

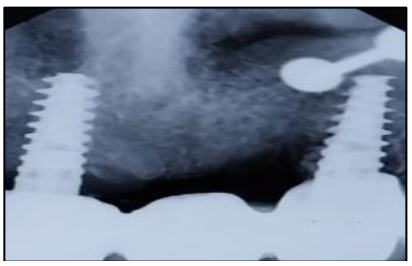
Case I



Pre - OP



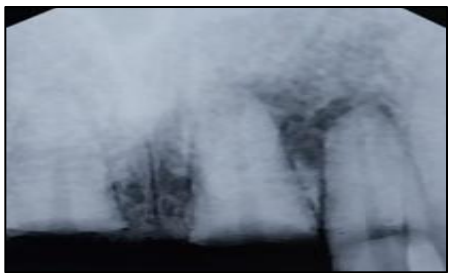
Post - OP



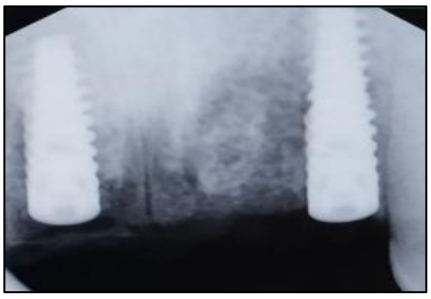
After 6 Months

After Prosthesis

Case II



Pre – OP



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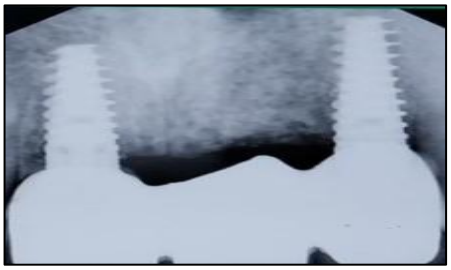
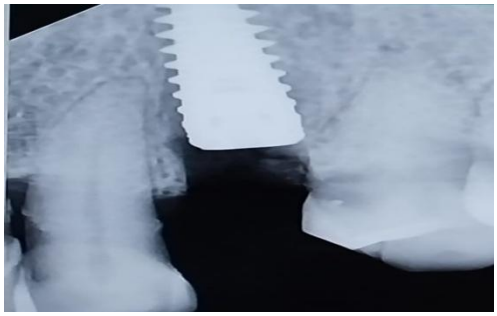


After 6 Months

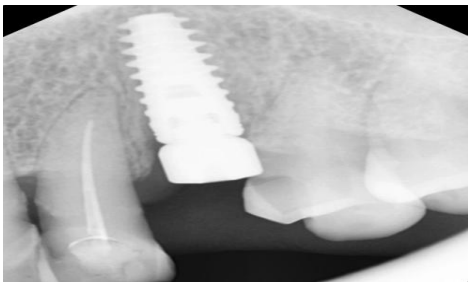
After Prosthesis

Case III

PRE – OP



POST – OP



After 6 Months

After Prosthesis

4. Results

Bone augmentation techniques proved to be effective when done right after tooth extraction. However, there were instances of ongoing buccal gingival recession, particularly in patients with:

- A thin tissue biotype.
- An implant placed in a buccal malposition.
- A thin or compromised buccal bone wall.

No major differences were found when comparing the baseline with the follow - ups at six months. Throughout the study, plaque levels stayed low, and gingival health was consistently preserved.

5. Discussion

Immediate implant placement has several benefits, such as:

- Shorter treatment times and fewer surgeries.
- Keeping the gum structure intact leads to better aesthetic results
- Increased comfort for patients when compared to traditional staged procedures.

That said, achieving successful results hinges on a few crucial factors:

- Careful selection of cases (enough bone volume and ensuring the site is free of infection).
- Using the right surgical techniques (like placing the implant accurately and ensuring it has primary stability).
- Managing potential risk factors attentively (for instance, understanding tissue biotype and the thickness of the buccal bone).
- Diligent post - operative care (like keeping up with oral hygiene and attending follow - up appointments).

Research indicates that periapical lesions are not suitable for quick implant placements, as noted by Tolman and Keller5. When it comes to the healing process, epithelial growth starts around 1 to 2 weeks, collagen fibers begin to organize between 4 to 6 weeks, and the overall healing wraps up by 6 to 8 weeks. It's worth mentioning that the study showing these results was done on dogs, which tend to heal more quickly than humans[8].

Role of Surgical Guides in Implant Placement

Using surgical guides can greatly improve precision, resulting in a more predictable and visually appealing outcome. Although some experts have recommended using the existing socket as a reference for immediate implant placement, this method usually isn't advised. Unlike natural

teeth, implants need to be placed with careful consideration of both prosthetic and biomechanical factors[4].

If an implant is inserted directly into the extraction socket without optimal angulations, it often ends up needing an angled abutment for the final restoration. This can lead to:

- Unfavorable biomechanical forces that increase stress on the implant.
- A higher risk of bone loss due to improper load distribution.
- Potential implant failure down the line.

When it comes to ridge preservation and bone augmentation during immediate implant placement, Werbitt and Goldberg (1992) pointed out that immediate implant placement might help maintain ridge contours, although their conclusion largely stemmed from a handful of human case studies. One issue with immediate placement is the gap between the implant and the extraction socket, which has to be carefully managed to avoid bone resorption and soft tissue collapse[6].

To improve osseointegration and support ridge preservation, this gap can be filled with:

- Bone grafts (like demineralized freeze - dried bone, autogenous bone, hydroxyapatite, or anorganic bovine bone).
- Barrier membranes (either resorbable or nonresorbable).
- A combination of a membrane and bone graft to boost bone regeneration and aid in soft tissue healing[4, 9].

6. Conclusion

Immediate implant placement is a viable and predictable treatment option when appropriate case selection, surgical expertise, and post - operative care are ensured. While it offers significant advantages, careful management of buccal recession risks and implant positioning remains crucial for long - term success. Further studies with larger sample sizes and extended follow - ups are needed to validate these findings.

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