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IMMEDIATE IMPLANT PLACEMENT IN THE AESTHETIC ZONE: A CASE-BASED APPROACH

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Abstract

Immediate implant placement in the anterior maxilla presents both an opportunity and a challenge due to high aesthetic demands and anatomical limitations. This case report describes the clinical management of a patient requiring tooth extraction and immediate implant placement in the aesthetic zone. Atraumatic extraction was performed to preserve the alveolar bone, followed by precise implant placement. Particular attention was given to the soft tissue architecture and buccal bone integrity to optimize aesthetic outcomes. The case demonstrates the importance of proper case selection, surgical technique, and prosthetic planning in achieving predictable functional and aesthetic success. Follow-up over 12 months showed stable peri-implant tissues and satisfactory patient-centered results, highlighting the viability of immediate implantation in carefully selected cases within the aesthetic zone.

***Keywords:* Immediate implant placement, aesthetic zone, Implant aesthetics, Socket preservation, Atraumatic extraction.**

Introduction

Dental implants are a well-established solution for the replacement of missing teeth, offering long-term functional and aesthetic benefits. Immediate implant placement—defined as implant insertion at the time of tooth extraction—has become increasingly popular due to its advantages in reducing overall treatment time, preserving alveolar bone, and maintaining soft tissue contours.

In the anterior maxilla, also known as the aesthetic zone, immediate implant placement presents specific clinical challenges. The thin buccal bone plate, high aesthetic demands, and risk of soft tissue recession require careful planning and precise surgical technique. To mitigate the risk of ridge resorption and to enhance peri-implant tissue stability, bone grafting is often employed, particularly in cases where a gap exists between the implant and the socket walls.

This case report describes the immediate placement of a dental implant in the anterior

maxilla following atraumatic tooth extraction, combined with bone grafting to support the buccal contour and enhance aesthetic outcomes.

Case Report:

A 28-year-old male patient reported to the Department of Prosthodontics and Crown & Bridge with a chief complaint of a fractured upper front tooth numbered 21 with the desire for a fixed replacement. The patient was systemically healthy, a non-smoker, and had no significant medical history. Clinical and radiographic examinations revealed a non-restorable fracture of tooth 21 with intact surrounding soft tissue and adequate alveolar bone volume and with no signs of infection or pathology at fractured site. (Fig. 1)

After a thorough discussion of the available treatment options, including the advantages and limitations of immediate implant placement, the patient consented to undergo extraction of tooth 21 followed by immediate implant placement and bone grafting.

Surgical Procedure:

Under local anesthesia, tooth 21 was atraumatically extracted using periotomes to preserve the integrity of the alveolar socket, particularly the buccal bone plate. (Fig. 2 and Fig. 3). The socket was carefully debrided and irrigated. A dental implant with dimension of 4.2 mm × 13 mm titanium implant (Norris) was placed in a palatal position within the socket to achieve optimal primary stability and a prosthetically driven position. (Fig. 4 and Fig. 5). An insertion torque of 35 Ncm was achieved, confirming satisfactory primary stability. A gap of 2 mm was noted between the buccal aspect of the implant and the socket wall. To promote bone

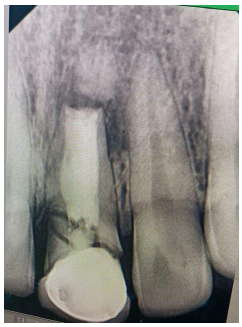

Figure 1. Fractured Tooth numbered 21

Figure 2: Extracted Tooth Numbered 21

Figure 3: Measurement of Apical Part of Extracted tooth

Figure 4: Placement of implant (4.2×13mm)

Figure 5: Implant Placement (4.2×13 mm)

Figure 6: Bone Graft

Figure 7: Sutured Post Operative Site

Figure 8: Osseo integrated implant after 3 months

regeneration and preserve the ridge contour, the gap was filled with a bone graft (Nova bone). A healing abutment was placed, and the site was sutured with 4-0 resorbable sutures. (Fig. 6 and Fig. 7) The patient was prescribed antibiotics and analgesics and advised to follow standard postoperative care instructions. Follow-up evaluations at 1 week, 1 month, and 3 months showed uneventful healing with no signs of infection or soft tissue complications. At 3 months post-placement, radiographic evaluate on showed good integration of the implant and evidence of bone fill around the grafted area. (Fig. 8 and Fig. 9)

After confirming successful osseointegration, a Cement-retained provisional crown was delivered to guide the soft tissue healing and shape the emergence profile. The patient was monitored for an additional 6 weeks, during which excellent soft tissue adaptation and aesthetic outcomes were observed. Subsequently, a definitive zirconia crown was fabricated and delivered. The final prosthesis demonstrated excellent shade matching and harmonious integration with adjacent teeth. (Fig.10, Fig.11 and Fig.12)

Discussion

Immediate implant placement is indicated in cases of tooth extraction due to trauma, root fracture, root perforation, root resorption, unfavourable crown: root ratio and with no dehiscence or fenestration defect[1] Contraindications include site with active infection, insufficient bone apical to tooth socket apex (<3mm) and wide or long gingival recession[2]. In general, approximately 5% of implants are expected to be lost regardless the protocol being used. The success rate in maxilla has been stated as 66-95.5% and in mandible is 90–100%[4]. No statistically significant differences in mean crestal bone loss and mean probing pocket depth between the protocols was found. Immediate implant placement was initially said to preserve alveolar bone. However this is said to be controversial since morphologic changes of the post-extraction site may occur despite immediate / early implant placement. Buccal wall of socket being thin, slightly palatal/ lingual placement of the implant in the extraction socket is recommended to avoid exposure of the implant surface. And also for preservation of bone, careful extraction is recommendable and it is advised to section multi-rooted teeth before removal[3]. Controversies exist on whether local pathology has an adverse effect on the outcome. Chronic infection is not an absolute contraindication for immediately placed implants, however, thorough debridement of the alveolus should be made. The use of antibiotics prophylactically, is recommended in medically compromised patients. In the present study no local pathology was present[3]. Small gaps between implant surface and socket wall have a potential for spontaneous healing. GBR and

Figure 9: Healed soft tissue after 3 months

Figure 10,11,12: Closed tray impression technique followed by placement of a 15-degree angulated abutment and definitive zirconia prosthesis.

grafting perform successfully for augmentation of dehiscences and fenestrations; however, no evidence exists that one technique or material is superior to others. In the present study, no osseous defect had warranted the use of any graft material[5].

Conclusion

Immediate implant placement in the aesthetic zone offers significant advantages, including reduced treatment time, preservation of alveolar bone, and maintenance of soft tissue contours. However, its success depends on careful case selection, atraumatic extraction, proper implant positioning, and appropriate use of grafting materials when needed. In the present case, the use of a bone graft in conjunction with immediate implant placement contributed to the preservation of the buccal contour and supported an optimal aesthetic outcome. The clinical and radiographic results observed during follow-up indicate that, when executed with precision, immediate implant placement with adjunctive grafting can be a predictable and effective treatment modality for replacing teeth in the anterior maxilla. Continued follow-up is essential to monitor long-term stability and ensure sustained aesthetic and functional success.

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