

**Case Report**

**IMMEDIATE IMPLANT PLACEMENT WITH ONE YEAR FOLLOW-UP:  
A CASE REPORT**

**Abdulgani Azzaldeen<sup>1</sup>, Bajali Musa<sup>1</sup> and \*Abu-Hussein Muhamad<sup>2</sup>**

<sup>1</sup>*AlQuds University, Jerusalem, Palestine*

<sup>2</sup>*Napoli University, Athens, Greece*

*\*Author for Correspondence*

**ABSTRACT**

This case report describes extraction of a fractured left maxillary central incisor tooth, followed by immediate placement of a dental implant in the prepared socket and temporization by a bonded restoration. The tooth was extracted with minimal hard and soft tissue trauma and without flap reflection. The socket was prepared to the required depth and a biohorizon Implant was inserted. An impression was made 4 months after implant insertion, and a definitive restoration was placed. The atraumatic operating technique and the immediate insertion of the Implant resulted in the preservation of the hard and soft tissues at the extraction site. The patient exhibited no clinical or radiologic complications through 12 months of clinical monitoring after loading. The dental implant and provisional restoration provided the patient with immediate esthetics, function, comfort and most importantly preservation of tissues.

**Key Words:** *Implant, Immediate Placement, Temporization*

**INTRODUCTION**

Immediate implants are defined as the placement of implants in course of surgical extraction of the teeth to be replaced. The insertion of implants immediately after extraction is not new, and in the 1980s, the University of Tübingen advocated the procedure as the technique of choice for Tübingen and München ceramic implants (Wagenberg and Ginsburg, 2001; Cooper *et al.*, 2002). As a result of the success of the protocol designed by Brånemark and his team for their dental implant system, other procedures were largely relegated for many years. Initially, a healing period of 9-12 months was advised between tooth extraction and implant placement. Nevertheless, as a result of continued research, a number of the concepts contained in the Brånemark protocol and previously regarded as axiomatic; such as the submerged technique concept, delayed loading, machined titanium surface, etc.; have since been revised and improved upon even by actual creators of the procedure (Cooper *et al.*, 2002; Di-Felice *et al.*, 2011; Gelb, 1999). Based on the time elapsed between extraction and implantation, the following classification has been established relating the receptor zone to the required therapeutic approach:

- a. Immediate implantation, when the remnant bone suffices to ensure primary stability of the implant, which is inserted in the course of surgical extraction of the tooth to be replaced (primary immediate implants)
- b. Recent implantation, when approximately 6-8 weeks have elapsed from extraction to implantation, a time during which the soft tissues heal, allowing adequate mucogingival covering of the alveolus (secondary immediate implants)
- c. Delayed implantation, when the receptor zone is not optimum for either immediate or recent implantation. Bone promotion is first carried out with bone grafts and/or barrier membranes, followed approximately 6 months later by implant positioning (delayed implants)
- d. Mature implantation, when over 9 months have elapsed from extraction to implantation. Mature bone is found in such situations (Di-Felice *et al.*, 2011; Gelb, 1999; Barone *et al.*, 2006; Zabalegui *et al.*, 2002).

The most frequently cited reasons for underutilization of endosseous implant therapy are that treatment cost is perceived to be too high and treatment takes too long (Brånemark's original treatment protocols required up to a year or more to complete treatment) An obvious area of focus has been to decrease the

### **Case Report**

amount of time necessary to complete implant therapy. Approaches to achieve this goal have dominated clinical research and practice: delayed/immediate implant loading, improving implant surface technology (promotion of quicker healing and better osseointegration), and immediate placement of an endosseous implant after extraction of a natural tooth (Wagenberg and Ginsburg, 2001). In this paper a case presentation supporting the last of these three approaches will be shown. The definition for an immediate endosseous implant is extraction of a natural tooth followed by immediate placement (within the same surgical procedure) of an endosseous dental implant. Immediate implants have become widely accepted despite controversial beginnings and the available literature consistently cites high levels of success (ranging from 94-100% on average), immediate implants provide clinically recognizable benefits. Broadly speaking, these benefits include reduction of morbidity, reduction of alveolar bone resorption (Controlled clinical studies have demonstrated an average of 4.4mm of horizontal and 1.2mm of vertical bone resorption six months after tooth extraction preservation of gingival tissues, preservation of the papilla in the esthetic zone, and reduction of treatment cost and time (the healing phase is shorter in general and there is a reduction in the number of procedures) (Wagenberg and Ginsburg, 2001; Cooper *et al.*, 2002; Di-Felice *et al.*, 2011; Gelb, 1999; Barone *et al.*, 2006). With the extraction socket as a guide, the surgeon can also more easily determine the appropriate parallelism and alignment relative to the adjacent and opposing residual dentition. To maximize the advantage of these benefits and to minimize implant failure, case selection must be based on sound clinical and research criteria. Immediate placement and provisionalisation for single tooth replacement allows for minimal disruption of the marginal soft tissues, providing immediate prosthetic support for the peri-implant tissues through the use of a carefully crafted provisional restoration. Primary implantation is fundamentally indicated for replacing teeth with pathologies not amenable to treatment, such as caries or fractures. Immediate implants are also indicated simultaneous to the removal of impacted canines (Barone *et al.*, 2006; Hoffmann *et al.*, 2006). Immediate implantation can be carried out on extracting teeth with chronic apical lesions which are not likely to improve with endodontic treatment and apical surgery (Zabalegui *et al.*, 2002). The surgical requirements for immediate implantation include extraction with the least trauma possible, preservation of the extraction socket walls and thorough alveolar curettage to eliminate all pathological material. Primary stability is an essential requirement, and is achieved with an implant exceeding the alveolar apex by 3-5 mm, or by placing an implant of greater diameter than the remnant alveolus. Esthetic emergence in the anterior zone is achieved by 1-3 mm sub-crest implantation (Hoffmann *et al.*, 2006; Zabalegui *et al.*, 2002).

### **Contraindications**

The existence of an acute periapical inflammatory process constitutes an absolute contraindication to immediate implantation (Romanos, 2003; Novaes-Junior and Novaes, 1995).

In the case of socket-implant diameter discrepancies in excess of 5 mm, which would leave most of the implant without bone contact, prior bone regeneration and delayed implantation may be considered (Anitua and Orive, 2012). Avoid teeth with large or acute periapical infection; Teeth with labial bony dehiscence or fenestration defects; Insufficient bone apically to ensure primary stability of the implant; Systemic factors that may impair healing (e.g. smoking); Large bulbous root morphology, Interproximal bone loss (aesthetic zone), active periodontitis (Strub *et al.*, 1997).

### **CASES**

A 53-year-old male patient presented with a history of trauma and crown fracture at the cervical area of tooth 11 (figure 1, 2, 3) and requested an immediate solution. Clinical and radiological evaluation revealed adequate alveolar bone, absence of periapical pathology but fracture line was below the crest of alveolar bone and was limited to the tooth. So, it was decided to extract and place endosseous implant immediately and place a provisional restoration to avail the benefits like preservation of bone and emergence profile.

### **Case Report**

After administering appropriate antibiotic and analgesic, induction of local anaesthesia was carried out using lignocaine with adrenaline. As preservation of alveolar bone is key to success of immediate implants, extraction of tooth has to be atraumatic, so using periostomes and small periosteal elevators the fragment was luxated without excessive enlargement of the socket, and using an innovative method where endodontic file was used to engage the canal wall and tooth fragment was slowly luxated and pulled out of the socket using the file (figure 4, 5).

The sockets were debrided with curettes and a BIOHORIZON implant was planned (4 x 12mm). The drilling sequence was carried out without reflecting the flap to preserve the bone.

After checking for primary stability, which was achieved by wrenching the implant into the bone beyond the apex of the socket, alloplast – BIO-OSS was packed between the implant and labial socket wall. The cover screw was placed and interrupted sutures were placed. IOPA was taken to see the implant placement (figure 6,7). It was found to be satisfactory. Post operative instructions were given to the patient, and were asked to report after 1 week. The sutures were removed after 7 days and the patient received temporary acrylic crown bonded to the adjacent teeth with fibre-reinforced composite on the same day.



**Figure 1: Initial retracted**



**Figure 2: Initial occlusal**

**Case Report**

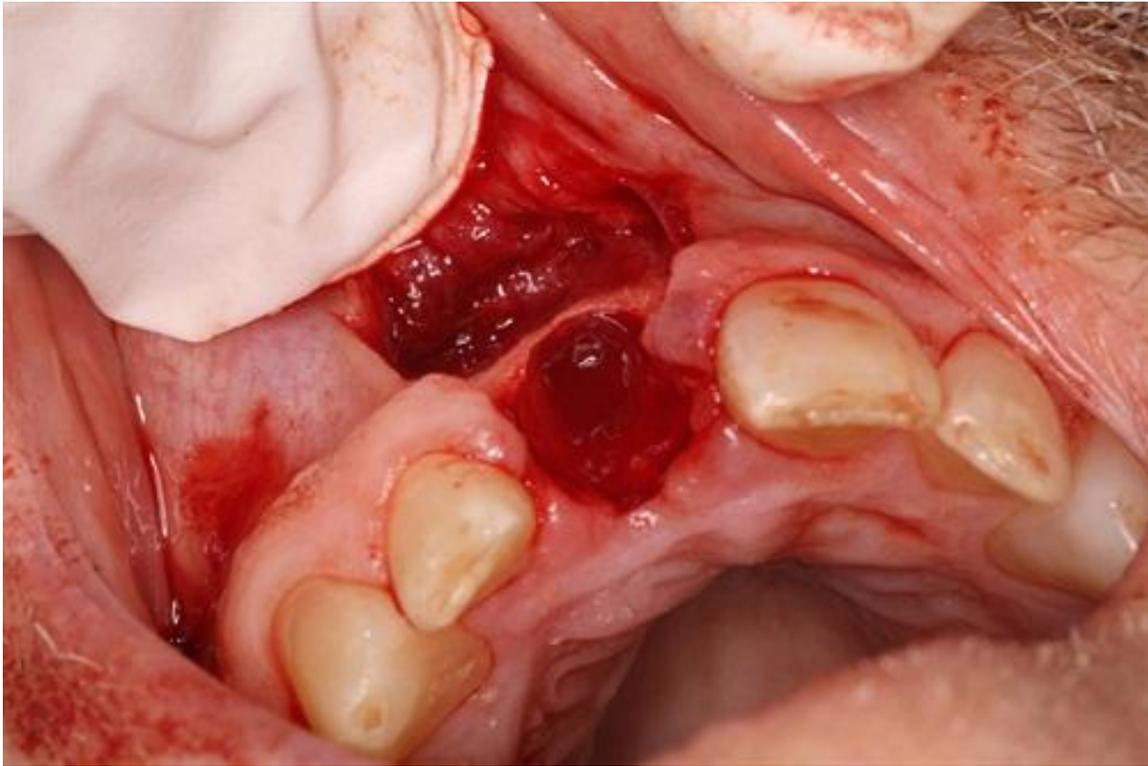


**Figure 3: Initial xray**



**Figure 4: Coronal portion of tooth removed**

**Case Report**

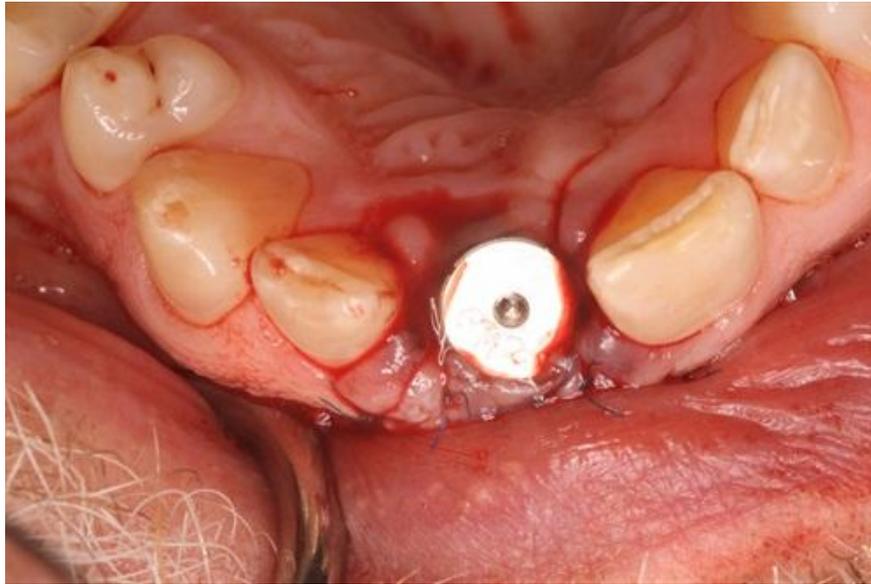


**Figure 5: Tooth removed atraumatically, the facial plate was very thin**

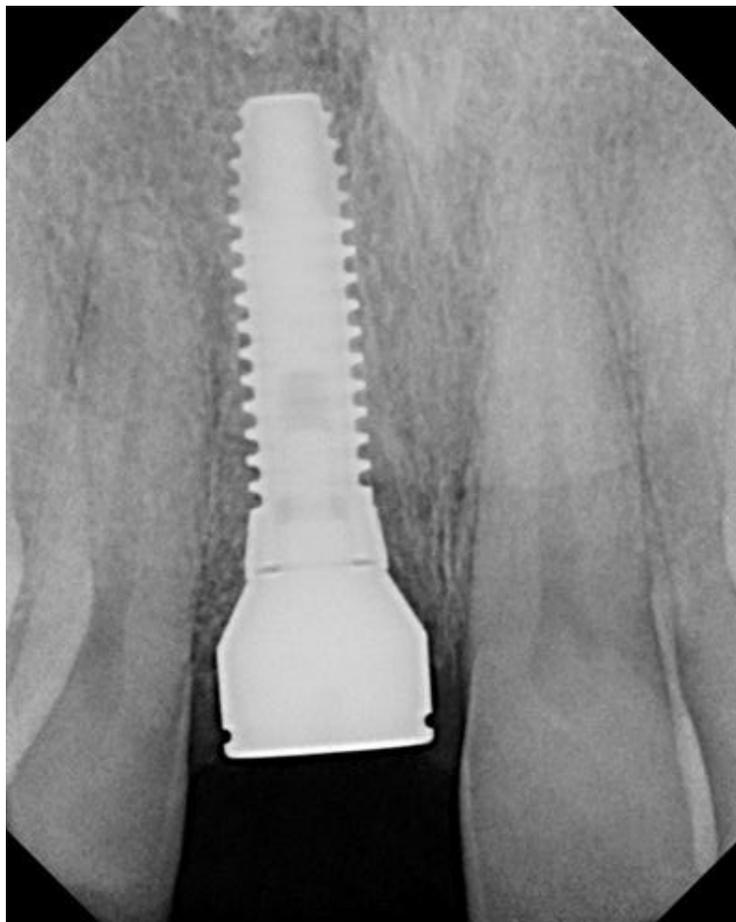


**Figure 6: Immediate post op**

**Case Report**



**Figure 7: Immediate post op**



**Figure 8: X-ray of immediate implant 4X12 Biohorizons internal hex**

**Case Report**



**Figure 9: Stock abutment**



**Figure 10: Final crown retracted view**

**Case Report**



**Figure 11: Occlusal view of final crown**



**Figure 12: Final 12 months**

The patient was recalled after four months for the prosthetic procedures and was given porcelain fused to metal crown over the implant. He was recalled for prophylaxis and follow up every three months. The clinical and radiographic appearances at six months and after one year show good aesthetic result and acceptable osseo-integration of the implant (figure 8, 9, 10, 11, 12).

## **Case Report**

### **CONCLUSION**

The implant therapy must fulfill both functional and esthetic requirements to be considered a primary treatment modality. Aiming to reduce the process of alveolar bone resorption and treatment time, the immediate placement of endosseous implants into extraction sockets achieved high success rate of between 94-100%, compared to the delayed placement.

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