

Extraction and Immediate Implant Placement, and Provisionalization with two Years Follow-up: A Case Report.

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Case Report

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ABSTRACT

This case report describes extraction of a fractured right 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 Straumann 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 two years 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.

INTRODUCTION

Endosseous dental implant therapy is rapidly becoming the prosthetic standard of care for a vast array of clinical applications, however, despite the high success rate of endosseous implant therapy, it has yet to achieve wide public acceptance and utilization [1]. Endosseous implant therapy in the mandible (parasymphiseal mandible) has repeatedly been reported at a success rate of 95% or better, yet public utilization of endosseous implant therapy has not exceeded 5%. 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 (Branemark's original treatment protocols required up to a year or more to complete treatment) An obvious area of focus has been to decrease the 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 [1]. 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 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 [1, 2], preservation of gingival tissues, preservation of the papilla in the esthetic zone, and reduction of treatment cost and time [1,2,3,4,5]. 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 [5,6]. 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 [7].

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.

The existence of an acute periapical inflammatory process constitutes an absolute contraindication to immediate implantation [8,9]. 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 [10]. 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.

Case Report

A 45-year-old male patient presented with a history of trauma and crown fracture at the cervical area of tooth 11 (Fig 1,2) 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.



Figure 1



Figure 2

After administering appropriate antibiotic and analgesic, induction of local anaesthesia was carried out using xylocaime 2%with adrenaline1;200,000. As preservation of alveolar bone is key to success of immediate implants, extraction of tooth has to be atraumatic, so using periotomes 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 (Fig 3, 4).



Figure 3



Figure 4

The sockets were debrided with curettes and a Straumann implant was planned (4.1x 14mm). The drilling sequence was carried out without reflecting the flap to preserve the bone. After checking for primary stability (Fig 5,6), 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 (Fig 7, 8, 9, 10,11). It was found to be satisfactory. Post operative instructions were given to the patient, and was 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 (Fig 12). 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 (Fig 13,14,15).



Figure 5



Figure 6

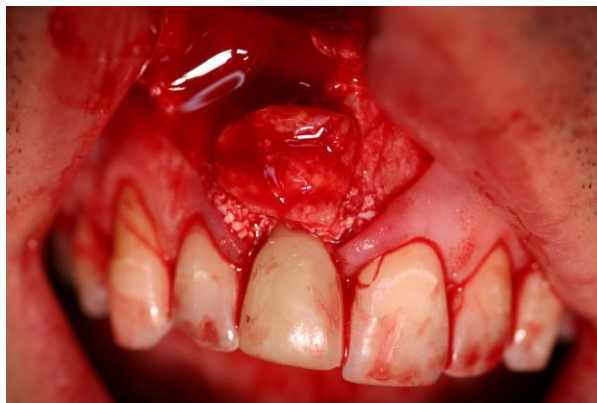


Figure 7



Figure 8



Figure 9



Figure 10



Figure 11



Figure 12



Figure 13



Figure 14



Figure 15

DISCUSSION

Implant placement subsequent to tooth extraction in conjunction with the use of provisionals in the anterior maxillary region is certainly challenging for the dental practitioner. However, this treatment modality offers several advantages, including reduced clinical time, a single local anaesthetic injection, a flapless procedure and immediate placement of the implants. From the patient's point of view, the immediate incorporation of a fixed implant-supported provisional restoration is very acceptable and even requested. With the clinical procedure described here, both dentist and patient can evaluate the aesthetics of the restoration. Soft-tissue support is enhanced and achievement of the desired result is facilitated. With initial implant stability, proper tissue management and correct use of the available implant components, a predictable aesthetic result can be produced. On the other hand, occlusal control, oral hygiene and a regular recall programme should be considered prerequisites for maintaining a long-lasting restoration.

Single-tooth implants have shown high success rates in both the anterior and the posterior regions of the maxilla and the mandible.¹⁻⁴ Immediate postextraction implant placement has been done since the early years of the clinical application of implants with very good clinical outcomes.⁵⁻⁸ Decisive factors for immediate implant placement are lack of infection in the periodontal tissues and an intact tooth socket. Immediate incorporation of a temporary restoration has been presented in the literature with most encouraging results.⁷⁻¹⁴ Although clinical experiences have advocated this clinical technique for many years, more extended longterm clinical studies are necessary to prove the efficacy of the method and establish a stable clinical protocol.

CONCLUSION

This case report describes a technique to preserve and augment anterior aesthetics by combining a traumatic teeth extraction, hard and soft tissue augmentation, immediate provisionalization and using the platform switching concept to preserve the buccal plate. The gingival tissue surrounding the implants has remained stable with no recession two years following final crowns placement (Fig 14).

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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