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Immediate Implant Following Tooth Extraction- A Case Series

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Abstract
This article describe about the case reports of immediate placement of implant in freshly extraction socket incorporation with bone graft promoting healing and overcoming the problem of jumping distance >1mm. The teeth were a traumatically extracted, the socket was prepared to the required depth and a Global Implant was inserted. An impression was made 3- 4 months after implant insertion, and a definitive restoration was placed. The traumatic operating technique and the immediate insertion of the Implant with bone graft resulted in the preservation of the hard and soft tissues at the extraction site. The immediate dental implant placement provides the patient with immediate aesthetics, function, comfort, and most importantly preservation of tissues with good alveolar ridge height.
Keywords: *Dental implants, immediate placement, Ridge preservation, Socket preservation.*

Introduction

Recent advances in clinical techniques and biomaterials have raised the graph of indications of dental implant treatment options.

Replacing teeth by using dental implants has proven to be a successful and predictable treatment procedure; different placement and loading protocols have evolved from the first protocols in order to achieve fast and easier surgical treatment methods. It has been 30 years that the immediate placement of a dental implant in an extraction socket came to the treatment protocol, as described by Schulte and Heimke (1976)[(1,2)].

Reductions in the number of surgical interventions, an ideal three dimensional implant positioning, a shorter treatment time, the preservation of alveolar bone at the side of the tooth extraction and soft tissue aesthetics have been claimed as the potential advantages of this treatment approach [(3)].

On the other hand, the morphology of the site, the absence of keratinized tissue, the presence of periapical pathology, thin tissue biotype and lack of complete soft tissue closure over the extraction socket have been reported to adversely affect in immediately placed implants [(3)]

The first classification describe about the timing of implant placement as mature, recent, delayed or

immediate which is depending on soft tissue healing and predictability of Guided Bone Regeneration (GBR) procedures, however further classifications are based on hard and soft tissue healing and treatment, time approach were subsequently described, as shown in (Table 1) [4,5]

Author / Year	Classification	Implant placement
Hämmerle et al. (2004)	Type I	In fresh extraction sockets
	Type II	After soft tissue coverage (4- 8 weeks)
	Type III	Radiographic bone fill (12-16 weeks)
	Type IV	Healed socket (>16 weeks)
Esposito et al. (2006)	Type I	In fresh extraction sockets
	Type II	< 8 weeks post extraction
	Type III	> 8 weeks post extraction

The efficacy of GBR therapy involves autogenous and non-autogenous particulate materials in combination with various membranes to regenerate alveolar bone at the time of tooth extraction had also been demonstrated. Concomitant placement of regenerative materials has been shown to result in predictable and desirable, high level of osseointegration is appreciated [6].

This study will focus on the review of the current literature on immediate implant placement, in order to understand wound healing of extraction site, crestal bone loss, as well as several treatment features that affect soft tissue response and biological bone as compared to the delayed place-ment protocol.

The purpose of this review is to answer the following questions:

- Are there are significant differences in crestal bone resorption between immediate and delayed implants? Where?
- Do immediate implants have a significant effect on soft tissue recession outcomes as compared to delayed implants?
- Does the presence or absence of Periapical infection have any effect on the immediate implant success and survival rate?
- Does the gap treatment minimize the crestal bone loss?
- Are there any significant differences observed in implant stability between immediate and delayed implants?

Objectives

To study the outcome of implant placement in fresh extraction sockets followed by particulate bone graft material with immediate implants, their favourable and unfavourable results, and the indications and contraindications of immediate implant clinically.

Material and Methods

Patients referred to maxillofacial surgery department for extraction and implant therapy were included in the study. A consecutive series of patients indicated for immediate implant placement in fresh extracted socket were subjected to surgery. Patients with systemic complication or co morbid diseases were not included.

The space between socket and implant was filled with a material called autologous bone graft. A two-stage surgical procedure was planned to optimize healing of marginal bone. All patients were to be followed clinically and radio graphically for 18 months according to a standard protocol.

Case Reports

Case 1

A 50 year old male patient come to the department of oral and maxillofacial surgery with the complaint of pain in previously treated tooth in lower left back tooth region since month. The clinical as well as radiographic examination of tooth reveals a failed root canal treated tooth with furcation involvement (Fig:1a). The investigation indicates the tooth for extraction followed by prosthetic rehabilitation. For patient the rehabilitation was utmost important and immediate requirement, so we decided to go for an immediate implant following extraction after radiographic examination revealing adequate

alveolar bone, absence of periapical pathology. 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 had been atraumatic, so using periotomes and small periosteal elevators, the fragment was luxated without excessive enlargement of the socket (Fig:1b). The socket were debrided with curettes two implant of diameter 4.2 mm with length 10mm.Third implant of 3.0 mm diameter length of 11.5mm. The cover screw was placed and closure was done with interrupted sutures. Post operative OPG was taken (Fig:1c) for evaluation followed by post operative instructions for patient, and was asked to report after 1 week. The sutures were removed after 7 days. The patient was recalled after 4 months for the prosthesis and was given porcelain fused with metal crown over the implant. The patient was asked to come every year for prophylaxis and follow up.

Aiming to eliminate the process of alveolar bone resorption and to reduce treatment time, the immediate placement of implants into extraction sockets is the best way to achieve a high success rate of between 94 and 100 %, as compared to the delayed placement.

Fig:1a Pre-operated OPG

Fig:1b Freshly Extraction Socket

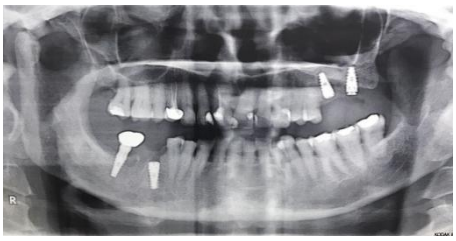

Fig1:c Post-operated OPG

Case-2

Patient comes to the department with the complaint of decayed tooth in lower right back tooth region. The clinical and radiographic examination reveals grossly decayed tooth. So, the treatment plan was to extract that tooth followed by an immediate placement of implant for complete rehabilitation as early as possible. After evaluation of patient's clinical signs and symptoms with vitals examination the tooth was carefully extracted a traumatically in a complete aseptic condition (Fig:2a) followed by immediate implant placement of size diameter 3.75mm length of 13mm in freshly extraction socket (Fig:2a). The cover screw was placed and closure of site was done with mersilk 4-0 and the patient was recalled after 1 week for follow up. Post operative instruction was given to patient and was explained about the prosthesis placement after 4 months.

Fig:2a Freshly Extraction Socket

Fig:2b Implant placed

Case-3

A 35 year old male patient reported to department of Oral and Maxillofacial surgery with the complaint of broken and missing teeth in upper front tooth region. The clinical and radiographic examination reveals a long span edentulous area in relation to maxillary anteriors crossing midline with fractured crown en mass of maxillary left canine. The patient seeks treatment for his aesthetic area and the edentulous area is wide with class IV kennedy's classification that involves both the cuspids, the treatment plan was to extract the root stump of maxillary right canine followed by immediate implant placement. Atraumatic extraction was done in complete aseptic condition and an immediate implant of 3.5 mm × 10 mm (Fig:3).

Fig:3 Implant with Cover Slip

Results

5 implants were placed in fresh extraction sockets in 3 patients with an average age of 46 years. In most cases posterior mandible was preferred site for implant placement. To fill the space between the implant and the socket borders Autologous bone graft material was used. In one case we had done direct sinus lift with autogenous bone graft. At the time of abutment connection all implants were osseointegrated. No complications were observed. Radiographic examination showed only minimal marginal bone loss of 0.13 mm on mesial and 0.19 mm on distal. After satisfactory healing occurs, loading can be done after 3 months of time period.

Conclusion

Implants can be placed successfully in fresh extraction sockets using autologous bone graft material to fill the gap between implant and labial bone with a help of submerged surgical technique.

Discussion: Immediate implants have appreciable results with several advantages over delayed implant placement. Although, technical complications have been described regarding this technique. Also use of biomaterials will give more favourable results when the jumping distance is greater than 1mm or in case of presence of bone defect.

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