

Immediate Implant Placement Following Extraction with Autogenous Bone Grafts - A Case Report

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The placement of a dental implant in an extraction socket at the time of extraction or explantation is known as immediate implant placement. The protocol of placing implants was into the healed teeth sockets until 1989 when Lazzara placed implants at the time of tooth extraction in the tooth socket. In the past few years numerous studies showed that immediate implant placement after tooth extraction is a an acceptable, predictable and reliable treatment protocol. Several bone grafts have been used to minimise the bony defects surrounding immediately placed implants. Autogenous bone grafts obtained from patients' own body have osteoinductive potential which helps to induce the pluripotential cells to differentiate into osteoblasts for further regeneration of bone. The advantages of autograft bone material also includes that it maintains bone structures such as minerals, collagen and viable osteoblasts and bone morphogenic proteins (BMPs). In this article a case has been reported in which complete extraction was carried out under local anaesthesia followed by immediate implant placement with autogenous bone grafts.

Key words: Bone grafts, Dental implant.

Implant by definition “means any object or material, such as an alloplastic substance or other tissue, which is partial or completely inserted into the body for therapeutic, diagnostic, prosthetic, or experimental purpose. The placement of a dental implant in an extraction socket at the time of extraction or explantation is known as immediate implant placement. The extraction can be due to caries, periodontally compromised tooth, infection, trauma. Immediate placement of oral implants has been reported as a beneficial treatment protocol in implant dentistry that increases the comfort of the patient. In 1965

Branemark placed the first endosteal titanium implant successfully into healed tooth socket. The protocol of placing implants was into the healed teeth sockets until 1989 when Lazzara placed implants at the time of tooth extraction. In the past few years numerous studies showed that immediate implant placement after tooth extraction is a an acceptable, predictable and reliable treatment protocol. The greatest advantage being minimal requirement of using bone drills since the extracted tooth socket is already in the shape of the tooth root and hence needs minimal preparation for the root form endosteal implants except using the drills apically to increase the length for better initial stability of the implants. Hence reduced trauma to bone prevents bone necrosis and promotes better and faster osteogenetic remodelling around the implant with an added advantage of the presence

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of periodontal cells and matrix which aids in the remodelling procedure. Autogenous bone grafts obtained from edentulous ridges or interdental bone or other donor sites of the jaw can be used to fill in the small osseous defects. Even marginal bone loss is lesser in immediate implant placement than the delayed ones. Last but not the least patient need not wait few months for their teeth to be restored. In this case report a patient with chronic generalised periodontitis full mouth extraction was done followed by immediate implant placement with autogenous bone grafts.

Case report

A patient was diagnosed with chronic generalised periodontitis which was confirmed clinically and radiographically. Full mouth extraction was needed followed by full mouth rehabilitation. Under LA (1:200000) with adrenaline full mouth extraction was done followed by immediate implant placement in single sitting. Totally 12 implants were placed in the maxillary and the mandibular arch with 6 implants in each arch. Autogenous bone grafts were obtained from the interradicular septum, interdental bone and from the buccal cortical plate by using chisel and mallet. The obtained bone grafts were placed in the area surrounding the immediate implants. The wound closure was done with 3-0 silk sutures. Immediate complete denture was prepared for the patient for temporary use. 100th day postoperative healing was found to be excellent with negligible amount of marginal bone loss.

DISCUSSION

One needs to know the indications and contraindications for immediate implant placement. Block and Kent, 1991 summarized⁽¹⁾ the indications as

- 1) Traumatic loss of teeth with a small amount of bone loss
- 2) Tooth lost because of gross decay without purulent exudates or cellulitis
- 3) Inability to complete endodontic therapy
- 4) Presence of severe periodontal bone loss without purulent exudates
- 5) dequate soft tissue health to obtain primary wound closure.

The contraindications are

- 1) Presence of purulent exudates at the time of

extraction

- 2) Adjacent soft tissue cellulitis and granulation tissue
- 3) Lack of an adequate bone apical to the socket
- 4) Adverse location of the mandibular neurovascular bundle, maxillary sinus and nasal cavity
- 5) Poor anatomical configuration of remaining bone.

Literature reveals that the stages of extraction socket wound healing involves the osteophyllic, osteoconductive and the osteoadaptive stages. The maximum blood supply for the cortical bone is from from the periosteal blood supply. Misch and Judy,2000 found out that if the buccal or facial cortical plate is lost during extraction it leads to reduced bone height and thickness for implant placement after the socket heals. Khalid S. Hassan and Adel S. Alagl , 2011 summed up that following an extraction, there is a 25% decrease in the width of the alveolar bone during the first year, and an average 4mm decrease in height during the first year following multiple extractions (Carlson & Persson,1967) and Misch (1999) have observed a 40%-60% decrease in alveolar bone width after the first two to three years post extraction, and Christensen (1996) reports an annual resorption rate of at least 0.5% to 1% during the remainder for the rest of a Patient's life.⁽²⁾ Several studies revealed that immediate implant placement after tooth extraction helped preserving the alveolar bone height and width with reduced marginal bone loss³.

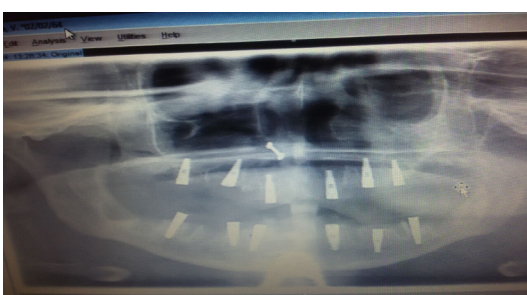
Autografts are obtained from the patient's own body. In case of autogenous bone grafts for immediate implants the donor sites can be maxillary tuberosity, mandibular symphysis region, ramus of mandible and interdental, interradicular bone. The autogenous bone grafts being the natural bone grafts of the patients own body they have both osteogenic and osteoinductive potential. While the osteogenic potential of the autogenous bone grafts help new bone regeneration from the osteoblasts the osteoinductive potential helps to induce the pluripotential cells to differentiate into osteoblasts for further regeneration of bone. The advantages of autograft bone material also includes that it maintains bone structures such as minerals, collagen and viable osteoblasts and bone morphogenic proteins (BMPs). Hassan et al.,



Preoperative



Immediate postoperative

100th day postoperative

2008 demonstrated a comparative evaluation of immediate dental implant with autogenous versus synthetic guided bone regeneration. It was found out that autogenous bone grafts are further more superior in comparison to the synthetic bone grafts⁴. The combination of autogenous and synthetic bone grafts have also been tried.⁽⁵⁾ Other studies with immediate implant placement followed by autogenous bone grafts showed excellent results of minimal or no bone loss at the time of loading of the implants^{11,12,13}.

The main advantage noticed in the immediate placement is that the patient need not wait for 4-6 months for the treatment to be started. The another main advantage is that the marginal

bone loss in immediate implant placement in the extraction socket⁶. Several clinical studies and trials have evaluated the effectiveness of the immediate implant placement of the implants⁷⁻¹⁰.

CONCLUSION

In this case autogenous bone grafts are used taken from patient's buccal cortical plate, interdental and interradicular septum and packed in the areas surrounding the immediate implants. Postoperative healing was excellent and no crestal bone loss was found. Hence it can be concluded that immediate implant placement with autogenous bone grafts are most advantageous rather than delayed implant placement.

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