Immediate Implant Placement in Fresh Extraction Site: A Case Report

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Abstracts: Successful placement of dental implant into fresh extraction socket in single rooted tooth region has been reported. In cases of immediate implant placement in the single rooted tooth, initial primary stability is important to achieve predictable outcome. It is also suggested that the implant should be placed into minimum of 3 mm of solid bone apical to extraction site. The single stage approach preserves site morphology by protecting and supporting existing hard and soft tissues. Clinical success appears to be attributed to several important features of the technique which will be discussed in this case report. In the case presented, clinical and radiographic findings after implant placement confirmed a satisfactory treatment result. [Patil K NJIRM 2014; 5(6):113-119]

Key Words: Immediate implant placement, fresh extraction sockets, atraumatic extraction, primary stability, osseointegration.

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Introduction: Traditionally, before placing dental implants, the compromised teeth are removed and the extraction sockets are left to heal from several months upto 1 year.[1] The classic protocol for the treatment with osseointegrated implants recommended 6 to 8 months between tooth extraction and implantation.[2,3] Shropp et al. (2003)4 reported that upto 50 % horizontal reduction of 5 – 7 mm bone was observed during the first year following single tooth extractions.

This long waiting period is associated with an unavoidable bone loss that occurs after tooth extraction, which may lead to difficulties such as insufficient bone at the time of implantation. The insufficient bone leads to the use of angulated implants or the need of bone grafting procedures, increasing the morbidity, the treatment chair time and costs. Immediate implant placement has both social and economic advantages. The overall treatment time is reduced, a second surgical intervention is avoided, and there is a decrease in rehabilitation treatment time, 5 because it minimizes the number of surgical procedures by combining extraction, implant placement, and bone grafting (if needed) into one appointment.[6] Less evident advantages comprise improved implant survival rates, enhanced hard and soft tissue maintenance, and there is the ability to place the fixture in an ideal axial position.[7] At first, the main concern was with bone quality and with the length and width of the site of implantation. With the advances on guided bone regeneration and grafting procedures, most of the problems related to the amount of bone has been solved or mostly solved. Now the focus is mainly on aesthetics and amount of soft tissue increase or stability. [2,3]

Immediate implantation has gained attention in order to avoid problems related to the time lag between extraction and implant placement. To preserve the alveolar bone level from the collapse caused by healing and to reduce treatment time in situations in which tooth extraction precedes implant placement, it is sometimes advisable to install the implant immediately into the post-extraction socket, without waiting for the site to heal. The technique was first described at 1976 and since then has been the subject of scientific discussions.[8]

Lazzara (1989)[9] first reported immediate implant placement in an extraction socket in humans. Since then, this treatment modality has received much attention in the literature.

However, immediate implants into fresh extraction sockets exhibiting periapical infection or pathology is a matter of debate. Since immediate implants

placed in a socket with infection could contaminate and compromise the osseointegration process, many authors have suggested that the immediate Implant placement into a socket with the presence of infection would be contraindicated.[10,11]

The current case report presents review some of the important clinical considerations when selecting patients for immediate implant placement, and to discuss the advantages and disadvantages of this mode of therapy.

Case Report: A 42-year-old female reported to the Department of Periodontics, Dr. D.Y. Patil Dental College & Hospital, Pune with the chief complaint of a decayed tooth in lower left back region since 6 months. Figure 1 shows clinical photograph and Figure 2 shows radiograph of 34 regions. Patient was explained about the prognosis of the tooth and the tooth was planned to be removed atraumatically and immediate implant with Biohorizon LaserLok Implant was planned to be placed in the fresh extraction socket.

After all due consent, all required pathological and radiographic investigations were done. Reports suggested normal bleeding time and clotting time along with serum calcium level and bone level. Diagnostic casts were made and articulated on semiadustable articulator. Antibiotics were adviced one day prior to surgery.

Under local anaesthesia, buccal and lingual mucoperiosteal flap was elevated after incision. The tooth 34 was extracted atraumatically using the periotome and large 40 No K file [Fig.3]. The length and width of the tooth were measured with caliper [Fig.4]. On evaluation the buccal plate was found to be intact. [Fig.5] we decided to place the 4.6mm x 15mm Biohorizon LaserLok Tapered Internal Implant. The implant drilling sequence was followed according to the manufacturer direction. The final drill was placed into the fresh extraction sockets to evaluate the final position of the implant. [Fig.6] 4.6mm x 15mm Biohorizon LaserLok Tapered Internal Implant [Fig.7] was placed into the osteotomy site. [Fig.8] Following the removal of the abutment, implant site was evaluated to determine the jumping distance. [Fig.9] The cover screw was placed and the surgical site was sutured with simple interrupted for better approximation. [Fig.10] Radiograph of the immediate implant placed in fresh extraction site was recorded. [Fig.11] Post operative instructions were given and patient was advised antibiotic and analgesics. The next day the patient was called for review. One week later the sutures were removed and the patient was called every month for checking the progress.

After a period of three months, radiographic confirmation of osseointegration was done radio graphically, the site was reopened and gingival former was placed by replacing the cover screw. The patient was then called after a period of two weeks. The soft tissue around the gingival formal was evaluated. A poly vinly siloxane impression was obtained and cast along with the implant analog and the abutment with ball top was poured. Shade selection was done and final prosthesis was then prepared. [Fig.12] The final prosthesis was then placed in the patient mouth. [Fig.13] After 1 year follow up, radiograph were recorded showing no crestal bone loss. [Fig.14]

Figure 1: Clinical Photograph Showing Decayed 34

Figure 2: Radiograph of 34 Regions

Figure 3: 34 Extracted Atraumatically

Figure 4: The Length and Width of the Tooth Being Measured With Caiper.

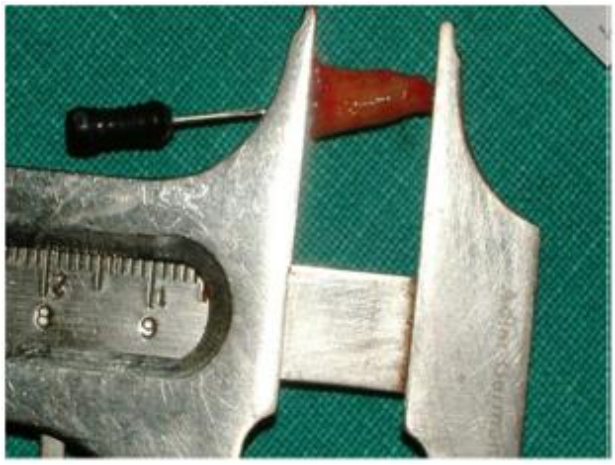

Figure 5: Intact Buccal Plate on Evaluation.

Figure 6: The Final Drill Placed Into Fresh Extraction Socket To Evaluate Final Position Of Implant.

Figure 7-a: 4.6mm X 15mm Biohorizon Laserlok Tapered Internal Implant

Figure 7-b: 4.6mm X 15mm Biohorizon Laserlok Tapered Internal Implant

Figure 8: Implant placed into the osteotomy site.

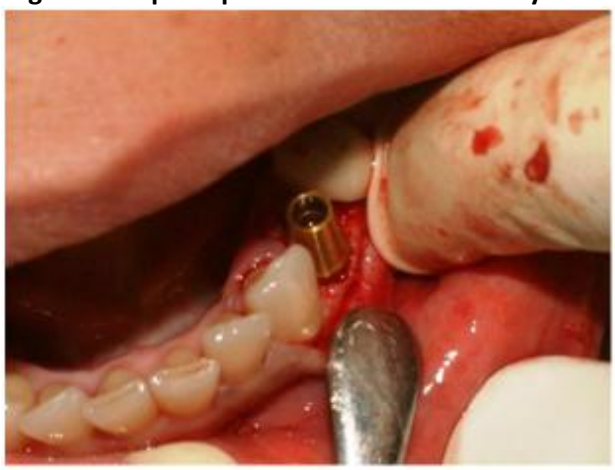

Figure 9: Removal of the Abutment.

Figure 10: The Cover Screw Placed And The Surgical Site Sutured With Simple Interrupted Method For Better Approximation.

Figure 11: Radiograph Of The Immediate Implant Placed In Fresh Extraction Site.

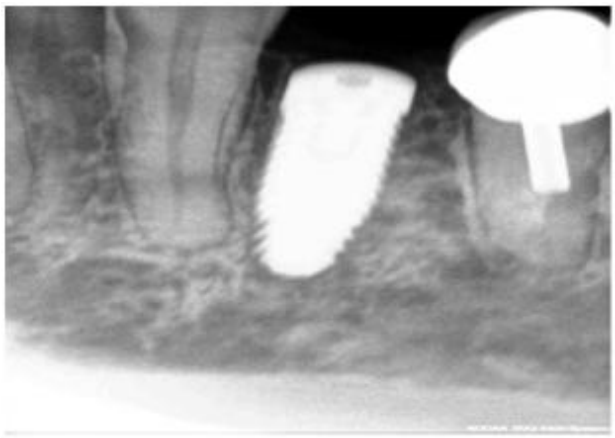

Figure 12: Before Final Prosthesis Crown Cementation.

Figure 13: After Final Prosthesis Cementation

Figure 14: Radiograph Of 34 Regions Post 1 Year Follow-Up.

Discussion: The need of alveolar preservation is critical in order to have a good functional and aesthetic outcome with implant therapy. The process of tooth removal is normally followed by alveolar crest remodelling resulting in bone loss, loss of keratinised tissue. This prompted a lot of clinicians to place implants into fresh extraction sockets. This treatment protocol was accepted widely and became more popular.[9,10] Most of the time teeth are extracted or an extraction is indicated because of root fracture, chronic periapical pathology or chronic periodontal infection. In these situations, placing implants immediately after extractions was not considered a successful treatment option.

Some clinical papers have suggested that the residual infection in the socket is a predictive risk marker for the future implant infection and failure. It was also believed that chronic infection in the socket may interfere with the osseointegration process, thus resulting in failure, with the possibility of soft and hard tissue contamination near the implant surgical bed. This made a lot of clinicians believe that immediate implant placement into infected sites is a contraindication. Immediate post extraction implant have several advantages such as fewer surgical procedure, preservation of bone volume and shortening the time until the implant can be restored.[12]

Additional Advantages Of Immediate Post Extraction Implants Are Following:

- Shortening of edentulous time period.
- Reduction in the costs of treatment.
- Improving the psychological approach with the patient.
- Reduction in morbidity.
- Optimal aesthetic result, with an easier definition of implant position.

Several human clinical studies have demonstrated that with immediate post-extraction implants it is possible to obtain very high (›90%) long-term success percentages. [12-16]

Moreover many experimental studies have confirmed that a high percentage of bone implant contact can be achieved on a light microscopic level in animals when using immediate post-extraction implants.[17-20]

Most challenging aspect of immediate implant placement after extraction is ensuring adequate implants stability within the extraction socket. It has been suggested that the implant should be placed in to a minimum of 3 mm of solid bone apical to the extraction site. Micro-movements between the implant and the surrounding bone should be avoided to allow successful healing to occur. Schwartz Arad et al.(1997)[10] reviewed relevant literature on immediate implants into fresh extraction sockets and suggested that implants into fresh extraction sockets is successful when implants are placed 3-5mm beyond the extraction socket, as close as possible to the alveolar crest (0-3mm), with good primary closure. In the current case report, the implant was inserted 4 mm apical to the socket in order to achieve the primary stability.

Therefore, sufficient height and width of should be considered as selection criteria for this treatment modality. Further selection criteria include the

Following: (1) absence of clinical signs of acute periodontal or endodontic abscess formation, (2) establishment of healthy periodontal condition before surgery and instructing the patient in oral hygienic, (3) management of postoperative maintenance, and (4) patient compliance.

Lack of adaption of the alveolar bone in the cervical portion of the implant placed immediately after extraction can be a major drawback.[21-23] This space can be field by soft tissues, creating problems in the osseointegration of implant. In the present case, 0.5mm space was present between the external implant surface and the extraction socket wall. This space is called Jumping distance. Knox et al.(1991)[24] reported that the the concept of an osteogenic 'jumping distance' greater than 0.5mm may not allow for predictable bone deposition on the implant surface without the simultaneous use of a regenerative procedure. However, certain factors like implant diameter, type of infection, systemic disease, implant length beyond root apex, primary stability, surgical approach, debridement and different prosthetic

Conditions that influence the outcome of immediate implants into fresh extraction socket needs to be evaluated.

Conclusion: Placing dental implants immediately after extraction provides significant psychological and functional advantage over traditionally established placement. Immediate placement and provisionalisation for single tooth replacement allows for minimal disruption to marginal soft tissues providing immediate prosthetic support for peri-implant tissue through the use of carefully crafted provisional restoration. Immediate implantation has provided the implant dentistry the opportunity to achieve better and faster functional results and a predictable treatment strategy with a very high rate of success. Therefore, it can be a viable treatment alternative in implant dentistry.

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