

Immediate Implant Placement Following Tooth Extraction : A Case Report

Introduction

Loss of tooth in the aesthetic zone is a traumatic experience. Contrary to missing posterior teeth, nearly all patients have an emotional response regarding a maxillary anterior missing tooth.

The need to replace the tooth is not questionable, and financial considerations are less important. Therefore they are usually eager to be provided by the best possible replacement option and often perceive this option to be a single-tooth implant. According to the traditional protocols 3-4 months of healing period is required for the consolidation of extraction socket.

Taking into account the prosthetic treatment, in delayed placement of implant, a long treatment period is an obvious drawback. In recent decades, in order to remove the undesirable consequences of conventional methods, this protocol has been challenged by reducing the interval between tooth extraction and placement of the implant so that some clinicians have used "immediate implant placement" technique. In this method dental implants are placed in fresh sockets just after tooth extraction in the same clinical session. This allows clinicians to reduce the number of surgical procedures, resulting in shorter treatment durations.⁴ This procedure was originally described by Schulte et al <https://www.inkling.com/read/carranza-clinical-periodontology-newman-12/chapter-82/chapter82-reader-13-5093757d1913488293476954f3a54ae8> and Lazzara and has been reported to have similar implant survival rates as implants placed into healed ridges with long-term survival rates of approximately 94%.⁵

This paper present a clinical case where the extraction was performed using atraumatic extractor with implant placement in a maxillary lateral incisor.

Case Report

An 18 year old male patient presented to the Department of Prosthodontics, Rama Dental College-Hospital & Research Centre, Kanpur with chief complaint of poor appearance because of missing tooth in the left upper front tooth region. (Fig. 1)



Figure 1 : Pre-operative Intra-oral View Of 22 Tooth Region

Patient's general and medical history were taken was found to be not significant. Patient was examined clinically and Orthopantomograph was taken. After thorough analysis clinically and radiographically a root was found in relation to 22 which was well below the alveolar bone crest. It was evaluated and found that there was no underlying pathology and tooth root was unrestorable but was surrounded by healthy gingiva. It was there and then decided to go for extraction and place the implant immediately. The patient was very conscious about his aesthetics and was very keen for earliest possible restoration of his teeth and so he opted for proposed procedure. After proper treatment planning endo-osseous implant (Top Implants, Israel) measuring 4.2 × 16 mm in dimension was selected.

Surgical Protocol:

Atraumatic Extraction:Following an injection of 2% lidocaine with 1:100,000 epinephrine local anaesthetics, the root stump was atraumatically removed by the use of a



periosteal elevator. (Fig. 2)

Figure 2: Atraumatic Extraction Of The Root

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Stump Of 22 Tooth Using Periosteal Elevator And Forceps.

The resulting extraction socket was evaluated for osseous defects. All four walls



were found intact.

Figure 3: Intact Socket Walls Are Confirmed After Atraumatic Extraction.

Implant Site Preparation:Following atraumatic tooth extraction, initial preparation of the osteotomy site begins with a 2 mm round

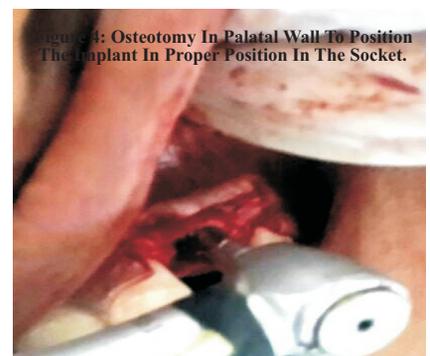


Figure 4: Osteotomy In Palatal Wall To Position The Implant In Proper Position In The Socket.

drill with copious irrigation. The pilot drill (D-2.0 mm) was then used for creating an osteotomy site of the appropriate depth. The osteotomy should extend beyond the apex of the extraction socket upto the 2 to 3mm from the opposite landmark. To avoid damage to the buccal cortical plate, the drill tip was positioned along the palatal wall of the extraction socket, half way to two-third distance from the crest of the socket. (Fig. 4)

It is indexed with various markings corresponding to the desired implant lengths. When appropriate depth was reached with the pilot drill, the probe was used for tactile perception of intact bony plates & or any perforations & the confirmation of desired osteotomy depth.

Once desired depth was confirmed, paralleling pins were placed to check the proper alignment of the implant with adjacent teeth & opposing occlusion. After confirmation of depth & angulation, the osteotomy site was prepared by a series of gradually larger drills (D2.6, D2.8, D3.2 and D3.8) to the requisite width with a speed of 1400-1600 r.p.m at 1: 16 reduction torque.

The Implant site was generously irrigated with sterile saline to remove any residual bone chips/other residue following preparation. The G BONE allograft (synthetic hydroxyapatite granules, G. Surgiwear limited, Shahjahanpur, India) was placed in the base of the socket. The implant was removed from the sterile vial using the insertion tool and delivered directly into the osteotomy site. Contamination by touching the implant with instruments made of a dissimilar metal or by contact with soft tissue, cloth or even surgical gloves may affect the degree of osseointegration. The implant was then pressed into the prepared site with manual pressure aided by the insertion mount & insertion tool attached to the implant head. Following which, the insertion mount was removed and hex driver was placed into the implant internal hex & tightened with torque-controlled implant ratchet. Implant was not forced into the socket with excessive force as this might lead to microcracks in the surface bone resulting in improper osseointegration. A 16-mm implant is threaded into position, under the prospective incisal edge and 3 mm below the facial free gingival margin. Because the socket is slightly larger in dimension than the implant, there is a gap between the buccal wall of socket and implant (jumping distance). (Fig. 5)



Figure 5: Placement Of Implant Into The Fresh Extraction Socket And The Empty Space Around Implant (jumping Distance).

To fill this empty space between implant and inner wall of socket and to increase the healing potential of surgical site, Platelet Rich Factor (PRF) along with an allograft material was placed in this empty space. (Fig. 6,7)



Figure 6 : Allograft And Prf Are Used To Fill The Gap Between Implant And Socket Walls



Figure 7: Allograft And Prf Are Placed Around Implant And On Socket Walls

Implant that was placed was checked for stability by applying gentle pressure to determine if it could be depressed or rotated. Also, primary implant stability was assessed with the torque controlled ratchet. The implant was placed and a final torque value was tested to be greater than 40 Ncm.

The cover screw, provided with the implant package was then placed using the hex-driver using finger pressure. At this point, implant was confirmed to be immobile, which re-affirmed primary implant stability. The flap margins were then repositioned & sutured tension free using 3-0 mersilk in interrupted fashion. (Fig. 8)



Figure 8 : Flaps Were Approximated And Sutures Were Placed.

A radiograph was taken post operatively to evaluate the implant angulation & position. The patient was on regular recall and under strict oral hygiene measures.

Discussion

Immediate placement of implants in fresh extraction sockets have several **advantages** over Branemark's protocol for conventional implant placement.

1. Total treatment time and number of surgical procedures is reduced.
2. more ideal implant positioning is possible.
3. soft tissue height and contour are better

preserved in the esthetic zone.

4. opportunities for osseointegration are better due to healing potential of fresh extraction socket.⁶

The disadvantages are as follows:

1. Lack of adequate available bone apical to socket may compromise primary stability
2. Facial malposition of implant is a common complication as the implant gets drifted toward the path of least resistance (labial cortex) during drilling. This is further complicated by presence of thick palatal cortex that pushes the drill more toward the labial side
3. Tension-free closure may be difficult to achieve in case simultaneous use of biomaterials is needed. Even, if achieved, it can lead to alteration of mucogingival junction.
4. An enhanced risk of infections and the associated failures if the socket becomes infected.
5. The mismatch between the implant surface and the socket wall, therefore gaps may be present after implantation since dental roots do not have a regular circular diameter shape.
6. The necessity of raising a flap for covering the implants, if a two-stage implantation procedure is preferred.

Immediate implant placement is most commonly **indicated** when Tooth Extraction Is Due To Trauma.

1. Endodontic Lesion.
2. Root Fracture, Root Resorption, Root Perforation,
3. Unfavourable Crown To Root Ratio (Not Due To Periodontal Loss) And
4. Bony Walls Of Alveolus Are Still Intact.⁷

Contraindications includes

1. Presence of Active Infection.
2. Insufficient Bone (<3 Mm) Beyond The Tooth Socket Apex For Initial Implant Stability And
3. Wide and/or Long Gingival Recession.
4. If There Is Interproximal Bone Loss (Aesthetic Zone) Due To Active Periodontitis And
5. In Some Systemic Factors That May Impair Healing (E.G. Smoking).⁸

Conclusion

Immediate implant placement following tooth extraction has been found to be a viable and predictable solution to tooth loss. Minimally invasive surgical technique, ease of procedure and shorter time involved together with minimum post extraction complications are the important advantages of this method. However, proper case selection and meticulous postoperative care preceded by good surgical and prosthetic protocol are the essentials for success. Patients with aggressive periodontitis need more investigation and trial before considering for immediate implant placement.

References

References are available on request at editor@healtalkht.com

