



Post-Trauma Replacement of Anterior Dentition: An Interdisciplinary Case Report

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Abstract

This case report illustrates an immediate implant placement and provisionalization in the replacement of a tooth in the anterior esthetic region while maintaining optimal peri-implant esthetics. The placement of immediate implants has demonstrated substantial and improved outcomes with promising results when compared to conventional implant placement techniques and procedures in the anterior zone, involving a treatment plan, meticulous technique, provisionalization, and its definitive prosthetic rehabilitation with reduced overall treatment time and maintenance of aesthetic and functional outcomes. When compared to conventional techniques and procedures of implant placement, implants placed immediately following extraction have shown significant and enhanced outcomes with promising results. In this case, excellent esthetics and clinical outcomes were well achieved resulting in improved quality of life. To guarantee implant success with desirable aesthetic results, careful planning and case selection are essential. For the replacement of anterior teeth with a focus towards aesthetics, immediate implant implantation and provisionalization appear to bring important advantages. This method of therapy aids in maintaining the physiologic architecture of the soft and hard tissues, which reliably results in enhanced aesthetic results and patient satisfaction. The attainment of primary stability is a prerequisite for long-term success and the immediate provisionalization must be planned to prevent any centric and eccentric contact during healing.

Keywords: Immediate Implant; Esthetics; Minimally Invasive Extraction; Peri-Implant Esthetics

Introduction

Loss of teeth especially in the anterior esthetic region makes prosthetic rehabilitation inevitable for which.

The success of dental implants has proven to be a reliable therapeutic option [1].

Immediate implant placement, defined as “the placement of dental implant immediately into fresh extraction socket site after tooth extraction”, has been considered an acceptable and predictable procedure.

With immediate implant placement, an implant is placed into the extraction socket immediately in order to

take advantage of the bone’s capacity for healing and avoid a 4-6 month waiting period [2].

Reduced overall treatment time and fewer surgical procedures are some of the benefits of immediate implant placement and restoration for single implants especially in the esthetic zone, with

the added benefits of preservation of the gingival architecture and greater patient comfort, satisfaction and improved esthetics along with osseous preservation [3].

Single-tooth restorations have been shown to have high success rates, especially when replacing anterior teeth. For the patient’s overall appearance, function, and esthetics, replacing lost maxillary front teeth is crucial. Schulte and Heimke described implant placement in freshly extracted sockets as “immediate implant” in 1976.

Potential benefits of this treatment approach have been noted as fewer surgical procedures, a shorter duration of treatment, ideal three-dimensional implant positioning, conjunctual preservation of alveolar bone adjacent to the site of tooth extraction, and soft tissue aesthetics [4].

The successful placement of immediate implants following minimally invasive extraction has been shown in several studies

to contribute to the preservation of soft tissue, crestal bone, and interdental papillae, enhancing peri-implant esthetics [5,6].

Researchers Hansson, *et al.* and Ericsson observed in their studies from 1983 and 2000 that reduced trauma from surgical placement of immediate implants, result in decreased the possibility of bone necrosis and allow bone remodelling to occur. The rapid period of healing enables the transformation of woven bone to lamellar bone. The natural socket being abundant in periodontal cells and matrix, cause healing that is more predictable and faster [7].

This article aims to present the case of a patient treated by means of immediate implant placement in the esthetic zone and its clinical follow-up at 6 months.

Case Report

A female patient aged 27 years, presented with a history of blunt trauma on metal handle of luggage bag. Patient complained of loose upper front tooth associated with severe, throbbing pain and increased sensitivity since the incident at the affected region and requested for an immediate solution. Patient reported no significant medical history and drug allergy.

Radiological evaluation revealed a horizontal fracture line (Ellis' Class 6) at the middle 1/3rd of root of 11 and Ellis' class 2 fracture is seen irt 21, partially obstructed by nose jewellery. Endosseous placement of implant with provisionalization following tooth extraction was suggested and the treatment plan was agreed by the patient. Following the administration of nerve block anesthesia, 11 was extracted using straight elevator by luxating the tooth with minimal damage to the socket (Figure 1).



Figure 1: Immediate post-op: extracted 11.

Endodontic therapy followed by a provisional crown build-up with light cure composite was done for 21. A thorough oral prophylaxis was also performed as part of Phase I therapy. Following CBCT imaging an implant of dimension 13 mm x 3.5 mm was planned to be placed for 11.

Prior to the implant placement, informed consent was obtained from the patient. A crestal incision followed by intrasulcular incisions extending to the distal and mesial aspects of the adjacent teeth was given following administration of local anesthesia. A full thickness mucoperiosteal flap was raised to expose the underlying periosteum (Figure 2).

The osteotomy sites were prepared with standard drills. Se-

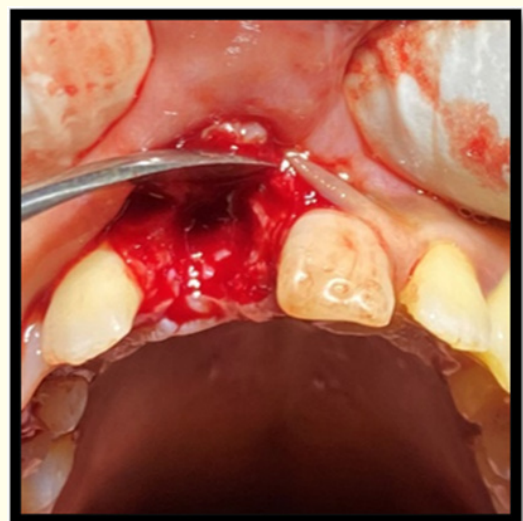


Figure 2: Incision and mucoperiosteal flap reflection.

quential drilling was performed at speeds between 1000 and 1200 rpm while being copiously irrigated. A guide pin was used to check for parallelism and the same was confirmed with chairside RVG. Implant of dimension 13 mm x 3.5 mm was placed in the prepared osteotomy site with a torque of 30 Ncm (Figure 3).

Post-operatively, patient was prescribed a combination of



Figure 3: Flap closure with 5-0 vicryl Placement of temporary abutment.

NSAIDs (aceclofenac, paracetamol and serratiopeptidase) twice a day after food for 3 days and was advised warm saline rinses following 24 hours postoperatively and onwards upto 3 days followed by 0.2% Chlorhexidine gluconate oral rinse b.d. upto 14 days. Patient was advised to maintain oral hygiene, follow a soft diet and refrain from applying pressure on the anterior teeth until loading was done.

At 3 weeks post-op, a second stage exposure of the cover screw was done and the implant was loaded [8]. Formation of an optimal gingival collar to aid emergence profile was carefully monitored over the course of time, and at 4 weeks post-op, closed tray putty impressions were recorded to fabricate a PFM crown for 11 (Figure 4A, 4B).

For 21, the crown was prepared priorly for an identical PFM



Figure 4: A: Post-op 45 days: formation of gingival collar.
B: Placement of implant abutment (angled 17°).

crown at the time of impression for the adjacent crown. Buccal deficit irt 11 was camouflaged via addition of pink porcelain at the apical margin of crown (Figure 5A, 5B). The crowns were retained using luting cement and occlusion and embrasures were checked. Post-op instructions to maintain oral hygiene were given and the patient was placed on periodic recall at regular intervals [9].

Discussion

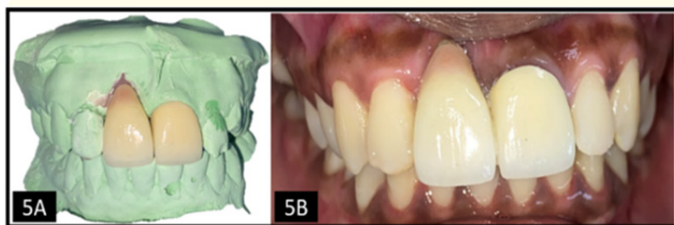


Figure 5: A, B: Delivery of PFM Crown irt 11,21.

Loss of tooth particularly in the aesthetic region can be emotionally challenging. The idea of “Immediate implants” has gained popularity because of the potential of achieving faster and better functional outcomes and a reliable treatment approach with an extremely high rate of success. Along with good cosmetic outcomes and an improvement in the patients’ quality of life, the main benefits are fewer surgical procedures are performed, a reduced time



Figure 6: Post prosthetic rehabilitation.

frame of edentulism, avoidance of loss of bone and soft tissue architecture, and quick provisionalization [10-12]. As a result, this technique for implant insertion has become the preferred treatment of choice.

The success of immediate implantation is largely dependent on the implant’s initial stability. A systematic review by Slagter, *et al.* systematic examined single tooth implants immediately placed in the aesthetic region and discovered a survival rate of 97.1% [13].

Extraction sites in the aesthetic sites provide a significant restorative challenge. Following tooth extraction, collapse of the hard tissue is typically accompanied by substantial resorption, remodeling, and deformity. The decreased crestal bone loss result in better soft tissue around the implant and enhanced esthetic outcomes [14].

The critical factors for rapid implant therapy have been established over time by clinical experience and include minimally invasive surgery, sterilisation, and atraumatic tooth extraction [15].

A minimum torque of 30 Ncm, implant length of at least 8 to 11 mm and an ISQ of at least 50 to 62 are recommended for immediate loading, according to a systematic review by Schrott in 2014 [16]. An anticipated success for immediate implant insertion and loading ranges from 87.5 to 100% [17].

In this case report, a 13 mm long implant was inserted with a 30 Ncm insertion torque. As a result, immediate loading was achievable, and a suitable emergency profile was established.

Following extraction, the loss of the face or buccal cortical plate, as reported by Misch and Judy in 2000, results in diminished bone thickness and height for implantation once the socket has healed. Adel S. Alagl and Khalid S. Hassan, in 2011 and reported a decrease in the alveolar bone’s breadth by 25% and its height decreases by

an average of 4 millimetres in the first year following several extractions.

After the first 2-3 years postextraction, Carlson and Persson (1967) and Misch (1999) also reported a 40%-60% reduction in width of alveolar bone, and Christensen (1996) noted the rate of bone resorption of at least 0.5-1% annually. Several studies demonstrate that placing implants right after removing a tooth helps to retain the height and breadth of the alveolar bone while reducing bone loss marginally.

After analysing pertinent research on immediate dental implants, Schwartz-Arad came to the conclusion that a survival rate of 93.9 to 100% was achieved for implants immediately placed in fresh extraction sockets [18].

Schwartz-Arad [18], Schropp [19], and Younis [20] reported that rapid implantation yielded better outcomes than delayed placement of implants. In this case, immediate placement of implant has shown excellent healing of soft tissue and reduced time span of treatment.

Pink ceramic was used to replace the buccal bone that was lost after tooth extraction in order to make up for the loss. Risks associated with an initial implantation include a greater chance of flap dehiscence, infection and remodelling of buccal bone, which can result in long-term marginal mucosa recession [21]. Nonetheless, there were no indications of infection or flap dehiscence in this study.

Conclusion

This case report reviews an immediate placed implant after immediate placement of implant followed by provisionalization and the management of esthetic concerns in trauma cases. It is now feasible to meet the requirements of patients for both form and function through the development of reliable surgical and prosthetic approaches. Due to shorter treatment times and the preservation of alveolar bone resorption, immediate implant therapy has been demonstrated to be a feasible alternative to delayed implant placement and to be a predictable way to replace teeth. The many advantages include fewer surgical visits, a shorter interval between tooth extraction and the placement of a definitive prosthetic restoration, reduction in resorption of bone and the preservation of soft tissue architecture. However, meticulous treatment planning, diligent post-operative care followed by good surgical and prosthetic procedures are crucial.

Conflict of Interest

The authors present no conflict of interest.

Bibliography

1. T Lovo María, *et al.* "Immediate Implant Placement in the Aesthetic Zone: A Multidisciplinary Management - Case Report". *International Journal of Oral and Dental Health* 6.3 (2020).
2. V Ebenezer, *et al.* "Immediate placement of endosseous implants into the extraction sockets". *Journal of Pharmacy and Bioallied Sciences* 7.1 (2015): S234.
3. Karl-Erik Kahnberg. "Immediate implant placement in fresh extraction sockets: a clinical report". *The International Journal of Oral and Maxillofacial Implants* 24.2 (2009): 282-288.
4. Stephen T Chen, *et al.* "Immediate or early placement of implants following tooth extraction: review of biologic basis, clinical procedures, and outcomes". *The International Journal of Oral and Maxillofacial Implants* 19 (2004): 12-25.
5. W Becker. "Immediate implant placement: treatment planning and surgical steps for successful outcomes". *British Dental Journal* 201.4 (2006): 199-205.
6. Joseph YK Kan and Kitichai Rungcharassaeng. "Interimplant papilla preservation in the esthetic zone: a report of six consecutive cases". *International Journal of Periodontics and Restorative Dentistry* 23.3 (2003): 249-259.
7. V Ebenezer, *et al.* "Immediate placement of endosseous implants into the extraction sockets". *Journal of Pharmacy and Bioallied Sciences* 7.1 (2015): S234.
8. L Tettamanti, *et al.* "Immediate loading implants: review of the critical aspects". *Oral Implantology (Rome)* 10.2 (2017): 129.
9. OA Farooqi, *et al.* "Appropriate Recall Interval for Periodontal Maintenance: A Systematic Review". *Journal of Evidence-Based Dental Practice* 15.4 (2015): 171.
10. G Polizzi, *et al.* "Immediate and delayed implant placement into extraction sockets: a 5-year report". *Clinical Implant Dentistry and Related Research* 2.2 (2000): 93-99.
11. L Schropp and F Isidor. "Timing of implant placement relative to tooth extraction". *Journal of Oral Rehabilitation* 35.1.S1 (2008): 33-43.
12. I Barzilay, *et al.* "Immediate implantation of pure titanium implants into extraction sockets of Macaca fascicularis. Part II: Histologic observations". *The International Journal of Oral and Maxillofacial Implants* 11.4 (1996): 489-497.
13. KW Slagter, *et al.* "Immediate placement of dental implants in the esthetic zone: a systematic review and pooled analysis". *Journal of Periodontology* 85.7 (2014): e241-e250.

14. PS Fu., *et al.* "Immediate implant placement following minimally invasive extraction: a case report with a 6-year follow-up". *The Kaohsiung Journal of Medical Sciences* 27.8 (2011): 353-356.
15. DW Siegenthaler., *et al.* "Replacement of teeth exhibiting periapical pathology by immediate implants: a prospective, controlled clinical trial". *Clinical Oral Implants Research* 18.6 (2007): 727-737.
16. A Schrott., *et al.* "Implant loading protocols for partially edentulous patients with extended edentulous sites--a systematic review and meta-analysis". *The International Journal of Oral and Maxillofacial Implants* 29 (2014): 239-255.
17. GO Gallucci., *et al.* "Implant placement and loading protocols in partially edentulous patients: A systematic review". *Clinical Oral Implants Research* 29.16 (2018): 106-134.
18. D Schwartz-Arad and G Chaushu. "Immediate implant placement: a procedure without incisions". *Journal of Periodontology* 69.7 (1998): 743-750.
19. Lars Schropp and Ann Wenzel. "Timing of single implant placement and long-term observation of marginal bone levels". *European Journal of Oral Implantology* 9.1 (2016): S107-122.
20. L Younis., *et al.* "Evaluation of bone healing following immediate and delayed dental implant placement". *The Journal of Contemporary Dental Practice* 10.4 (2009): 35-42.
21. A Barbisan., *et al.* "Soft Tissues Changes After Immediate and Delayed Single Implant Placement in Esthetic Area: A Systematic Review". *Journal of Oral Implantology* 41.5 (2015): 612-619.