

Immediate Placement and Loading of Single Implant in the Esthetic Zone: A Case Report

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Abstract: Single tooth replacement with a dental implant has become an increasingly favoured treatment option in the anterior maxilla. However, maxillary anterior tooth extraction results in bone resorption and often compromises gingival tissue for the implant restoration. An immediate implant insertion after tooth extraction may maintain the crest bone and the interdental papillae, thus achieving peri-implant esthetics and reducing the treatment time. Thus, the aim of this article is to describe a clinical case in which a fractured maxillary right central incisor was atraumatically extracted, followed by immediate placement of dental implant in prepared socket, the immediate temporization and transferring the emergence profile from the provisional to the final restoration. This permits a reduction of the number of implant components and consequently a lower cost of treatment, while at the same time maintaining acceptable aesthetic and functional outcomes and patient satisfaction.

Keywords: Dental implant, immediate placement, immediate loading, temporization, atraumatic extraction, emergence profile.

Introduction: Endosseous dental implant therapy is rapidly becoming the prosthetic standard of care for a vast array of clinical applications.^[1] A good biological integration is an essential prerequisite for the success of a fixed implant supported restoration. Conventionally, 3–4 months of healing period is required for the maturation of extraction socket. Taking into account the prosthetic treatment, patients have to wait for >6 months for the replacement of a lost tooth.^[2]

Loss of tooth in the esthetic zone is a traumatic experience with or without compromise in phonetics. As the aesthetic requirements of the patients have become increasingly important, patients require a treatment that should be fast, minimally invasive, and of low cost.^[3] In order to meet the modern needs of patients, approaches such as early or immediate loading following immediate implant placement in fresh extraction site have been proposed and are gaining acceptance, which reduce the number of operating sessions.^[4]

A favorable emergence profile is also very important

for the health of peri-implant tissues as it affects the effectiveness of oral hygiene.^[5,6] The gingival tissue at the interdental papillae can be formed into the desired shape if supported properly by a provisional restoration. Because the provisional prosthesis serves as an exact replica of the final restoration, it is crucial that the earlier mentioned outcome must be transferred with a simple, fast, and accurate technique.^[7]

In this case report, the harmony of soft and hard tissue was preserved by immediate implant placement and immediate loading in the anterior maxilla in fresh extraction socket and the gingival profile of the patient developed by provisional prostheses on implants was transferred fixed prostheses involving anterior region.

Case report: A female patient aged 62 years reported to the Department of Prosthodontics and Crown & Bridge with fractured right maxillary central incisor and wide space between left central incisor and right lateral incisor for restorative opinion (Fig.1). The patient was conscious about her esthetics and

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wanted the earliest possible solution. The patient was informed about various treatment options upon which she gave consent for implant supported prosthesis. The patient had a clear medical history, no active dental disease and no contraindications present for implant therapy.

Clinical and radiological evaluation with IOPA and CBCT scan revealed adequate alveolar bone and absence of periapical pathology (Fig. 2). It was decided to extract and place endosseous implant immediately and place provisional restoration.

Following administration of local anesthesia (2% lignocaine), the fractured tooth was atraumatically extracted using periosteal elevator (Fig. 3). The extraction socket was thoroughly cleaned. With the help of measurements of extracted tooth (Fig. 4) and radiographic evaluation, the ADIN implant with active threads measuring 4.2 x 13mm was selected. The implant site was prepared according to standard procedure (Fig. 5 & 6) and implant was placed palatally (Fig. 7), 1.5 mm from adjacent teeth (Fig. 8) and 3 mm apical to crestal bone (Fig. 9) with the insertion torque of 45Nm. Stability of implant was measured by Osstell implant stability quotient (ISQ) meter and multiple readings were obtained which state it to be highly stable (Fig. 10).

The preformed abutment was screwed to the implant (Fig. 11). A screw retained custom made composite crown was used for temporization (Fig. 12). It was checked for contacts in centric and eccentric occlusion. The left central incisor was restored with composite resin (Fig. 13) and post-operative instructions were given.

The provisional prosthesis was unscrewed after 4 months and the emergence profile could be appreciated (Fig. 14). The emergence profile was transferred from provisional to final restoration by extra-orally modifying the impression post. The temporary crown was attached to the implant analog and this assembly was fitted into the Dappen dish filled with putty impression material (Fig. 15). Thus the emergence profile was replicated in putty (Fig. 16). The impression post is then attached to implant

analogue (Fig. 17) and the space around it was filled with flowable composite (Fig. 18). After curing the composite resin, the customized impression post was removed from the Dappen dish (Fig. 19) and was attached to the implant intraorally (Fig. 20).

Final impression was made using open tray with putty and light body impression material (Fig. 21). Thus the transfer moulding was done with customized impression post (Fig. 22). The final prosthesis was fabricated of porcelain fused to metal and was screw retained. Composite resin laminate was given on left central incisor (Fig. 23). Thus, the rehabilitation was completed (Fig. 24). The clinical and radiographic appearances after 6 months showed good esthetics, osseointegration and maintenance of bone around the implant (Fig. 25).

Conclusion: The present study achieved its early result with immediate implant placed in the extraction socket followed by immediate temporization^[4]. Customised impression coping give the clinician the ability to reproduce the established emergence profile to the final restoration in an accurate way which is crucial in rehabilitations involving anterior teeth. Thus, this case report supports successful implant placement with desired stability by immediate loading in the fresh extraction socket with appreciable esthetic outcome.

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Fig. 1. Preoperative view - (a) Extraoral view



Fig. 1. Preoperative view - (b) Intra oral view



Fig. 2. Radiographic evaluation - (a) IOPA

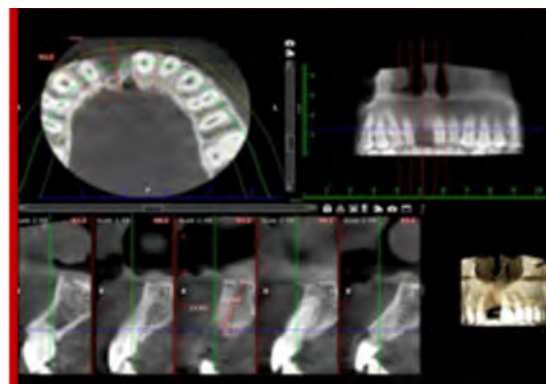


Fig. 2. Radiographic evaluation - (b) CBCT scan



Fig. 3. Atraumatic extraction

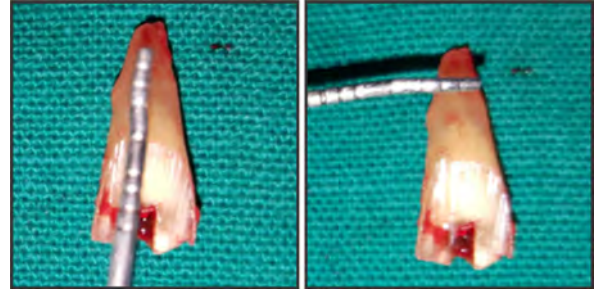


Fig. 4. Measuring the extracted tooth



Fig. 5. Lancet drill

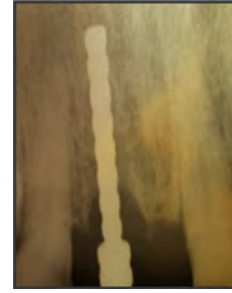


Fig. 6. Paralleling pin



Fig. 7. Implant placed palatally



Fig. 8. Mesio-distal position of implant



Fig. 9. Implant 3mm apical to crestal bone

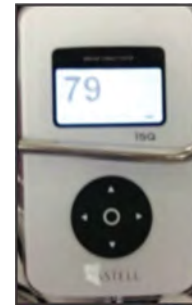


Fig. 10. Osstell implant stability quotient (ISQ) meter

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Fig. 11. Preformed abutment



Fig. 12. Provisional prosthesis



Fig. 13. Provisional prosthesis intraorally



Fig. 14. Gingival contour



Fig. 15. Impression of provisional prosthesis made in putty



Fig. 16. Emergence profile replicated in putty



Fig. 17. Impression post attached to lab analouge

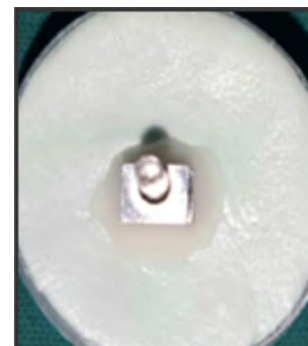


Fig. 18. Flowable composite injected around the impression post

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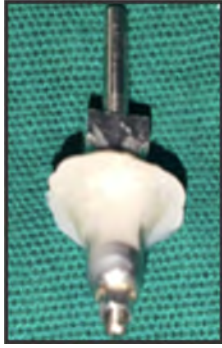


Fig. 19. Customised impression post



Fig. 20. Impression post attached intraorally

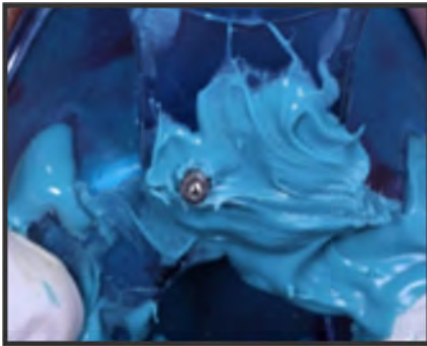


Fig. 21. Open tray impression with light body



Fig. 22. Transfer moulding



Fig. 23. Final prosthesis



Fig. 24. Extraoral view



Fig. 25. OPG after 6 months