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Case Report

Immediate Implant Placement to replace a retained deciduous tooth -A case report

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ABSTRACT

Implant placement in fresh extraction sockets has been thoroughly established. A waiting period of 12 months or longer to allow total socket healing results in pronounced resorption of buccal and lingual plate of the alveolar ridge. This paradigm has been challenged within the last decade by reducing the time gap between tooth extraction and implant placement. New protocols have been developed in which implants are placed at the time of extraction of the tooth, or soon after, before considerable bone resorption occurs, known as immediate implants. Immediate implant placement is now accepted in clinical dentistry for the rehabilitation of partially or completely edentulous mandible or maxilla. This article describes a case report of immediate placement of implant after extraction of retained deciduous tooth 85 in place of congenitally missing lower right 2^{nd} premolar and with conventional implant to replace missing permanent 46.

1. Introduction

The goal of implant dentistry is to provide a realistic and feasible treatment option for patients with tooth loss. Within the last decade, the "gold standard" implant treatment protocol has been challenged by experiments, which aimed at reducing the number of surgical procedures and shortening the treatment period.[1,2]

Schulte and Heimke presented a new protocol in 1976 that involved placing dental implants in fresh extraction sockets, which provided various benefits to the patient, including reduced surgical procedures, preservation of bone height and width, and increased patient comfort.[3] The success of this treatment is dependent on many contributing factors during treatment planning such as careful patient selection, defined bony socket walls, absence of active purulent infections and operator experience. On the other side, the morphology of the socket site, the absence of keratinized tissue, thin tissue biotype and lack of complete soft tissue closure over the extraction socket have a negative impact on the success of implants placed immediately.[4]

In immediate implant placement, dental implant is placed immediately into the extraction socket so as to take advantage of the healing potential of the bone. Pedro et al. described 93.5% survival rate of immediately placed implants for 5-year period.[5] This article describes a case report of immediate placement of implant after extraction of retained deciduous tooth 85 in place of congenitally missing lower right 2^{nd} premolar and with conventional implant to replace missing permanent 46.

2. Case Report

A 24-year-old female patient reported to the department of prosthodontics with the chief complaint of difficulty in chewing food due to mobile teeth in right lower posterior region. Clinical and radiological evaluation revealed retained deciduous 85 with resorbed roots, and

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congenitally missing 2^{nd} premolar. Permanent 46 was also missing with adequate alveolar bone height and width and absence of periapical pathology (Figures 1 and 2). So, it was decided to extract retained deciduous molar and place endosseous implant immediately and conventional implant in 46 region. Written consent was taken from the patient.

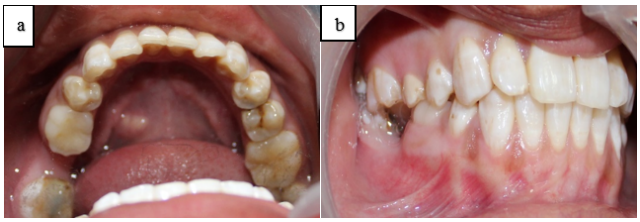

Fig. 1: a: Pre-operative occlusal view; **b:** Right lateral view.

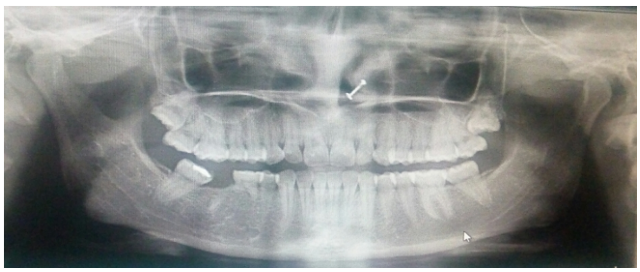

Fig. 2: Orthopantomagram

Routine blood examination was done for the patient and results were found to be within normal limits. Before surgery, the patient was told to rinse his mouth with chlorhexidene mouthwash (0.2%). After administering appropriate antibiotic and analgesic, local anesthesia was given using 2% lignocaine with 1: 80,000 adrenaline. Incision was given and flap was reflected (Figure 3a). As preservation of alveolar bone is key to success of immediate implants, the retained deciduous molar was atraumatically extracted using periotomes and small periosteal elevators (Figure 3b).

After extraction, the site was completely debrided using curettes, followed by thorough irrigation of the socket with Povidone - Iodine. The osteotomy sites were prepared by sequential drilling with speed ranging from 500 to 1200 rpm under copious irrigation (Figure 4a). Parallelism of both implants was assessed using the paralleling pin (Figure 4b). Two implants (Adin Dental Implant systems LTD; Israel) (4×11.5mm) were placed (Figure 4c) and primary stability of 35N was achieved followed by placement of 4mm size healing abutments (Adin Dental Implant systems LTD; Israel) in order to avoid second stage surgery (Figure 4d). Post- operative radiograph was taken (Figure 5a). Post operative instructions were given to the patient, and was asked to report after 1 week for suture removal.

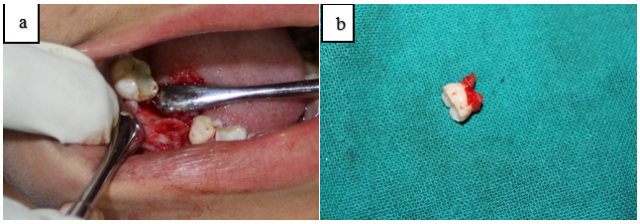

Fig. 3: a: Flap reflection; **b:** Extracted tooth

The patient was recalled after 3 months for the prosthetic procedures. Impression copings (Adin Dental Implant systems LTD; Israel) were placed and impression was made using closed tray impression technique (Figure 5c). A screw retained porcelain fused to metal crown was fabricated.

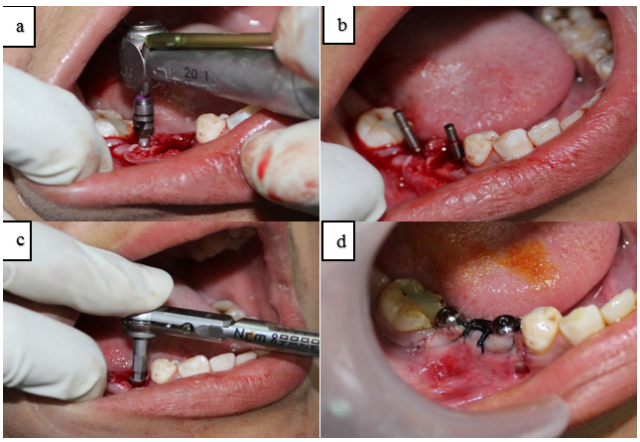

Fig. 4: a: Sequential drilling; **b:** Parallelism checked by paralleling pin; **c:** Implant placement; **d:** Healing abutments in position

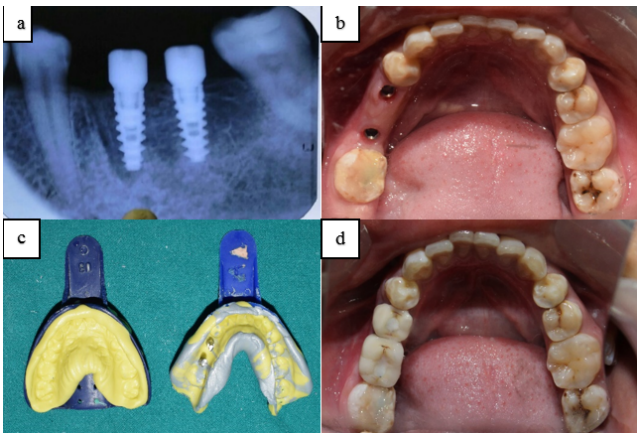

Fig. 5: a: Post operative radiograph; **b:**Healed peri-implant mucosa; **c:** Close tray impression; **d:** Cementation of prosthesis.

The prefabricated abutment (Adin Dental Implant systems LTD; Israel) was placed; a radiograph was taken to confirm the seating of the abutment. The abutment was

then torqued with the help of a torque wrench. The crown was soaked in chlorhexidine mouthwash for sanitization for 2 min then it was placed onto the implant and abutment screw was tightened to a torque value of 25N. A teflon plug was placed into the screw access channel and the opening is filled with a GIC cement (GC Gold label; GC Corporation, Japan) (Figure 5d). The patient was very happy with the final esthetic and functional outcome. Oral hygiene instructions were given to patient and recall after 3 months for regular check-up.

3. Discussion

The notion of "immediate implants" has gained popularity due to the ability to obtain better and faster functional results as well as a predictable treatment strategy with a high percentage of success.[6] Implant is the best treatment modality to replace congenitally missing permanent tooth in a young patient.

In this case report healing abutments were placed immediately after implant placement as the primary stability was more than 35N. The advantages of immediate placement of healing abutment is that there is no need for second stage surgery to uncover it at a later date and it decreases patient visits and shortens treatment time.

When an implant is placed in a fresh alveolus, there is generally a gap between the occlusal portion of the implant and the bone walls. Synthetic bone substitutes, membranes, or a combination of these can be employed to accomplish complete osseointegration in such defects.[7] Although several animal studies have indicated that osseointegration of immediately placed implants in the extraction sockets can be achieved without bone augmentation procedures, and with a success rate comparable to that of delayed implant placement.

The advantages of immediate implant include reduction of morbidity, reduction of alveolar bone resorption (controlled clinical studies have demonstrated an average of 4.4-mm of horizontal and 1.2-mm of vertical bone resorption 6 months after tooth extraction), preservation of gingival tissues, preservation of the papilla in the esthetic zone, and reduction of treatment cost and time.[8]

Contraindications of immediate implantation is acute periapical inflammation, socket-implant diameter discrepancies in excess of 5-mm, teeth with labial bony dehiscence or fenestration defects, insufficient bone apically to ensure primary stability of the implant, systemic factors that may impair healing (e.g., smoking), large bulbous root morphology, and interproximal bone loss.[9]

4. Conclusion

Immediate implant placement following tooth extraction has been found to be a reliable and a predictable solution to tooth loss. Regarding alveolar bone resorption and treatment time, the immediate placement of endosseous implants into extraction sockets is known to achieve a high success rate of between 94 and 100%, compared to the delayed placement. Good surgical and prosthetic protocols with proper case planning on the part of the practitioner and meticulous post-operative care and regular oral hygiene maintenance by the patient are the keys for a successful outcome.

5. Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/ her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

6. Source of Funding

None.

7. Conflicts of Interest

The authors of this manuscript declare that they have no conflicts of interest, real or perceived, financial or non-financial in this article.

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