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Case Report

Prosthodontic rehabilitation protocols for immediate implants

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Introduction

Implant dentistry is one of the preferred treatment options for rehabilitation of partially and completely edentulous patients.[1,2] The placement of implants can be immediate or conventional. In conventional implant placement the internal and external dimensions of extraction sockets and thus the dimensions of the residual alveolar ridge change with healing, which can lead to bone deficiencies that sometimes may contraindicate the placement of dental implant. The placement of implants in fresh extraction sockets reduces morbidity, decreases treatment time, and preserves bone in the residual alveolar ridge.[3,4] The technique involves atraumatic extraction of the tooth followed by implant placement. Voids between the implant and the socket walls are filled with a particulate bone graft material. This clinical case presentation describes the prosthodontic protocols involved in immediate implant placement.

Case report

A 37-year-old male patient reported with a chief complaint of broken upper right posterior tooth. Past dental history revealed that the patient had undergone endodontic treatment for the same tooth 5 years back and fractured while eating. Medical and personal history was non-contributory. Intra oral examination and radiographic evaluation using orthopantomography revealed partially edentulous maxillary arch with missing 24 and fractured 14 [Fig. 1]. Mandibular arch had full complement of teeth and the occlusion was mutually protective. No other hard and soft tissue abnormalities detected.

Intra oral peri apical (IOPA) radiographic evaluation showed fractured root at middle third in relation to 14. Treatment plan considered was extraction of 14 followed by immediate implant placement, and conventional implant placement in relation to 24.

Maxillary right first pre molar was extracted atraumatically under local anesthesia. The socket was carefully curetted to remove any infected soft tissue remnants. Implant was selected based on the preoperative investigation findings, on site clinical examination of the extracted tooth and socket dimensions. The osteotomy was performed using sequential drills following manufacturer's recommendations. Upon completion of osteotomy a 4.5 mm × 13 mm implant with abutment [Xive® implant system, Dentsply] was placed into the prepared socket [Fig. 2]. Demineralized freeze dried bone graft material [Dembone™, Pacific coast tissue bank, USA] was used to fill the horizontal defect dimensions of 1.5 mm (HDD). The implant stability was evaluated using resonance

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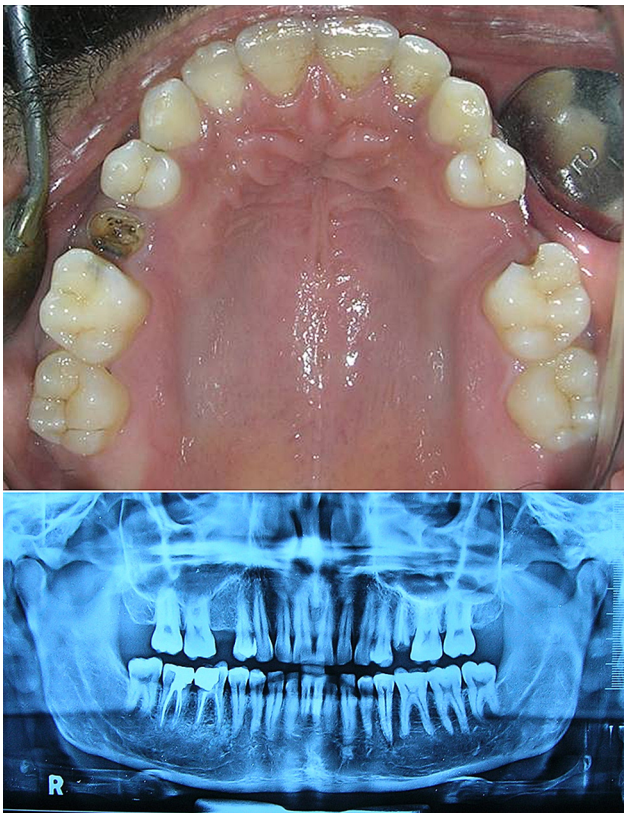

Fig. 1 – Pre-rehabilataion intra oral view & OPG.

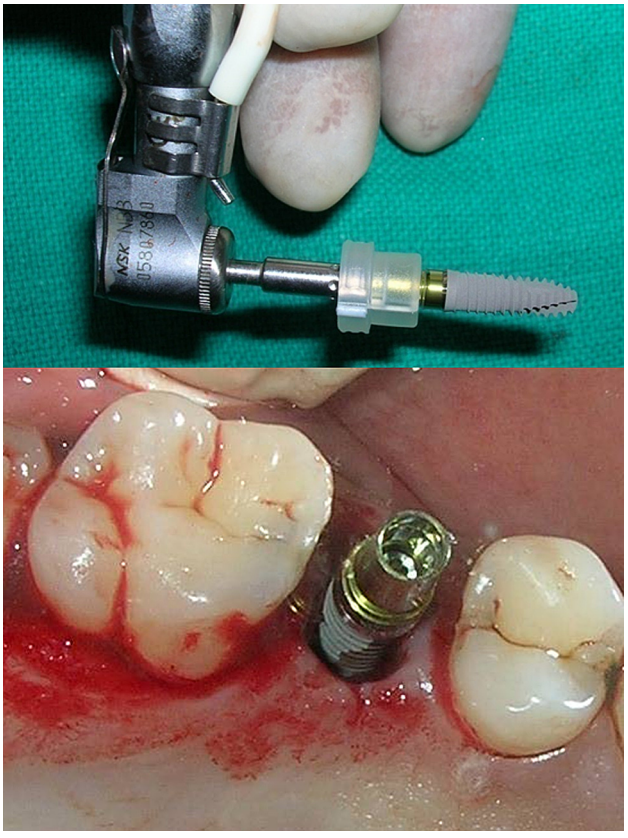

Fig. 2 – Implant with abutment.

frequency analyzer (Osstell, Germany). Immediate abutment removed, sealing screw placed and the site was sutured using 3.0 silk.

In relation to 24, crestal incision was placed and flap reflected. Osteotomy was performed using sequential drills under copious irrigation following manufacturer's recommendations. Upon completion of osteotomy a 3.75 mm × 13 mm implant [Xive® implant system, Dentsply] was placed, sealing screw placed and the surgical site was sutured using 3.0 silk.

The patient was prescribed necessary antibiotics and analgesics and postoperative instructions were given. After 06 months, radiographic and clinical evaluation reveled successfully osseointegrated implants. Second stage surgery was performed and during which implants were exposed and gingival formers were placed. After two weeks, Impression was made with elastomeric impression material (3M® ESPE AG, Germany) using closed tray technique [Fig. 3]. The master casts were retrieved followed by die preparation and fabrication of PFM crowns. A mutually protected occlusal scheme was selected considering patient's pre rehabilitation occlusion. The PFM crowns were cemented using type1 glass ionomer (GC Gold Label 1, GC Fuji, India) and the occlusion verified [Fig. 4]. The patient was evaluated clinically and radiographically for the last two years at regular intervals using OPG & IOPA radiographs for successful osseointegration and crestal bone loss and shown favorable results [Fig. 5].

Discussion

Indications for extraction prior to immediate implant placement include periodontally compromised tooth, root fractures, endodontic failures and root resorption. The first step in determining whether immediate implant placement is a reasonable clinical choice is the evaluation of the potential implant site. Residual extraction socket morphology changes with reduction in external dimension such as 5–6 mm (50%) in bucco-lingual direction and 2–4 mm (26%) in apico-coronal direction in 12 months. The internal dimension changes accounted for vertical socket height reduction by 3–4 mm and

Fig. 3 – Maxillary elastomeric impression.