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A Case Report on Single Implant Placement in the Mandibular Anterior Region

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Abstract

Implant therapy is today widely regarded as a reliable treatment option to replace missing teeth, both for function and aesthetics. Dental implants may be used to replace single teeth, replace multiple teeth, or provide abutments for complete dentures or partials. This topic focuses on the placement of single-tooth dental implants. The correct surgical placement of a dental implant is mandatory to obtain the ideal aesthetic result. Only through proper treatment planning correct position and number of implants can be determined. Before surgical placement of a dental implant, the adequate hard and soft tissue must be available. The clinician must consider the time needed for implant integration and soft-tissue healing, creation of emergence profiles, occlusal forces in relationship to progressive loading, and occlusal forces on the final restoration.

Keywords: Implant, Aesthetic Zone, Abutment, Prosthesis.

Introduction

Implant dentistry nowadays is considered to be an integral part of dentistry. The use of dental implants in the aesthetic zone has overcome many disadvantages of conventional restorative techniques. That is why implants are considered as an alternative treatment option for replacement of tooth as it restores both the function and aesthetics[1]. Traditional guidelines advise a 2-3 month period of socket remodelling after tooth extraction and an additional 3-6 months of load-free healing, which was essential for Osseo-integration in the 1980s. Alternative

protocols such as immediate implant placement at the time of extraction and a method of early implant insertion after a few weeks of soft-tissue healing have been used for about 20 years. Immediate implant placement has many advantages, such as preservation of crest bone, reduction in the number and complexity of surgical procedures, reduction of the edentulous period, and increased patient acceptance[2].

Immediate placement should be avoided in tooth with active periapical infection or periodontally compromised tooth with insufficient hard and soft tissue around which can lead to compromised primary stability. Before extraction, the tooth and the surrounding structure should be clinically and radiographically examined to assess the recipient site[3]. Advancements in the field of dental implant therapy have led to predictable survival rates of dental implants. The current definition of success in addition to long-term predictability, function and integration of the implant focuses on aesthetic considerations. In the anterior maxilla this is more critical due to the visibility of the region and if a high lip line is present, the smile line is more revealing thus increasing the need for an aesthetic result, with some authors ranking function and aesthetics in the anterior maxillary region to be of equal importance [4].

Case Report

A 36 year old female patient reported to the Department of Prosthodontics, Crown and Bridge and Oral Implantology, Himachal Dental College, Sundernagar with chief complaint of missing lower front teeth of the jaw due to trauma since last 2 years. Detailed intra oral examination revealed missing teeth on 31 and 41 regions. The patient's general periodontal condition was healthy, with pocket depths not more than 3 mm in all the teeth. The patient was presented with various treatment options, after discussing the pros and cons of each treatment modality the patient agreed on implant placement in the area of missing tooth. After proper treatment planning endo-osseous implant (Hi-Tec Tappered Self Threaded, Life Care Devices Pvt. Ltd , Isreal) 3.5 by 11mm in dimension was selected. Following an injection of 2% Lidnocaine with 1:80,000 anaesthetic agent in the area of missing central incisor. Crevicular followed by horizontal incision was made and the flap was raised. Bone width was measured to be 6mm and following the manufacturer's protocol for implant placement an ostectomy was drilled with the help of surgical template. A parallel sided, threaded, rough surface implant was then placed and primary stability was achieved. Continuous irrigation with betadine and isotonic saline was done throughout the procedure. Healing abutment was placed on top of the implant and the flap was sutured using 3.0 black silk sutures. Appropriate antibiotic (amoxicillin 500mg, TDS for 7 days) and analgesic (Ibuprofen 800 mg, every 4-6 hours, SOS) were prescribed and post-operative instructions were given. The patient was seen post surgically after one week for suture removal, no untoward sign or symptom was noted.

Six weeks after implant placement the healing abutment was removed and an impression coping was placed, followed by a poly vinyl siloxane (Aquasil, Dentsply/Caulk, Milford, DE). Open tray impression to capture the position of implant. The impression coping was removed and the healing abutment was replaced, shade was also recorded. The case was then sent to the laboratory for temporary crown and custom abutment fabrication.

The patient was now seen after 8 weeks of healing, at this time the healing abutment was removed and the customised abutment was placed. Abutment was torqued to 35N with help of a torque wrench. The temporary crown was then placed and proximal contacts as well as

occlusion was verified. The temporary crown was then cemented with the help of non eugenol based temporary cement. The excess cement was removed and the occlusion was verified again. After 16 weeks of healing since implant placement the temporary crown was removed and the gingiva was observed for healing, it exhibited adequate amount in interdental papilla and buccal contours were observed to be similar to adjacent tooth. Final restoration was delivered at 20 weeks after implant placement. The temporary crown was removed, abutment was cleaned with copious amounts of water and final crown was then tried in. The proximal contacts and occlusion was checked. The crown was then cemented using resin modified GIC cement. The patient was very happy with final aesthetic and functional outcome. Oral hygiene instructions were given to the patient and recalled after three months for regular check-up.

Fig1: Pre Operative Picture

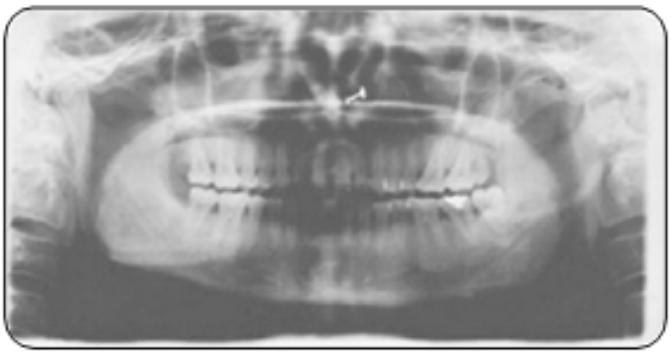

Fig 2: Pre-Operative OPG

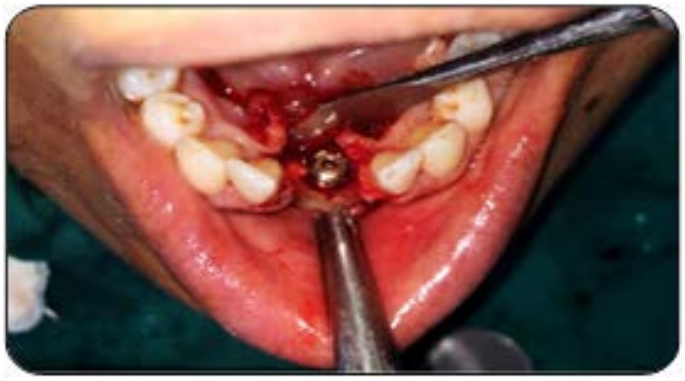

Fig 3: Suture Placement

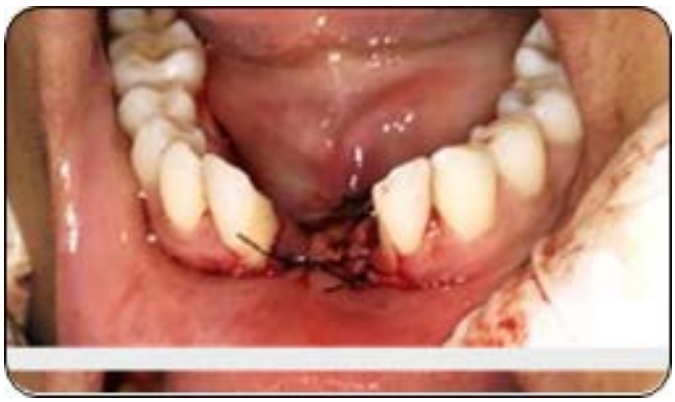

Fig 4: Gingival Former

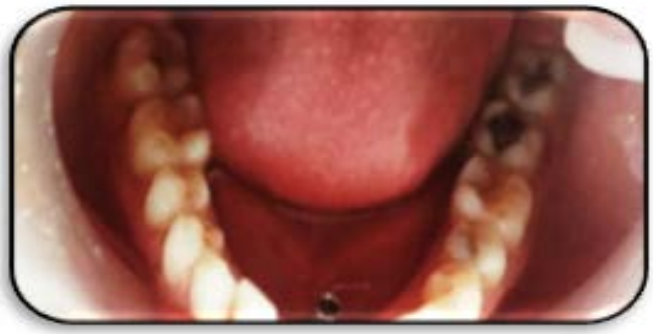

Fig 5: Abutment

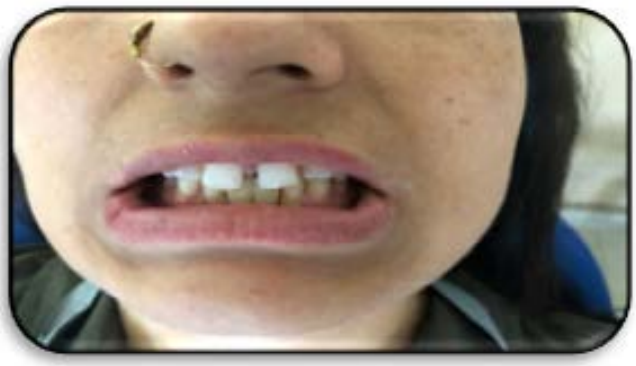

Fig 6: Final Prosthesis

Discussion

The use of implants in patients with teeth lost due to periodontal disease is now established practice. However the risk of failure increases in patients with periodontitis, smoking and poor oral hygiene. In agreement with the Sixth European Workshop on Periodontology implants were placed to support fixed prosthesis, after successful completion of initial periodontal therapy (full-mouth plaque score (FMPS) [5]. Standard Implant placement protocol with suitable individual modification according to bone quality in surgeons hand can obviate the need for extended surgical procedure[6]. Transitional implant behaves positively in maintaining inter-proximal bone and related soft tissues. Besides, it allows placement in limited mesial-distal arch spaces. Soft and hard tissue heals around one-piece implant different than that around two pieces implant. Aglietta et al. reported the survival rates of short-span implant supported cantilever fixed partial prosthesis. They reported five-year estimates for peri-implantitis were 5.4% (95% CI, 2.0-14.2%) and 9.4% (95% CI, 3.3-25.4%) at implant and prosthesis levels, respectively. Veneer fracture (5-year estimate; 10.3%; 95% CI, 3.9-26.6%) and screw loosening (5-year estimate, 8.2%; 95% CI, 3.9-17.0%) represented the most common complications, followed by loss of retention (5-year estimate, 5.7%; 95% CI, 1.9-16.5%) and abutment/ screw fracture (5- year estimate, 2.1%; 95% CI, 0.9-5.1%). Staffford suggested that solely implant-supported FPP or implant-supported single crowns should be the first treatment option. Tooth-implant-supported FPP, tooth-supported FPP with cantilever extensions and resin bonded fixed restorations are to be considered secondary treatment options because of their higher estimated failure rate[7]. Barzilay et al, Lazzara et al, Fugazzoto et al conducted experimental animal studies and concluded that osseo-integration occurs after placement of implants into fresh extraction sockets. Rosenquint et al, Ashman et al have reported successful outcomes related to immediate implantation at chronically infected sites. Nevertheless, it was concluded in a review of literature that infection associated with an extracted tooth contraindicates immediate implant placement[8]. Indications of Dental Implant Therapy have expanded with change in implant shapes, sizes, materials, coatings and technological advances, like guided tissue regeneration, immediate loading concepts. Research aiming at improving the design of implant's surface treatment like increasing bone to implant contact ratio with plasma sprayed surface, Ion-sputtering coating, Anodized surface, Sand-blasted and acid-etched, Hydroxyapatite coating and biochemical surface, aids in controlling the tissue implant interface with molecules delivered directly to the interface[9]. Determination of bone quality requires the use of the imaging computer or workstation. Hard copy dentascan images only include a limited range of the diagnostic grey scale of the study. Tilt of the patients head during the examination is critical[10]. There are three types of patterns used for edentulous arches: those designed for freehand drilling, those designed for semi-guided controlled directional drilling and those designed for fully guided controlled directional drilling. Fully guided surgical templates are used when precise control of angulation, location in the arch, and apico-coronal depth are critical to the success of the definitive prosthesis. Fully guided surgery has been proven to be a reliable and accurate method that reduces the damage to the alveolar nerve, sinus perforation, fenestration, etc. This guide provided not only precise implant placement but also flapless surgery whose advantage is minimal surgical procedure that supports the preservation of the blood circulation in the soft tissues, which may affect the soft-tissue architecture and reduce bone loss. All these factors

combined into a single implant treatment provided the successful implant placement in an old patient without complications. Though the possibilities of short implants are limited, they require further study from the point of view of long-term survival in difficult clinical situations in such patients with such methods described in this article [12].

Conclusion

Developments in the field of Implant Dentistry have been noticed and are widely accepted in clinics. Research works to improve the biocompatibility, peri-implant tissue have increased the success rate of implants. Latest advances in Dental Impant imaging has led to precision implant delivery and better prognosis.

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