Case Report

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Immediate Provisionalization and Papilla Preservation of a Single Implant in the Maxillary Esthetic Zone: A Case Report

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ABSTRACT

Background: Immediate replacement of a single tooth by the provisional restoration of dental implants is a procedure of growing interest among clinicians worldwide. However, the maxillary anterior region still presents a challenge because of the inherent difficulties encountered in the provisionalization and harmonic incorporation of the definitive prosthesis into the patient's dentogingival complex. There presents a clinical case of single implant placement on a maxillary central incisor, followed by immediate provisionalization and papilla preservation. The surgical and the prosthetic techniques are described and careful assessment must be made for an optimum aesthetic outcome.

Keywords: Immediate Provisionalization, Papilla preservation, Immediate loading, Implant abutment.

INTRODUCTION

The conventional technique aims to achieve proper osseointegration. Implants are required to be submerged without any load for 3 to 4 months in the mandible and 6 to 8 months in the maxilla.[1] However, short term treatment period is both beneficial for patients and dentists perspective. Esthetic expectations related to dental implant therapy are increasingly demanding and is of utmost importance. There has been a professional shift from osseointegration to "esthetic integration" which has been the limelight of the esthetic enhancement.[3]

At present, the clinicians and impalntologists are laying down more emphasis on immediate replacement of a single tooth by the provisional restoration of dental implants. The most common indication for implant placement is only tooth loss. The loss of a single tooth is an unpleasant experience for many patients and early/immediate implant loading is, therefore, an attractive treatment modality. However, individual teeth replaced by implants in the aesthetic zone are one of the most challenging situations faced by clinicians, even when using a two-stage implant protocol.[2]

Emphasis should be laid down for precise case selections have a predictable biologic, functional and esthetic management. This paper enlightens on a clinical case involving the proper placement of an implant, followed by its immediate placement, non-functional loading and papilla preservation in the maxillary arch for a better outcome

CASE REPORT

A 28-year-old healthy male presented with missing right maxillary central incisor that did not satisfy her esthetic demands anymore. In addition, the patient was feeling a dull pain in the area. The patient did smoke. History of trauma due to an accident in the upper anterior region 1 month back. On Examination, Missing maxillary right central

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incisor, Ellis class III fracture with 22, Grade I mobility with 21. IOPA with edentulous region reveals the fine trabecular bone structure and periapical infection with 21 & 22 (Figure 1).

Treatment options were advised to the patient after assessment of all clinical and radiographic data. The patient is willing to restore the missing tooth with an implant-supported prosthesis so treatment plan was root canal treatment with 21 & 22 followed by metal-ceramic crowns. Implant placement with 11 with papilla preservation and immediate loading and final prosthesis after 3 months.

Prior to implant surgery, preliminary impressions were obtained by using irreversible hydrocolloid impression material. Diagnostic casts for both the maxillary and mandibular arches were fabricated with type III dental stone, and they were mounted in maximal intercuspal position on a semi-adjustable articulator. A diagnostic waxing was made and a replica of the maxillary cast was made. A surgical stent was then fabricated with clear auto polymerizing polymethylmethacrylate resin. Root canal treatment was done with 21 & 22, tooth preparation followed by temporization with 21, 22 (Figure 2,3). On the day of the surgery, appropriate use of local anaesthesia with 4% articaine (1 : 100,000 epinephrine) was administered, and a full-thickness flap was reflected for proper visibility/accessibility (Figure 4). The osteotomy started with a round bur which was placed into the channel of the surgical stent and progressed with the 2.3mm twist drill, the pilot drill (Figure 5), and the 3.25 × 11mm shaping drill at 600 rpm, with the drill torque test set at 50Ncm. Outmost importance is given to engage the drills and the palatal wall of the socket.The osteotomy was performed under saline irrigation. An externally hexed Osseotite Adin implant was placed using 20 rpm at 40Ncm torque.The platform of the implant was placed 2mm apically to the cementoenamel junction of the maxillary central incisor (Figure 6). An implant abutment was reduced to the proper length. The final length and shape of the implant-abutment were accessed intraorally (Figure 7), with the provisional restoration in place. Furthermore, the clearance between the implant abutment and the temporary restoration was verified. Autopolymerizing polymethyl-methacrylate acrylic resin was added intraorally between the provisional restoration and the implant abutment, using the bead brush technique in a cautious and effective manner. After the polymerization was completed, the interim restoration-abutment complex was fixed (Figure 9).

Occlusion was checked, and any centric and eccentric contacts were removed. The reflected flap was sutured in place in approximation for proper healing and haemostasis in proper aseptic condition (Figure 10). Postoperative medications were prescribed to the patient, such as 625 mg (Amoxicillin/Clavulanate Potassium) twice daily for 5 days and the analgesic nonsteroidal anti-inflammatory drug Zerodol SP (Aceclofenac 100mg + Paracetamol 325mg + Serratiopeptidase 15mg), Aciloc 150 mg twice daily for 5 days. A 0.2% chlorhexidine mouthwash rinse was also prescribed and the patient was instructed to use it three times a day for fourteen days. Postoperatively, sutures were removed after a duration of ten days, and the patient was asked to consume a soft diet for one week.

Evaluation of oral hygiene and occlusion were conducted at an interval of three weeks. Period of six months of healing was observed and intraoral periapical radiograph was taken which revealed no areas of radiolucency around the implant. Thus, suggesting no signs of periapical pathology and inflammatory changes. The interim restoration were removed and a definitive impression were obtained.

After duration of six month of the implant placement, the interim restoration was removed and the implant abutment was screwed on to top of the implant as per the procedure. The final impression was done by close tray impression technique. A metal stock tray was used and impression was obtained by putty and light body material (Impregum, 3M/ESPE) (Figure 14). A definitive cast was fabricated from type IV dental stone (Figure 15) and was mounted in maximum intercuspal position with the mandibular caste on semi adjustable articulator for proper stabilization. The wax up was done around implant abutment, invested and casting done with high nobel alloy. And metal try in was conducted. (Figure 16) Application of porcelain on the metal coping was done and bake in the tradition manner using hot furnace. After achieving occlusal harmony restoration was glazed to perfection. (Figure 17)

After the delivery of definitive restoration, the patient was recalled at an interval of three months for the next year. On recalled visit the evaluation of the soft tissue ratio-implant ratio and implant to bone ratio is essential and mandatory. All sign of inflammation was also evaluated. As we all know, interdental papilla plays a critical role in the ordinarily healthy and optimum esthetic region, those achieved by final restoration.

Fig 1: Pre-operative photograph.

Fig 2: Tooth preparation.

Fig 3: Temporization With 21, 22 With 21, 22.

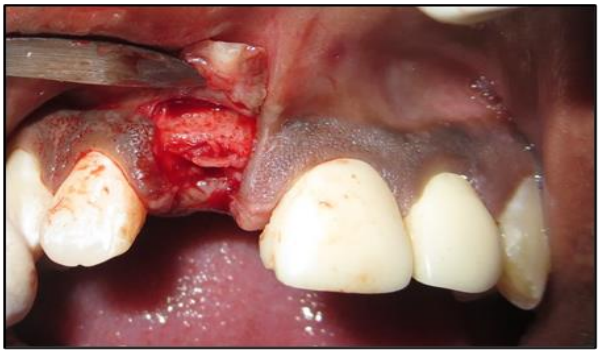

Fig 4: Full Thickness Flap Raised.

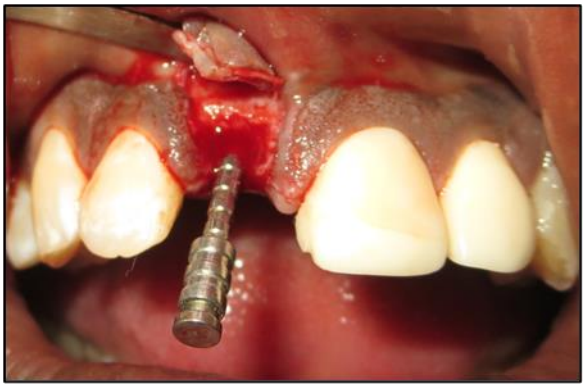

Fig 5: Pilot drill.

Fig 6: Implant placement.

Fig 7: Abutment placement.

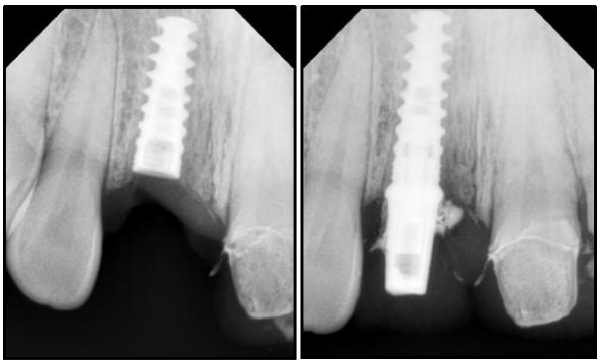

Fig 8: IOPA Post Implant And Abutment Placement.

Fig 9: Immediate loading done irt 11.

Fig 10: Sutures placed.

Fig 11: Follow up after 3 months.

Fig 12: Gingival retraction.

Fig 13: Emergence profile.

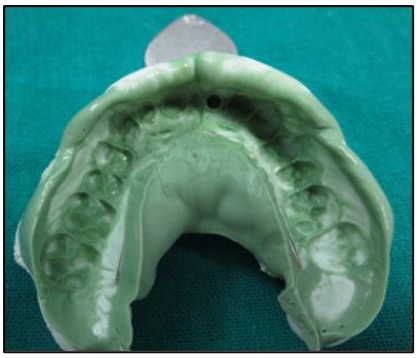

Fig 14: Impression obtained.

Fig 15: Metal coping.

Fig 16: Metal try in.

Fig 17: Final cementation.

Fig 18: Pre and Post-operative photograph.

DISCUSSION

The recent study demonstrated successful usage of an immediate provisionalization and non-functional loading of single implant prosthesis in the desired maxillary esthetic region. This systematic approach had a positive psychological influence on this young individual male patient. This gave immediate improve esthetic appearance and confidence to the individual, uplifting his job profile. The approach of this treatment is principally based on preliminary data regarding the maintenance of the residual ridge in both parameters (height, width) and the support of per implant issues with the interim restoration. Significance was also given to the preservation of interdental papilla around the definitive restoration.[7-9] Not more than seventy-two hours after surgery, immediate placement of implants has been defined as a suitable circumstance where the two-three superstructures are attached to the implants. The earlier concept was based on the progressive loading of the implant after four to six months to allow smooth and stress-free healing of the tissues. Thus, the immediate loading concept has the upper hand in comparison to the conventional concept of no loading, prior to osseointegration of the implant.

The concentration of recent clinical researches is based on shortening the healing period for a single-tooth implant and immediate implantation, loading in the esthetic zone of the anterior maxilla. Chaushu et al., and Ericson et al. found a eighty-six to hundred percent survival rate of single tooth replacements installed, according to one-stage surgical procedure and immediate loading.

It is suggested until unless optimal primary stability is attained, immediate provisionalization should not be done.The implant insertion torque should be a minimum of 720-30 Ncm. This value may vary in accordance with different authors. D1 and D2 type of bone is regarded as optimum for immediate loading.[6]

Successful integration of the immediately loaded implant was achieved in the recent case. When primary stability was achieved at the time of implant placement, the final implant insertion torque was thirty-five N-cm and immediate provisionalization was meticulously planned for the patient's comfort. After one year, the clinical and radiographic evaluation revealed better prognosis of soft and hard tissue integration of complete procedure. The highest merit of this procedure is the restoration of immediate function and aesthetics. Other qualities include avoidance of temporary denture, elimination of second-stage surgery and preservation of adjacent papilla.

CONCLUSION

In carefully selected cases, implant placement followed by immediate provisionalization for single-tooth replacement in the anterior maxilla may provide adequate aesthetic outcome and prove to be valuable to papilla preservation, alveolar bone resorption and positive psychological response.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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