

Anterior Implant Aesthetics

K. Krishna Sanghavi, M.S,B.D.S, Saveetha Dental College And Hospitals, Velappanchavadi, Chennai, Tamil Nadu , India

Corresponding author: K.Krishna Sanghavi, M.S,B.D.S, Saveetha Dental College And Hospitals, Velappanchavadi, Chennai, Tamil Nadu , India

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Abstract

Single teeth replaced by implants in the aesthetic zone are one of the most challenging situations faced by a clinician. Many studies have formulated a method for progressive shortening of the healing period for single-tooth implant placement and immediate loading being proposed for the aesthetic zone in the maxilla. The present report describes single tooth replacement in the anterior maxillary region by implant therapy followed by immediate provisionalization of the implant with bis acrylic composite (protemp). Implant placement and immediate loading of single tooth can provide an attractive treatment option in the aesthetic zone. Careful assessment must be made of mucosal and bone volumes in relation to implant placement for optimum aesthetic outcomes.

Keywords: Immediate loading, esthetics.

Introduction

Osseointegrated dental implants have historically been placed in accordance with the Branemark's 2 stage protocol. Implants were submerged and left to heal for a span of three to four months in mandible and six to eight months in maxilla. This meant that patients had to stand

by a significant time before prosthesis placement and many a times had to wear suboptimal provisional prostheses. Initially attempts were made for early loading of implants and were associated with increased failure rates. But with numerous advances being created within the field of implantology, implants can now be effectively loaded early or immediately in selected cases. Immediate replacement of single tooth by dental implants with provisional restoration is a procedure of growing interest among clinicians worldwide. Single tooth loss is perhaps the foremost common indication for implant placement.[1] The loss of a single tooth is a traumatic experience for many patients and early/immediate implant loading is therefore an attractive treatment option. However, single teeth replaced by implants within the aesthetic zone are one among the foremost difficult things facing a practitioner, even when using a 2stage implant protocol. Careful assessment therefore should be made of soft tissue and bone volumes for optimum implant aesthetics.

The following report describes replacement of maxillary lateral incisor by an implant along with immediate provisional restoration.

Case Report

A 28-year-old female patient came with a missing maxillary left lateral incisor desiring fixed tooth replacement [Figure 1]. The patient had been wearing removable dentures for last 2 years and was uncomfortable and dissatisfied with function and aesthetics.

On examination, the mesiodistal dimension was 7 mm and buccolingual width was 5.04 mm. The periodontal condition of the remaining dentition was healthy with a favorable occlusion. The periodontal biotype was thick. The patient had no significant medical history. Radiographic examination was done to evaluate the bone quality and dimensions [Figure 2]. An implant therapy was planned for the replacement of the missing tooth.

After anaesthesia, flap is elevated using crestal followed by sulcular incisions [Figure 3].

The osteotomy site was prepared using initial and final drill protocol. A 3.5 x 13 mm implant (Nobel Replace® Select Tapered) was inserted and the final implant insertion torque of 45N was achieved manually [Figure 4]. There appeared good primary stability and thus, immediate provisionalization of the implant was planned. The Implant post was screwed to the implant and an Putty index was fitted on top of it which was obtained from prior Diagnostic waxup for delivering provisionalization [Figure 5]. An acrylic provisional crown was fabricated and cemented to the implant post on the same day of surgery [Figure 6]. The crown was placed without incisal contact either centrally or in the lateral excursions.

Patient was instructed to use 0.2% chlorhexidine

mouthrinse for 1 minute twice daily and to avoid any trauma to the operated area. Prophylactic antibiotics (Amoxicillin 500 mg) and analgesics (Ibuprofen-Paracetamol) were prescribed three times daily starting from 1 hour prior to surgery up to 5 days postoperatively. Patient was instructed not to bite from the tooth for 6-8 weeks. At 3 months, good soft tissue contours were noted as well as hard tissue stabilization at the implant-bone interface [Figure 7]. The patient was scheduled for monthly follow-up visits. At 6 months postoperatively, the definitive restoration procedure was initiated and an metal-ceramic crown was delivered [Figure 8]. At the end of 1 year following implant surgery, optimal development of the soft tissue is noted [Figure 9].

Discussion

Immediate loading of oral implants has been defined as a situation where the superstructure is attached to the implants no later than 72 hrs after surgery.[2-3] The conventional concept included progressive loading of implant after 4-6 months to allow for stress-free healing. The high levels of predictability in implant therapy have encouraged re-evaluation of several aspects of the traditional protocol.[4-5] The immediate loading concept thus, challenges this conventional concept of no loading before the osseointegration of the implant. Recent experimental[6] and clinical[7-9] studies have concentrated on a progressive shortening of the healing period for single-tooth implants with immediate implantation and immediate loading in the aesthetic zone of the anterior maxilla. Ericsson et al[8] and Chaushu et al[9] found a 86-100% survival rate of single-tooth replacements installed according to a one-stage surgical procedure and immediate loading.

At present, it appears that premature loading per se does not lead to fibrous tissue encapsulation. Rather, its because of an excessive amount of micromotion at the

bone implant interface, during the healing phase.[5] A bone-to-implant contact develops over time, which is comparable with that of implants that are loaded conventionally.[10]

When immediate non-functional loading was compared with immediate loading in a controlled study, immediate non-functional loading increased the implant survival rate.[11] Occlusal contacts should thus be avoided during immediate loading of single-tooth implants. In the present cases, successful integration of the immediately loaded implant was achieved. As good primary stability was achieved at the time of implant placement and the final implant insertion torque was 45 N-cm, immediate provisionalization was planned for this patient. One year after implant placement and loading, the clinical and radiographic evaluation showed good soft and hard tissue integration.

The advantages of this procedure are obvious and include immediate function and aesthetics. There is no need for a temporary denture. Second-stage surgery is eliminated and adjacent papillae are well preserved, contributing to the final aesthetic result.[9]

It has been suggested that immediate provisionalization should be done only in case of optimal primary stability. The implant insertion torque should be a minimum of 20-30 Ncm; the value varying with opinion of different authors.[7] D1 and D2 type of bone are considered good for immediate loading. In case of softer bone, revised drill protocols should be used designed to enhance primary stability. Screw-type implants are preferred as their design allows a greater initial bone contact i.e., within the threads and a mechanical locking to achieve initial stability. Therefore, a threaded implant does not require osseointegration to resist load. Also, rough-surface implants show a better survival rate.[12] Enhanced

primary stability can also be accomplished by choosing a wider implant diameter.

The potential for micromovement can be minimized by avoiding any centric and eccentric contacts for a minimum of 8 weeks by prescribing a soft diet. The provisional restorations should not be removed during the healing period, to prevent any manipulation possibly jeopardizing osseointegration. In accordance with Wohrle[7], the main advantage seems to be the optimal maintenance of the existing hard and soft tissues resulting in very favourable aesthetic results without the necessity of hard or soft tissue augmentation. In spite of the many reports about successful immediate implant loading, we still have to accept the fact that, at present, only non-loading protocols are fully evidenced.

In conclusion, clinicians can treat their patients in a highly predictable way if the cases are selected carefully and treatment protocols aimed to achieve the best primary stability are strictly followed. Additional studies are required to see the long-term success of immediately loaded implants. Furthermore, additional knowledge is required to determine the minimal bone quality, quantity, minimal insertion torque and maximal occlusal loading for predictable immediate loading protocols.

Legends Figures

Fig.1: Pre-op missing tooth irt 22



Fig.2: cbct showing cross sectional view of width and length

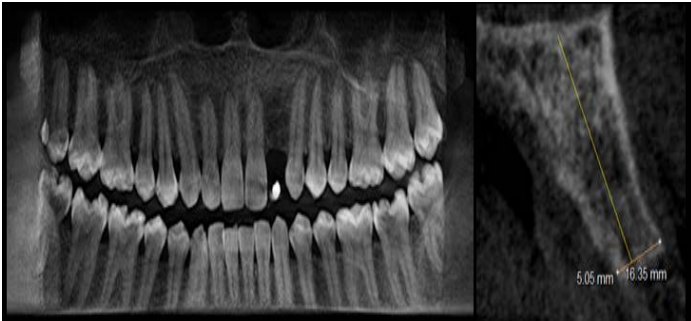


Fig.3: Flap Elevation



Fig.4: Implant Placement

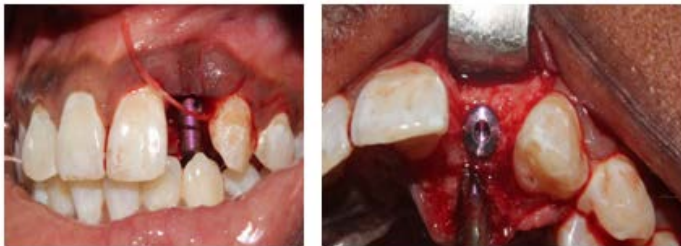


Fig.5: Implant post placement and Putty Index



Fig.6: Fixing of Temporary crown and suture placement



Fig.7: 3 Months Post-op showing soft tissue moulding



Fig.8: Fabrication of Permanent Prosthesis

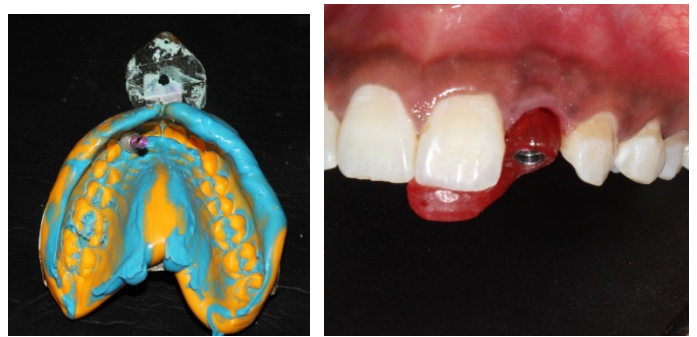


Fig.9 1 year Post-op Follow up



Conclusion

In carefully selected cases, implant therapy followed by immediate provisionalization for single-tooth replacement in the anterior maxilla may provide optimum aesthetic outcome and prove to be valuable to avoid soft tissue contraction, alveolar bone resorption and positive psychological response.

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