

# Placement of single tooth implant in healed socket with immediate temporization: Clinical study

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## Abstract

**Introduction:** Edentulous condition inadequately compensated for, by dentures, impair oral function and is accompanied by reduced self-confidence. In a continued effort to achieve these goals, implant dentistry was introduced. Immediate temporization is somehow a recent concept, which allows the maintenance of soft tissue contours, along with interdental alveolar contours. **Aims and Objectives:** Aims of the present study were to study the placement of implant in the post-extracted healed tooth socket of anterior maxilla and to evaluate the feasibility of early function on implants placed. **Materials and Methods:** In the present study, HI-TECH IMPLANTS TRX-OP one-piece immediate loading implant system with the built on abutment has been used. Immediate temporisation has been done and results have been evaluated in terms of stability, gingival health, esthetics, marginal bone loss, patient's psychological attitude, and satisfaction. **Results:** Out of eight implants, 6 successfully healed whereas 2 implants suffered failure **Conclusion:** Overall conclusion drawn from the study is, immediate temporization is a successful method providing psychological, financial and emotional benefits to the patient.

**Keywords:** Immediate temporization, implant, single tooth

## Introduction

Aesthetic implant restoration continues to be a focus of the surgical and restorative disciplines of dental implantology. Immediate temporization is somehow a recent concept, which allows the maintenance of soft tissue contours. Moreover, one stage approach saves the patients and clinicians time and money; therefore, immediate temporization is becoming state of art procedures for implant clinician.<sup>[1]</sup>

In the present study, HI-TECH IMPLANTS TRX-OP one-piece immediate loading implant system with the built on abutment has been used. During follow-up period, patients were judged according to *Implant Quality Scale* established by James and Mish.

## Materials and Methods

The present study was conducted on 8 patients reporting to

the outpatient Department of Oral and Maxillofacial surgery, Punjab Government Dental College and hospital, Amritsar. Following inclusion criteria was taken into consideration. Absence of periodontal disease. Adequate bone volume to receive the implant. Adequate buccal cortical plate (pre-operative, intra-operative). Grafting limited to circumferential bone defects.

Following was the exclusive criteria taken for patients into consideration:

Patients in growing age.  
Patients with osseo metabolic disorders.  
Patients with para-functional habits like bruxism, deep bite.  
Patients with chronic habits like smoking, chewing tobacco or eating pan masalas.  
Patients with systemically compromised situations like uncontrolled diabetes, liver and renal disorders, taking steroids or anti-cancer drugs.

## Pre-operative evaluation

A proper case selection was made on the basis of detail history, clinical examination, proper radiological examination, and thorough assessment of study models.

## Pre-operative management

Patients were administered 1 g of amoxicillin 1 hour prior to surgery and then, 500 mg 3 times daily for 5 days post-operatively. All patients were asked to rinse with 0.12% wt/vol chlorhexidine gluconate mouthwash for 1 minute pre-operatively and then twice-a-day for 1 minute for 1 week post-operatively.

## Armamentarium

HI-TEC TRX-OP one piece with abutment, non-submerged,

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tapered at apical 5 mm, sandblasted, and acid-etched surfaced implants were used. The length of implant was 10 mm and 13 mm, and diameter was 2.80 mm, 3.70 mm, and 4.50 mm.

### Surgical drills

Surgical twist drills of assumed diameters ranging from 2.0 mm to 4.3 mm were used in sequence to prepare the site.

### Depth gauge/paralleling pins

These gauges were used to obtain parallel preparation and to guide the direction of drilling preparation. They were also used to measure the depth of the surgical preparation for implant placement.

ATR (Advanced Technology Research) physiodispenser and reduction hand piece with internal irrigation was used for bone drilling.

### Fixture insertion tools

Fixture insertion tools i.e., XOT (small and large) for 2.8 mm and 3.7 mm and TIT (small and large) for 4.5 mm implants were used manually and with Hex Ratchet for final insertion of the implants in its proper position.

### Surgical technique

After achieving required asepsis and anesthesia, palatocrestal-scalloped incision with sulcular relief was given, and full thickness mucoperiosteal flap was elevated.

Bone drilling was performed with internal and external irrigation throughout the drilling process, and sharp instruments were used in progressively increasing diameters.

Initially, site was marked using round bur. After the site was marked, the pilot drill of 2.3 mm diameter was used at a drill speed of 700-1000 rpm with copious internal and external sterile saline irrigation. The pilot drill is indexed with markings to correspond to various implant lengths and was used to create a site of appropriate depth for the implant placement. Progressively increasing diameter of twist drills was used according to the length and diameter of implant.

The implant was then placed into the prepared socket, and snug fitting was ensured to prevent any mobility.

Temporary shell crown was placed using clear acrylic within 24 hours.

During follow-up, patients were evaluated according to *implant quality scale* published by James and Misch.

### Observations

The present study was undertaken on 8 adult patients with esthetic and functional problems due to missing teeth in the anterior region who reported to Department of Oral and

Maxillofacial surgery, Punjab Government Dental College and Hospital, Amritsar.

Observations were made post-operatively on 1<sup>st</sup> day, 1<sup>st</sup> week, 4<sup>th</sup> week, 3<sup>rd</sup> month, and 6<sup>th</sup> month for pre-designed factors, which were pain, stability, gingival status, mean probing depth, peri-implant radiolucency, and marginal bone loss.

### Results

The age of patients included in this study ranged from 20-40 years. Maximum number of patients was males with missing central incisor in this study.

Gingival inflammation was present in 100% of cases at first week. In one patient, gingival inflammation remained persistent at the follow-up period of 1 month. In another case, inflammation was severe at the follow-up period of first week and within 15 days, implants was removed. With time, there was reduction in probing depth in different time intervals in different patients. Implant mobility was absent from maximum no. of cases, except 2, in which implant mobility was noticed with an interval of 15 days to 1 month. In both cases, implant was removed. Bone graft was needed in 2 patients in our study [Figures 1-5].

### Discussion

Missing teeth can cause loss of self-esteem and have an impact on social life. The implant-supported prosthesis can overcome these problems and has proved to be a significant addition to restorative dentistry (Carl E Misch, 3<sup>rd</sup> edition, 2008)<sup>[1]</sup> This was one of the main reasons to consider an endosseous root- form implant. The present study was conducted on 8 patients. Implants were placed in the healed site of anterior maxilla with immediate temporization.

Optimal esthetics in the anterior maxilla may be more difficult to obtain than optimal osseointegration (Polizzi G<sup>[2]</sup>) since requirements for ideal esthetics come into picture.

One-piece design with no separate abutment screw was used in the present study since advantage of this design is increased strength, elimination of the risk of abutment screw loosening, and reduced crestal bone loss due to non-existence of microgap between the abutment and implant (Parel S.M. and Schow S.R., 2005).<sup>[3]</sup>

Immediate temporization of single tooth was considered since the site was in esthetic zone and there was need for ideal soft tissue drape. Immediate temporization in the form of non-functional immediate tooth carries certain advantages like fixed esthetic tooth replacement soon after surgery, no para-functional forces from occlusion, no need to countersink the implant below the crestal bone, which reduces early bone loss, and excellent soft tissue emergence.



**Figure 1:** Elevation of full-thickness mucoperiosteal flap



**Figure 2:** Bone drilling



**Figure 3:** Implant placement using ratchet



**Figure 4:** Implant placed



**Figure 5:** Temporary crown placement

Disadvantages of non-functional immediate teeth include micro movement of implant that can cause crestal bone loss and acrylic, which may become trapped under tissues or between implant and crestal bone. This problem was reduced greatly as the implants used in our study had the crest module larger in diameter than implant body.<sup>[4]</sup>

The primary disadvantage of immediate loading is the risk of

implant failure or greater crestal loss around the healing implants. Overloading of the implant could be a factor for implant failure in immediate loading. Hence, immediate temporization and not immediate functional loading was considered in our study.

Recession at the mid-buccal aspect is a common occurrence with implant restorations and is usually in the range of 1 mm and, therefore, some authors suggest flapless surgery (Michael Norton, 2004,<sup>[5]</sup> Parel S.M. and Schow S.R., 2005<sup>[3]</sup>) in order not to disturb the gingival architecture. In all the cases in our study, mucoperiosteal flaps were raised and special care was taken to leave the papilla intact. Temporary crowns had a positive impact on the soft tissue with respect to the preservation of the papillae.

Placement of implant at correct angulation is again very important. In the present study, one case was found to have buccal defect, as a result of which implant was placed at slight palatal angle and GBR was considered.

In one case of implant failure, patient had the tendency to touch the implant with tongue in spite of due instructions. Failure might have occurred because of continuous manipulations.

In the developing country like India, implant treatment is an expensive treatment, which was one of the factors for limited sample of the study.

In the present study there was no mobility at any time interval in maximum no. of patients (6 out of 8). According to Smith D.E and Zarb G.A (1986)<sup>[6]</sup> one of the criteria for implant success is that individual unattached implant should be immobile when tested clinically. According to Block M. *et al.*, (2004),<sup>[7]</sup> 94.6% was given the success rate, which was found similar to single tooth implants treated using two-stage protocol. Though in our study, the success rate was 75%, failure was not due to immediate temporization, but in one case, because of uncooperation on the part of patient and in other case, due to poor selection of the patient because of lack of investigations. This emphasizes the need for proper history of para-functional habits, patient cooperation, proper counseling, and investigation like dentaScan to see the width of bone at all levels.

## Conclusion

Based on the observations made and duly discussed, single tooth immediate temporization of implant is effective technique when proper history counseling case selection and meticulous surgical techniques are followed. Within the limits of present investigations, implants with immediate temporization in the healed socket of anterior maxilla were found to have 75% success rate.

Six results were found to lie within group 1 (success) and

other 2 were found to lie in group IV (absolute/clinical failure) according to scale given by "JAMES AND MISCH".

Overall conclusion can be drawn from this study that immediate temporization is a successful method providing psychological, financial, and emotional benefits to the patient by eliminating the need for second surgery.

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