

# Immediate Loading Of Partially Edentulous Mandible With Interim Screw Retained Fixed Prosthesis: A Clinical Case Report

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## Abstract:

Immediate loading of implants in the mandible has numerous advantages. The standard 2-stage approach requires the patient to wear a removable denture until the final prosthesis is produced, allowing the implants to heal submerged in the bone. In comparison to a traditional denture, an immediately loaded prosthesis provides greater patient comfort and function during the implant healing period. The conversion prosthesis technique for fabricating a provisional fixed prosthesis for a partially edentulous arch, immediately following abutment connection is discussed in detail. This article describes a technique for constructing an immediately loaded prosthesis on four implants in a partially edentulous arch in a time-efficient and dependable way. The goal in treatment was to retain as much natural dentition as possible, replace missing teeth immediately following extraction, and create a positive dental experience.

**Key Words:** conversion prosthesis, fixed prosthesis, provisional prosthesis, transitional prosthesis, Immediate occlusal loading, interim screw-retained prostheses

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## I. Introduction

Modern dentistry has witnessed, over the last decades, a rapid and continuing evolution of techniques in different fields. The implant-rehabilitation protocols, have been redefined over the years. Since Branemark introduced the osseointegration system in 1977, new protocols have been proposed regarding the prosthetic-load timing, up to immediate implant loading. Classic protocols propose that implants should receive no loading during the osseointegration period, usually 3 to 4 months in mandible and 6 to 8 months in maxilla. Updated protocols have shortened the healing period, so that implants could be loaded early and even immediately. Esposito et al. have defined 3 protocols for implant load timing: immediate loading implants (ILI), within 1 week from implant placement; early loading implants (ELI), between 1 week and 2 months; and conventional loading implants (CLI), after 2 months from implant placement<sup>1</sup>. The concept of immediate implant loading has recently become popular due to less trauma, reduced overall treatment time, decreased patient's anxiety and high patient acceptance.

For multiple implants, immediately after implant placement, immediate prosthesis can be adapted by fixing it to titanium copings<sup>2</sup>. In addition, postoperative bleeding and protecting the mucosa from prosthetic materials may be challenging when fixing the denture to the titanium copings. For the procedures to be completed in a precise, safe, and time-efficient manner, a rigid pickup material that polymerizes rapidly when picking up the titanium copings is recommended.

## II. Case Report

A 62-year-old male patient reported to the Department of Prosthodontics with a chief complaint of multiple missing teeth in the lower arch since 2 years. After intraoral examination, Kennedy's class III mod 2 edentulous span was found. His main concern were the missing lower anterior teeth and wanted them to be rehabilitated immediately. The teeth present were 33, 36, 37, 43, 45, 46 and 47.

A thorough examination was performed clinically and radiographically. There was adequate width and height of bone to accept dental implants. Significant gingival recession was noted around the canines on both right and left side of the arch. It was proposed that the teeth in question required extraction. Options proposed included extraction of both the canines followed by placement of 4 implants in the region of 36 to 44 distributed evenly and temporary acrylic fixed prosthesis.



Figure 1: Pre operative condition

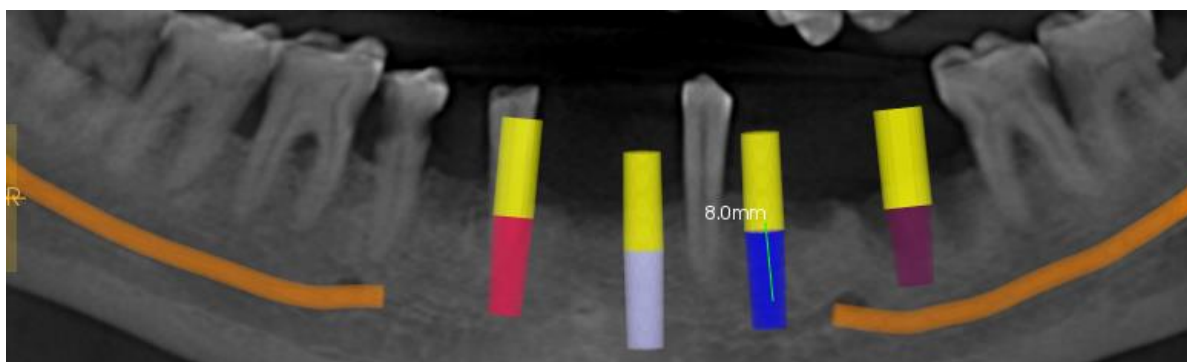


Figure 2: Treatment planning using CBCT

### Surgical Phase

A midcrestal incision was performed, and a full-thickness flap was raised. The canines were extracted without excessive enlargement of the socket. The sockets were debrided with curettes and an immediate implant was placed in the fourth quadrant. Primary stability was achieved by wrenching the implant into the bone beyond the apex of the socket. Immediate implant in the third quadrant in the canine region was avoided due to periapical pathology. Three delayed implants were also placed in the region of 45, 44 and 31. Following implant insertion, temporary abutments were positioned on the implant and interrupted sutures were placed (Fig 3-4).



Figure 3: Mid crestal incision over the site

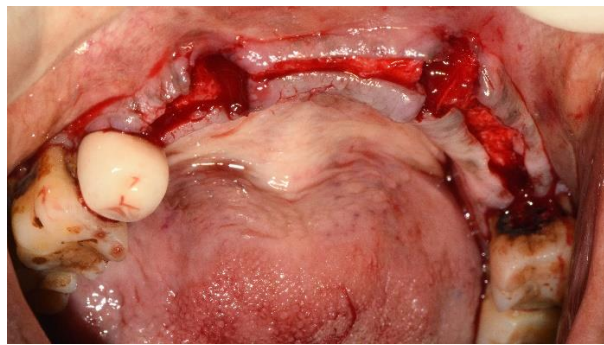


Figure 4: Intra oral view after extraction of canines



Figure 5: Extracted Canines

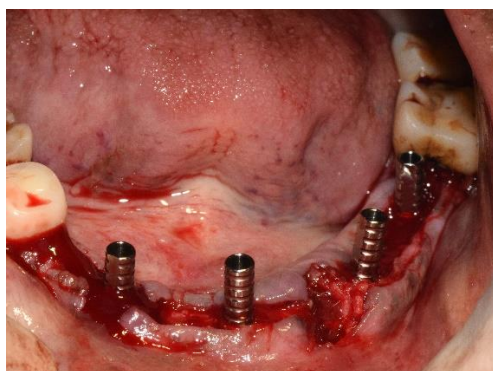


Figure 6: Temporary abutments placed on the implant



Figure 7: Post operative view



Figure 8: Post operative frontal view

### **Prosthetic phase**

A partial denture was fabricated conventionally prior to implant placement. To seat the denture on the cast, an alginate impression with the temporary abutments in place was taken. The impression was poured with

type IV dental stone and a cast was prepared (Fig 9). The casts were mounted on the articulator. To seat the copings in the denture in the patient's mouth, they were adapted on the cast passively. Once the denture seats passively, it was made sure that the occlusion and the occlusal vertical dimension were not altered. If the titanium copings interfere with the occlusion, they were shortened using burs.

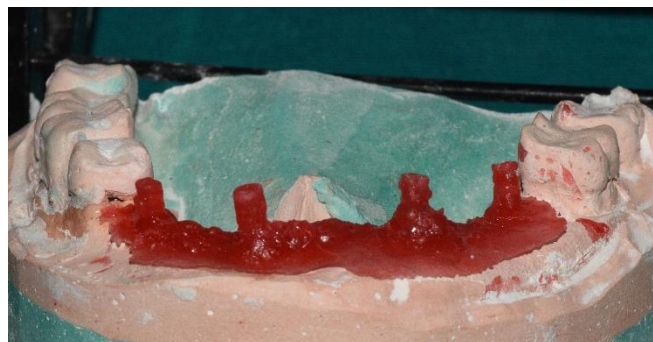


Figure 9: Cast prepared for adaptation of partial denture

Autopolymerizing acrylic resin was used on the intaglio surface of the denture and on the ridges inside the patient's mouth after being adapted on the cast. Be sure to have sufficient acrylic resin around the copings when the denture is seated in the patient's mouth. The screws should be completely visible prior to resin polymerisation. After the acrylic resin hardens but prior to detectable heat from exothermic reaction, the prosthesis is unscrewed and removed from the patient's mouth. Only the crest of the denture base was allowed to remain in contact with the residual ridge and the lingual, labial, and buccal flanges were removed to the desired length (Fig 10).

The prosthesis was checked both clinically and radiographically to verify the fit of the copings. Acrylic resin was added in the denture where necessary to fill any voids, especially around the copings, and the resin was allowed to polymerize. The prosthesis was highly polished to minimize plaque retention and was seated in the mouth. The screw access holes were covered with Teflon tape followed by composite. The patient was given the post insertion recommendations.

The patient was recalled after four months for the final prosthetic procedures and was given porcelain fused to metal crowns over the implant (Fig 11).



Figure 10 (a): Autopolymerising acrylic resin placed for pickup

(b): Provisional prosthesis occlusal view



Figure 11: Final prosthesis placed after 4 months

### III. Discussion

The technique of chairside conversion of an immediate or conventional denture to a complete-arch, fixed implant-supported prosthesis was first described by Balshi in 1985<sup>3</sup>. This technique is still popular because of its simplicity, adaptability to changes in planned implant positions, and reduced treatment cost. Acrylic resin is commonly used directly intraorally to fix titanium copings during immediate fixed complete denture fabrication<sup>2</sup>. The provisional prosthesis allowed the patient to evaluate appearance and function and the dentist to evaluate oral hygiene. The use of a provisional prosthesis is a concept of prosthetic management that helps promote patient comfort and acceptance. It provides a fixed dentition immediately and eliminates the need of stage 2 surgery. Its stability provides improved functional ability and allows the patient to preview the function and esthetics of a fixed implant-supported prosthesis.

Although the combined surgical and prosthetic procedure creates a lengthy treatment session, it reduces the overall number of treatment visits. When fabricating the provisional prosthesis, the clinician is able to visualize potential problem areas, such as screw access holes emerging in unfavorable sites, and change an abutment to improve the position of a screw access hole prior to making a final impression<sup>4</sup>. Patient preferences are noted, and correlations are made in the final prosthesis.

### IV. Conclusion

Studies and clinical experience have shown that immediate implant loading achieved similar success rates as those reported for traditional delayed implant approaches. Nevertheless, it is very important to know that, in order to achieve a high predictable success in immediate implant loading, a careful selection of cases, an adequate treatment plan, a good surgical technique and an adequate prosthetic design are essential. Immediate implant placement with immediate loading is an option that provides good treatment outcomes and allows good functional and esthetic results, as well as addressing the social/psychological aspects of trauma.

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