

## Single-Appointment Fabrication of Interim Immediate Denture: A Clinical Report

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### Abstract

**Objective:** An immediate complete denture is fabricated before the extraction of all teeth. It has several advantages such as preservation of esthetics, muscular tone, normal speech and reduction of post-operative pain. This report describes a method of using patient's current fixed partial denture (FPD) for single-appointment construction of interim immediate denture.

**Case:** We used patient's existing maxillary FPD for single-appointment fabrication of an interim immediate denture; which was delivered to the patient after the extraction of his remaining maxillary teeth.

**Conclusion:** Within a short time, an interim immediate denture can be fabricated for patients to preserve occlusion, vertical facial height and facial appearance until the fabrication of final prosthesis.

**Key words:** Conventional immediate denture, Complete denture, Fixed partial denture (FPD), Immediate denture, Interim immediate denture, Jiffy denture.

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### Introduction:

An immediate complete denture is fabricated before the extraction of all teeth (1). There are two types of immediate dentures: conventional immediate dentures and interim immediate dentures. In the conventional type, the interim prosthesis can be used as the patient's final denture after relining. The interim type is used for a short time after tooth extraction. Within this time period, the final denture is fabricated for the patient. However, considering the introduction and successful outcome of dental implants, fixed or removable implant-retained dentures are preferred as the final treatment of edentulous or partially edentulous patients. Interim immediate dentures are used for esthetic purposes, occlusal support and mastication for a short time period after tooth extraction (2). They have several advantages in terms of preservation of facial appearance, muscular tone, facial

height, size of tongue, normal speech and reduction of post-operative (post-extraction) pain (3). After the completion of recovery period, the immediate denture may be relined or replaced with the newly fabricated final denture (4). Maintaining the occlusal vertical height and centric relation/occlusion with the currently available occlusal contacts and cusp slopes is very helpful especially when we do not want the patient's appearance to be changed (2).

Several techniques have been proposed for the fabrication of immediate or transitional dentures and reduction of their fabrication time (5-7). Raczka and Esposito (1995) fabricated an immediate denture with the use of patient's current prosthesis and called it "Jiffy denture" (5). Jiffy means immediate and quick and Jiffy denture is a type of immediate denture that is fabricated quickly in the least time possible. Kahn and Haeberle (1992) described one-appointment construction of immediate

transitional complete denture using auto-polymerizing acrylic resin, tooth-colored acrylic resin and light-cured resin (8). Fabrication of Jiffy denture as a cost-effective technique has also been reported using a vacuum-forming machine without the need for conventional laboratory techniques (9).

Our present report describes a technique for fabrication of interim immediate denture with the use of patient's current FPD within a single appointment to preserve patient's facial appearance, muscular tone, facial vertical height and occlusion during the course of recovery following tooth extraction.

### Case:

A 54 year-old man presented to the Prosthodontics Department of Shahid Beheshti University, School of Dentistry complaining of severe mobility of his maxillary FPD and pain in the abutment teeth. The patient had a 12-unit maxillary FPD from the right first molar to the left first molar teeth. The abutments were canine and first and second premolar teeth in the left side and first and second premolars in the right side of maxilla. The two posterior molar teeth had cantilever design (Figure 1).



Figure 1- Intraoral view (maximum intercuspation)

In the mandible, the patient had an 8-unit FPD from the left first premolar to the right first premolar teeth with canines and first premolars of both sides as the abutments. Right second premolar of the patient had not been restored and

had a mesial caries (Figure 1).

The patient's maxillary FPD had 2-3 mm buccolingual and 1mm mesiodistal mobility due to the dissolution of cement and development of caries in the abutments. Panoramic radiograph revealed periapical lesions around the apices of the first premolar roots at both sides along with severe horizontal bone loss around the right second premolar. Extensive caries were also detected in all abutments in the left side (Figure2).



Figure 2- Patient's panoramic radiograph

Mobility of the maxillary FPD was due to severe extensive caries in the left canine and first and second premolars as well as the dissolution of cement. For further assessment of abutments, we had to remove the maxillary FPD. On the other hand, due to the type of occupation of the patient, esthetics and facial appearance were extremely important and thus, we had to provide him with an interim denture at the soonest time possible. Therefore, we decided to use the patient's current FPD for the fabrication of an interim immediate denture. However, the question was whether the temporary denture had to be fabricated as an overdenture on the abutments or as a complete temporary denture and the answer to this question depended on the prognosis of the abutments.

The patient's mandibular teeth required treatment as well. But since the patient had no complaint in this respect, treatment of mandibular teeth was postponed for later and after the delivery of maxillary denture. Treatment of maxillary teeth was continued as follows:

A suitable dentulous maxillary stock tray was selected and its borders were molded using bidding wax (DeTrey Division, Dentsply, England). Then, an alginate impression (Tropicalgin, Zhermack, Italy) was made from the maxillary arch using the border molded tray. Patient's maxillary FPD was removed using a crown remover (Figure 3) and placed inside the impression at its respective location (Figure 4).



**Figure 3- The removed FPD**



**Figure 4-The removed FPD was placed into the impression at its respective location**

The impression was then poured with type III dental stone (Hinritz stone, Ernst Hinrichs GmbH, Germany) and the cast was prepared (Figure 5).

The patient was referred to the Radiology Department to obtain periapical radiographs from the abutment teeth for their further evaluation and determination of their prognosis. Assessment of PA radiographs and periodontal

and endodontic consultations revealed that the patient's remaining teeth had poor prognosis. Thus, the remaining teeth had to be extracted and an interim immediate denture needed to be fabricated and delivered to the patient at the same session.

The patient was referred to the Surgical Department for extraction of the remaining maxillary teeth. At the same time, fabrication of interim immediate denture was started.



**Figure 5- Prepared cast**



**Figure 6- Periapical radiographs**

The prepared cast was waxed up and buccal and labial vestibules and the palatal surface were

filled and covered with red dental wax (DeTrey Division, Dentsply, England) similar to what is done for complete denture base. An index was taken from the entire surface of the waxed up cast using laboratory putty (Activator lab-putty, Coltene, USA (Figure 7). Due to time limitation, putty index was used instead of flasking. At the time of pouring the impression, dental stone penetrated into the FPD retainers; thus, the FPD was completely fixed to the cast and as a result, polymerization shrinkage of the acrylic resin base could not change the prosthesis-cast relationship. Therefore, occlusion and vertical height were easily maintained. The entire wax was then washed off the cast using boiling water. Powder and liquid (monomer) of auto polymerizing acrylic resin were mixed and spread over the cast at areas previously covered with wax. Putty index was then placed over the cast and slightly pressured in order to seat completely on its respective location. The complex of cast and putty index was fixed with an elastic band to stabilize the index on its respective location on the cast.



**Figure 7- Putty index**

The complex was then transferred to a pressure pot with 2 bar pressure equal to 30 PSI for complete setting of the acrylic resin and prevention of voids. After 20 min, the complex of cast and index was removed from the pressure pot. Index was removed and the cast was cut from the prosthesis base to separate the acrylic resin base along with the attached FPD. Penetration of acrylic resin into the gingival embrasures of the FPD caused attachment between the FPD and acrylic base. Due to polymerization shrinkage, in some areas the acrylic resin had been separated from the FPD margins. Since the FPD was fixed on the cast, the relationship of FPD and cast had not been changed. The obtained complex looked like a complete denture with the teeth that were actually the patient's FPD and underwent finishing and polishing procedures just like a conventional complete denture (Figure 8).



**Figure 8- Tissue surface of denture**

At this time, patient's remaining maxillary teeth had been extracted and bleeding had been controlled without applying sutures. Auto polymerizing acrylic resin (GC Hard, Tokyo, Japan) was used to enhance the attachment of FPD to denture base, eliminate the gaps between the acrylic base and FPD and improve the fit between the tooth extraction sites and the tissue surface of denture. After mixing the powder and liquid, acrylic resin was poured into the retainers of the FPD and below the pontics. Once the consistency of the resin increased and its glossy surface turned opaque, the denture was placed

into the mouth to get the impression of tissue. Before the acrylic resin started to heat up, denture was removed from the mouth to allow the complete polymerization to occur outside the oral cavity. Acrylic resin tags penetrated into the tooth sockets were cut with a bur to reach the level of tissue around the sockets (Figure 9).



**Figure 9-** Denture was relined with auto-polymerizing acrylic resin

In order to increase the fit between the denture and the underlying tissue and not injuring the extraction sites, 1 mm of the denture's internal surface was scraped and the denture was relined with tissue conditioner (GC tissue conditioner, GC Corporation, Japan) using the closed mouth technique (Figure 10).



**Figure 10-** Denture after final relining with tissue conditioner

The patient was recalled at 24 and 48 hours and one week for the follow up and maintenance care. The patient had no pain or discomfort and was completely satisfied with the denture and his appearance. Oral hygiene control was highly

emphasized in these sessions. At the end of first week, temporary lining material was replaced with a permanent one (Coe-Soft, GC Corporation) using closed-mouth impression technique. By doing so, during the recovery time, the patient was using his immediate denture till the fabrication of his final denture.

The patient was informed that he had to show up for his final maxillary and mandibular treatments within the next 1-3 months.



**Figure 11-** Denture in patient's mouth

### Discussion:

One major advantage of the described technique is that the tissue fit of denture is achieved inside the oral cavity by relining. Other techniques mostly require removal of teeth on the cast (10) to make room for the placement of artificial teeth (elimination of teeth on the cast and their replacement with artificial teeth). In the described technique, there is no need for elimination of teeth on the cast and tissue fit is directly achieved by intraoral relining of denture.

Presence of metal frame of FPD strengthens the denture base in this method. FPD metal frame in cases with natural teeth or FPDs in the corresponding jaw can strengthen the denture against the forces applied by the teeth in the corresponding arch.

In order to increase retention between the acrylic base and FPD, use of micromechanical retention may be beneficial. The porcelain may be etched with 10% HF acid where in contact with acrylic

resin. Then, a micromechanical bond can be created between the acrylic resin and porcelain using silane and bonding agent. Also, the retention may be increased by creating retentive macro-grooves by diamond burs in porcelain and metal where in contact with acrylic resin. In our case, none of the mentioned techniques were used to strengthen the attachment between the resin base and FPD and after 2 months, no separation was noted between the two. In fact, penetration of acrylic resin tags into the FPD retainers in the primary relined phase with autopolymerizing acrylic resin caused a strong bond between the two materials.

However, it should be noted that this treatment modality might be used when the majority of patient's teeth are reconstructed with FPD. Furthermore, the mentioned FPDs should have

acceptable esthetics and function in order to be used for the fabrication of interim immediate denture.

### **Conclusion:**

An interim immediate denture can preserve the patient's appearance, muscular tone, facial height, size of tongue and normal speech and reduce pain following tooth extraction surgery. If the patient meets the necessary conditions for the fabrication of this type of immediate denture (the majority of teeth are reconstructed with FPD or removable partial denture), it can be fabricated within a short time for the patient.

**Conflict of Interest: "None Declared"**

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