

# Immediate Complete Denture

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## Summary

*An immediate complete denture is a restoration for lost natural teeth and associated tissues, which is inserted into the patient's mouth immediately following the extraction of the remaining teeth.*

*The purpose of the paper is to draw the dentist/practitioner's attention to the need for immediate complete denture fabrication. The aims, advantages and disadvantages of immediate dentures as well as contraindications are described in detail.*

*Modern procedures for immediate complete denture fabrication as well as instructions to patients about wearing the denture and mouth and denture hygiene are given.*

*A need for a timely rebasing of immediate dentures and adjustment of the occlusion is also pointed out. The functional, aesthetic and psychological success of immediate dentures depends on correct indication, diagnosis, treatment planning and precisely executed fabrication procedures.*

**Key words:** *fabrication procedures, immediate complete denture.*

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Acta Stomat Croat  
2001; 281-285

## CASE REPORT

Received: January 18, 2001

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## Introduction

An immediate complete denture is a restoration fabricated prior to the extraction of a tooth, which is placed in the patient's mouth immediately following the removal of the remaining teeth (1,2). Man has always felt the need for replacing lost teeth. Many years ago the dental profession recognised and accepted patients' wish and need to avoid an edentulous period, which resulted in fabrication of dentures that can be placed in the patient's mouth immediately following the removal of the last natural teeth, mainly anterior teeth (3,4,5). Today dentists are expected to construct immediate dentures, and patients ask for them increasingly, mainly for

aesthetic and psychological reasons. The success of immediate dentures depends on correct indication and precise execution of clinical and laboratory fabrication procedures. Although patients may have many difficulties in the first year of their immediate denture wearing, the majority of patients are generally satisfied (6).

## Advantages of immediate dentures

The presence of natural teeth in the patient's mouth during fabrication of immediate dentures enables selection of artificial teeth of a corresponding size, shape and shade and their placement to

the site where natural teeth were. In this way the patient's original appearance can be restored. If the patient's remaining teeth provide a correct vertical and horizontal relationship between the mandible and maxilla, a continuous and correct habitual function can be achieved, which facilitates mastication, deglutition and speech. However it must be kept in mind that the remaining natural teeth do not always provide accurate vertical dimension that can unconditionally be used in fabrication of immediate dentures. Although natural teeth help in the arrangement of artificial teeth, reproduction of their position is not always desirable. The position and appearance of the preserved natural teeth is often not satisfactory. Placement of artificial teeth can change this and thus improve the patient's appearance.

An immediate denture has therapeutic and prophylactic impact. It is used as a bandage for extraction wounds: it prevents bleeding, protects the wound against trauma, prevents the entrance of food and liquid into the wound, protects blood clots and accelerates healing, and it also enables a more correct formation of the residual ridge. All the functions are facilitated because the tongue, lips and cheeks do not change their position, since the denture serves as a support for them. It is easier for patients to decide upon having to carry on their bad teeth extracted when they are aware that they will get an immediate denture enabling them their business and social affairs without hindrance.

### **Disadvantages of immediate dentures**

The procedure of immediate denture fabrication lasts longer and more sittings are required, especially during the stage of the patient's adaptation to the denture. An immediate denture can also be a traumatic transition to a complete denture if the patient is not fully informed about the complexity of the clinical and laboratory procedures, the necessary care of the dentures, and additional costs in connection with immediate denture fabrication (7). Bone resorption after tooth extraction is often accelerated, and changes in soft tissues also occur. These changes are individual and do not occur with the same intensity. Changes in the tissues of the denture foundation lead to a weaker retention of the denture in the denture foundation. New impressions and

rebasings are needed in order to improve adaptation of tissues as well as retention and stabilisation of the denture. After each rebasing the denture should be placed back into the articulator and the occlusion adjusted. The impossibility of examining the arrangement of the anterior teeth in the patient's mouth in order to check the appearance, leads to difficulty.

### **History, examination and diagnosis**

Prior to making a final decision on immediate denture fabrication it is necessary to collect more detailed information from the patient about his/her general health. If the patient is ill, it is necessary to know whether he is in treatment and which medication he takes. If a severe disease is in question, it is necessary to consult the patient's doctor about whether the patient can undergo procedures of immediate denture fabrication. It is important to identify the patient's expectations and to explain to him/her limitations and possibilities of fabrication of aesthetic and functional satisfactory restorations. An immediate denture can replace one tooth, several teeth or all teeth in one or in both jaws. Sometimes it is necessary to hospitalise the patient in order to carry out preoperative and postoperative procedures more easily and safely.

A detailed extraoral and intraoral examination is the basis for correct diagnosis, indication and treatment planning. Inspection, palpation and radiological examination help in assessment of the state of soft tissues, periodontium of the remaining teeth, bones, temporomandibular joints and muscles.

It is especially useful to collect and store data on the patient's teeth. In this way information about the shape, size, colour and position of teeth, as well as about the vertical and horizontal relations of the lower and upper jaw can be obtained. The patient's natural teeth, diagnostic casts, old dentures and photos are the most helpful (8).

### **Contraindications**

Fabrication of immediate complete dentures is contraindicated in persons who undergo radiotherapy in the head and neck area. Immediate dentures are not constructed or they are constructed with

special care in patients with a heart defect, systemic disease, dysfunction of glands, blood coagulation disorder, difficult wound healing and disturbed tissue regeneration. Elderly and ill persons find it difficult to endure extraction of more teeth at the same sitting and special care should be given to them. Mentally disturbed persons and persons with limited mental ability are neither able to cooperate nor to take care of the dentures and their hygiene. Immediate denture fabrication is not recommended when a surgical correction of disturbed interarch relationships is needed or when a bad position of a tooth requires extensive reduction of the residual ridge.

### Preparation of the mouth

If the patient has preserved lateral teeth that need to be extracted, it is best to take an impression of both jaws before the extraction of teeth and to fabricate casts (Fig. 1). For a better insight into interarch relationships it is best to translate the casts to the articulator by means of face-bow (Fig. 2a and b). It is necessary to extract the lateral teeth 4 to 6 weeks before the beginning of immediate denture fabrication. The construction of a transitional denture for the patient that will replace the extracted lateral teeth is desirable. A transitional partial denture assures function, facilitates the transition and helps a more speedy adaptation of the patient to his complete denture. It is advisable to preserve the first premolars that keep the correct vertical occlusal dimension. The remaining teeth must be treated periodontically and possible inflammation must be cured.

### First impression

The first impression is most often taken in alginate or some other rubber material in a stock tray (Fig. 3). The line of vibration, foveae palatinae and hamular notch are marked with an indelible pencil. A custom tray is made on the cast obtained in the first impression, which will be used for taking a functional impression and precise positioning of the denture borders. It is advisable to make two casts: one for fabrication of a custom tray and the other as a diagnostic cast.

### Custom tray fabrication

A custom tray is most often fabricated in cold polymerising acrylic resin. The cast is coated with a separating agent and the remaining teeth, residual ridges and palatal portion are covered with a 0.5 mm thick layer of pink wax. A mix of self polymerising acrylic resin is applied to the cast. The borders of the custom tray must go round the mucosa and end 2 to 3 mm below the marginal zone. The tray is fabricated in three ways.

1. - A custom tray is fabricated to cover all teeth (Fig. 4).

2. - A custom tray covers the residual ridges and palate, and its front border ends in the middle of the palatal surfaces of the anterior teeth (Fig. 5).

3. - A custom tray does not cover the remaining teeth, but it has a labial flange (Fig. 6). The borders of the tray are marked with a pencil on the cast in order to extend into the labial vestibule. A line is marked in the vestibule 3 to 4 mm away from the gingival margin.

### Methods of functional impression

Functional impression is most often fabricated in a rubber material or paste with a zinc oxide base. The impression is taken in one phase, two phases or combined. A one-phase method of the functional impression is not recommended because of its insufficient precision.

In a two-phase impression the borders are formed in a thermoplastic or rubber material. The impression of the denture foundation is mainly taken in rubber materials because they are easily removed from the mouth without deformation, but care should be taken with loose teeth and undercuts.

A combined impression method. The borders of the tray are formed in a thermoplastic material or elastomer, and then an impression of the denture foundation is taken. Melted aluminium wax is applied 5 mm in width to the posterior border of the impression, and the tray is repositioned in the mouth. At the end a final impression is taken in alginate by means of a stock tray that should be large enough to cover the custom tray (Fig. 7a and b).

### Determination of interarch relationships

Interarch relationships are determined by means of trial bases constructed on the master cast. The trial base should cover the denture foundation and press against the remaining teeth. For a better retention clasps can be placed onto a trial base. The transfer of the upper jaw cast to the articulator is carried out in the usual manner. The horizontal interarch relationship is determined by centric record.

### Selection and placement of artificial teeth

The remaining natural teeth facilitate the selection of artificial teeth. The same rules apply for placement of teeth on immediate dentures as for complete denture fabrication (9). Artificial teeth are placed approximately on the sites where the natural teeth were. The lateral teeth are placed first, which are placed in centric occlusion in relation to the record after the casts have been placed in the articulator. Accuracy of the certain centric relation and arrangement of the lateral teeth is checked in the patient's mouth. The anterior teeth are placed afterwards, in the sites where natural teeth were unless their position needs to be corrected. Before the teeth are removed from the master cast a soft pencil is used to mark the line on the gingival margin from the vestibular and oral side (Fig. 8). If the remaining teeth have deep periodontal pockets, the depth of the pockets is measured and marked on the cast. With a small saw for plaster, mounted stone or steel bur the plaster teeth are knocked off up to the gingival margin (Fig. 9). The teeth are eliminated one by one and on their site a corresponding artificial tooth is placed. The teeth which moved or changed their position should be eliminated first. Deep etching and making of pseudoalveoli on the site of the anterior teeth or scraping of the vestibular wall is not recommended. If the pockets are deep, the vestibular wall can be scraped below the marked depth of the pockets, 2 to 3 mm in depth. The aim is to preserve as much bony tissue as possible. It is not possible to check the arrangement of the anterior teeth in the patient's mouth. After all teeth have been placed, the denture is prepared, inserted into the flask and polymerised.

### Surgical procedure

After the immediate complete denture is polymerised, processed and polished, the remaining anterior teeth are extracted. If a smaller number of teeth is extracted, it is sufficient to compress the extraction alveoli with the fingers, using sterile gauze. When several teeth are extracted, it is best to make situation stitches (Fig. 10). Very pronounced interdental or interradicular septa should be carefully reduced, preserving the bony tissue.

### Handing in of dentures and instructions to the patient

The dentist should inspect carefully the immediate denture finished in the laboratory, especially from the tissue side. All sharp spots should be eliminated with a bur. The aesthetic appearance, as well as vertical and occlusal relationships are checked in the patient's mouth (Fig. 11a and b). Before it is placed in the patient's mouth, the denture is cleaned with soap and water, and it is emersed in an antiseptic solution for an hour. The aesthetic appearance, height of occlusion and horizontal relation are checked. A paste with a zinc oxide base or antibiotic or sulfonamide powder is applied to the inner surface of the denture on the sites where teeth were extracted, and are not allowed to enter the extraction wound. The patient is asked to keep the denture in the mouth for the first 24 hours due to postextraction edema that can cause difficulty in placing the denture back in the mouth. The patient is advised not to remove the denture for the first 3 or 4 days. Then the denture should be taken out of the mouth for 4 to 8 hours a day. Instructions about mouth and denture hygiene are given to the patient. The agents applied to the inner side of the denture remain until the soft tissues are healed. After the healing of the extraction wounds is completed, the medicament bandage is removed and a self polymerising acrylic resin is applied in its place.

When the denture is handed in the occlusion is refined by grinding, and more extensive grinding is carried out three weeks after the denture was handed in. The first extensive rebasing is performed after three months, and the second after another three

months of wearing the denture. After 10 to 14 months the denture is made permanent by rebasing.

Check up is performed at least once a year. The immediate denture is considered as permanent when it is rebased after 3 to 6 months. This means that during immediate denture fabrication it is necessary to take care of all the details in connection with retention, occlusion, aesthetics and comfort of the denture (10). A new denture, if necessary, is fabricated after 2 years.

### Conclusions

Functional, aesthetic and psychological reasons justify fabrication of immediate complete dentures

wherever possible. The success of immediate complete dentures greatly depends on a correct diagnosis, detailed treatment planning and precise execution of fabrication procedures. A correct diagnosis and work plan can be made only after gaining insight into the patient's general health and detailed extraoral and intraoral examination. Prior to the beginning of the treatment the patient should be introduced to the plan, advantages of an immediate denture and possible difficulties. In this way acceptance and cooperation of the patient is assured. When making a final decision it is necessary to consider possible contraindications. With due care in preparation, immediate dentures can be recommended and fabricated in the majority of patients who request them.