

# Single-Appointment Fabrication of a Transitional Complete Denture: A Case Report

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## Abstract

Today's patients insist that the transition phase from dentulous to edentulous should be as brief as possible, with minimal changes to facial appearance, speech, and masticatory function.

Conceiving a transitional denture, from an "additive" or "convertible" existing partial removable prosthesis to which teeth are incorporated following extraction of the last remaining teeth, satisfies completely all of these requirements of ensuring a replacement solution that minimize discomfort and time wasted, and contributes to the preservation of the ridges.

The technique for constructing transitional prostheses requires a single appointment to make an adequate impression and provide technical work in the dental laboratory before proceeding with tooth extraction. A definitive prosthesis must be planned after post extraction tissue changes have occurred.

**Keywords:** Transitional denture, edentulous, removable partial denture, esthetics, tooth extraction

## Introduction

The ageing population is a global phenomenon and recent demographic and epidemiological researches indicate a decline in the prevalence of edentulism.<sup>(1)</sup>

When confronted with the possibility of losing their remaining teeth, patients may experience a feeling of panic. According to them, the loss of their final remaining teeth and the transition from the dentate or partially dentate situation to total edentulism is a psychologically challenging experience because they are unable to endure the typical 6 to 10 week waiting period for their "gums to heal", that receiving the final, permanent prosthesis. Dentists must facilitate

this transition from natural teeth to complete removable dentures (CRD).<sup>(2-4)</sup>

Despite the notable advancement in prosthetic procedures and the emergence of reliable dental implant solutions, transitional prostheses continue to be an important treatment approach in modern dentistry, assisting patients to transition from a removable partial denture (RPD) to a CRD.<sup>(5)</sup>

In fact, transitional complete denture (TCD) is an interim prosthesis fabricated from existing RPD to which artificial teeth are added when all of the remaining natural teeth are extracted and replaced.<sup>(1,6)</sup>

It is designed to improve, provisionally, esthetics, stabilization and/or function while



tissue healing or related treatment is provided, followed by a definitive denture. Their fabrication and use must be incorporated into a total prosthodontic treatment plan.<sup>(7,8)</sup>

This alternative is indicated when the esthetic requirements of the existing RPD are acceptable and the maxillomandibular relationships are satisfactory, for patients with severe periodontal disease who must lose their teeth, and eliminates many complicated procedures and prolonged timetable that are necessary for other treatment modalities such as immediate dentures.<sup>(2,3,6)</sup>

This clinical report aims to describe a practical and expeditious single-appointment technique of transforming an existing RPD into a complete interim prosthesis in a way that minimizes any disruption for the patient.

## Case Report

A 62-year-old vendor, presenting with systemic diseases of hypertension and diabetes, actively involved in his small business and social life, consulted the prosthodontic department looking to replace the upper anterior teeth. No matter which treatment approach is selected, the patient had made it clear he did not want to leave the dental office without having their upper teeth in place.

The patient had a severe periodontal problem involving his remaining mobile teeth and residual roots. Radiographically, all of the maxillary teeth showed a significant loss of 50% to 80% of their vertical bone height with periapical lesions. (Figures 1a-1b)

He presented with a maxillary partial denture with bordering teeth 12 and 24, crowned by defective metal-resin fixed single prostheses following a fracture of the coronal part of the abutment teeth. (Figures 1c-1d)

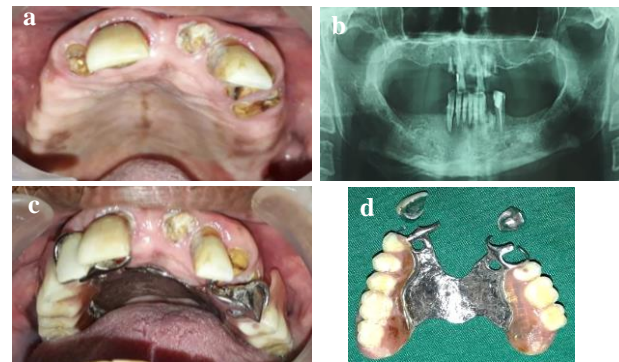


Figure 1: Preoperative situation. a: Remaining maxillary teeth; b: radiographic view; c,d: existing prosthetic restorations

After clinical and radiographic examination, and depending on the financial considerations of the patient, the therapeutic alternatives were analyzed with the patient. The final treatment plan included extraction of all remaining unrestorable maxillary teeth and transformation of the current RPD into the construction of a TCD to be placed immediately after teeth extraction in the same appointment.

The mobile teeth have been coated with a light thickness of petroleum jelly (Vaseline®) to prevent extraction while making an impression. (Figure 2a) The upper impression was made with the RPD in situ, using an irreversible hydrocolloid in a stock tray with the borders modified with soft periphery wax. It was recommended to thoroughly record the teeth identified for extraction, the surrounding soft tissue anatomy, the anterior buccal vestibule, the vibrating line and the posterior palatal seal area. (Figure 2b) The impression was poured with type III dental gypsum material to relate the prosthesis to the cast. (Figure 2c)

The cast modification or trimming, done where teeth were extracted, was required to fit denture base to postoperative bearing surfaces. In the first phase, teeth were removed from the cast by trimming dental areas that extended past the gum line (gingival margins) towards the biting edges (incisal surfaces) using the saw or a pair of pliers.



Figure 2: maxillary impression. a: teeth coating with a thin layer of petroleum jelly; b: impression RPD in place; c: suitable dental cast

In the second step, a powered rotary dental instrument, such as a laboratory handpiece and an appropriate bur, was used to connect the lingual gingival line to the front surface. The stone contours were gently rounded by scraping the trimmed areas with a sharp knife or bladed instrument. (Figure 3a)

The retentive arm of the clasps was removed to ensure a better fit of the entire prosthesis on the rectified cast. (Figures 3b-3c)

Artificial teeth, selected according to the shape of the residual teeth, were placed in the appropriate positions. The gum line edges were precisely sculpted and defined along the front and lingual areas. The wax was extended to complete the anterior borders of the denture. (Figure 3d)

A plaster index was made overall mounted teeth and the wax surrounding them to retain their position during resin polymerization and adjust the thickness of the base. (Figure 3e)

Once the wax had been removed, the teeth were repositioned on their plaster index impressions and retentive undercuts were made in their bases. (Figure 3f)

Complete palatal coverage was required. For this reason, the posterior portion of the cast should be shaped to create the retention-enhancing posterior palatal seal. This also accounts for the

dimensional changes occurred due to the acrylic resin polymerization. (Figure 3g)

Making macro undercuts, grooves and holes in connecting areas of the new base and the remaining resin and metal frame of the partial denture aimed to improve the mechanical retention and prepare the existing prosthesis to receive the new resin. (Figure 3h)

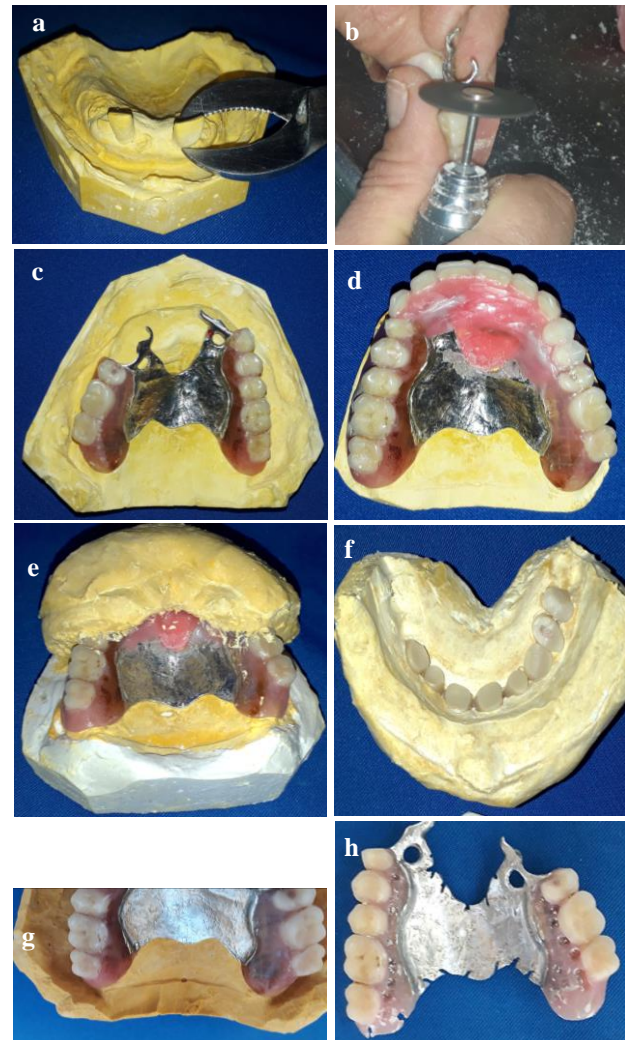


Figure 3: cast and denture preparation. a: teeth removing; b: clasps reduction; c: RPD adapted to the modified cast; d: Anterior teeth arrangement; e: Plaster index; f: teeth preparation; g: post dam scraping; h: mechanical retention

The denture was fixed on the cast. So, during the acrylic resin curing process, it did not shift from its positioned placement. This ensured that the final bite alignment and occlusal relationship

between the upper and lower teeth were not disrupted in any way.

After eliminating the wax and spreading the separator on the plaster surfaces, self-curing acrylic resin was prepared and applied over the whole tissue surface of the cast (existing denture in place) at a fine thickness. The plaster index was positioned over the denture and the model. After removing the surplus, this assembly was placed inside a pressure pot under 30 psi pressure for 20 minutes.

Once acrylic was curing, the denture was removed from the cast, trimmed, finished, and polished following the same standard procedures as a conventionally fabricated denture. Any asperity with the bearing surface and extreme undercuts in the finished denture were removed before it was placed in the patient's oral cavity. (Figures 4a-4b)

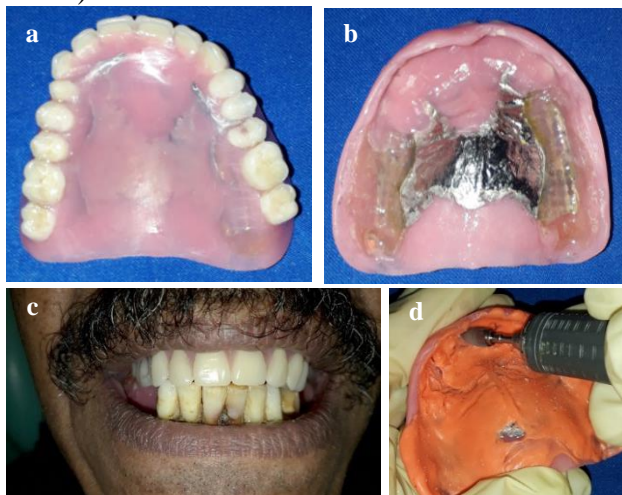


Figure 4: Treatment results. a,b: The finished maxillary converted removable denture; c: Final transitional complete denture in place and patient smile; d: final denture base adjustments in pressure area

During the laboratory procedure, the patient's remaining teeth and fixed denture abutments had been extracted with minimum trauma, and bleeding had been controlled.

The final adaptation of the denture base to the area of extraction was evaluated during the chairside stage. The occlusion was controlled before the patient's departure. (Figure 4c)

The prosthesis was delivered to the patient with conventional postoperative directives. He should keep the denture in place during the initial 24 hours. Afterward, he was instructed to clean the prosthesis at a minimum of once per day and to remove it overnight to allow the oral tissues time to recover from the diurnal pressures of wearing a denture. His follow-up appointments were scheduled for 24 hours, 72 hours, and 1 week after the initial denture delivery. These appointments allowed for any necessary final denture base adjustments, such as relieving areas of excess pressure on the tissues and occlusal refinements. (Figure 4d)

## Discussion

Payne has described the transitional prosthesis as "the best solution of modern dentistry for one of our greatest problems, the too busy individual with the too loose teeth".<sup>(2)</sup> In fact, the loss of the patient's final remaining teeth is an emotionally challenging experience that leads to changes in facial appearance, chewing difficulties, ambiguous speaking and a deterioration in the quality of life, particularly in cases where an extended healing period is required.<sup>(1)</sup> Consequently, it is essential to reduce the alterations and aid the patient in overcoming the challenges related to his or her edentulism, by suggesting a sequential transitional approach.<sup>(1)</sup> The process of converting an all-acrylic resin or metal/acrylic resin RPD into a CRD is valuable, because it helps patients to adapt to the edentulous condition.<sup>(4)</sup>

The color, position, and shape of the final remaining natural teeth can be closely replicated in a transitional denture, as well as the maxillomandibular jaw relationships.<sup>(9)</sup>

Simulation of the post-extraction situation requires a few adjustments to be performed on the model obtained from casting the impression made with the existing RPD in the mouth. Modification intends to create space for the placement of artificial teeth.<sup>(5)</sup> The practitioner must prepare the cast. The bulging shape of the alveolar ridges is preserved, and excessive plaster is meticulously eliminated to the gingival

margins using a sharp scalpel. It is important to avoid excessive trimming to ensure a passive fit of the prosthesis. Additionally, all line angles should be rounded.<sup>(9)</sup> Over sculpting of the cast can lead to compression of mucosal tissue while primary insertion of the resultant denture. As mentioned before, this may require bone reshaping, relief of the prosthesis's inner surfaces, or both. Inadequate adjustments often lead to insufficient fitting of the denture base.<sup>(5)</sup> All the teeth are extracted concomitantly, with a gentle and delicate technique, ensuring regular healing, and transitional denture is inserted directly afterward. The surgical procedure emphasizes the importance of a conservative and non-traumatic approach.<sup>(9)</sup> The healing process of the surgical area following tooth extraction requires a prolonged healing duration. To enhance retention and stability, compensate for any variations in the adaptation of the transitional prosthesis and condition the mucosa ensuring comfort for the patient, resilient soft relines or tissue-conditioning materials may be applied.<sup>(7)</sup> The patient may experience varying levels of pain and some discomfort may occur for some days after the extraction and adjustments will likely be acquired. Therefore, it is advisable to schedule definite appointments to examine the patient on the day following placement, then continue with frequent follow-up visits for the first few weeks to address any needed adjustments before more substantial issues develop.<sup>(9)</sup>

The conversion of RPD to a TCD offers numerous benefits. These include a simple procedure, surgical site protection resulting in a faster healing process, minimal disruption of the oral and perioral musculature, preservation of appearance, restoration of the vertical dimension of occlusion and centric relation, the possibility to relines the RCD during follow-up appointments, a smooth transition to a definitive denture, and a relatively affordable procedure.<sup>(9,10)</sup> This approach allows the clinician to furnish the patient with a transitional prosthesis during a single appointment, removing

the need for the standard wax try-in session as well as the subsequent time required at the dental laboratory for fabrication and finalization.<sup>(11)</sup>

The disadvantages of this conversion encompass potential issues such as inadequate retention, the need for possible relines, as well as the mass and heftiness of the denture due to the weight and size of the partial prosthesis.<sup>(10)</sup>

After the healing phase, the clinician can then proceed to fabricate the permanent prosthetic using the standard technique, thereby maintaining control over the esthetic outcome and the adaptation.<sup>(4)</sup>

## Conclusion

In the contemporary fast-paced world of business and social commitments, transitional procedures play an important role in ensuring the smooth change from the dentate to the edentate situation. This transition period remains necessary even when implant-retained prostheses are planned. Effective clinical decision-making is crucial and the result of a successful therapeutic approach is contingent on the result as well as the method used to accomplish it.

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