

## **Aesthetic Rehabilitation of a Patient with Maxillary Protrusion and High Smile Line Using Flangeless Tooth Supported Overdenture**

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### **ABSTRACT**

Complete loss of teeth can be a distressing experience for an individual, as it can lower their confidence and serve as an unspoken sign of aging. An overdenture is a complete denture supported by both soft tissue and a few remaining natural teeth. This case report describes an approach for managing a patient with extremely mutilated dentition who had a partially edentulous maxillary arch and a completely edentulous mandibular arch. The patient's right maxillary canine and left second premolar were preserved, resulting in a prominent premaxillary undercut. This rehabilitation

was successfully done using a flangeless maxillary overdenture, which provided enhanced esthetics without compromising function

### **Keywords**

Flangeless Overdenture, Rhein OT strategy, Tooth supported attachment.

### **INTRODUCTION**

Tooth-supported overdentures are a popular and cost-effective treatment option that offers better retention and reduces the rate of bone resorption than conventional complete dentures[1]. However, there

are massive challenges that clinicians may face when using this approach. Often while preserving teeth in the premaxilla, it may lead to hard tissue undercuts. In some cases, the denture flange can bulge too far buccally, potentially affecting muscles of facial expression, restricting function and negatively impacting the patient's overall appearance[2].

Pre-prosthetic surgery is an option to eliminate undesirable undercuts before constructing a complete denture. However, it may not always be feasible for some patients due to lack of motivation or other contraindications. In such cases, a flangeless overdenture can be a valuable treatment option. This approach is simple, conservative and non-surgical, making it ideal for patients with bulky maxillary ridges who desire improved facial aesthetics[3].

This case report describes an approach for managing a

patient with extremely mutilated dentition who had a partially edentulous maxillary arch and a completely edentulous mandibular arch. The patient's right maxillary canine and left second premolar were preserved, resulting in a prominent premaxillary undercut. This rehabilitation was successfully done using a flangeless maxillary overdenture, which provided enhanced esthetics without compromising function[4].

## **CASE REPORT**

### **PHASE 1: DIAGNOSTIC PHASE**

A 57-year-old female patient presented to the Department of Prosthodontics with chief complaint of difficulty in chewing due to missing teeth. Extraoral examination revealed that the patient had a convex profile, ovoid tapering face and short lip length (Figure 1).



**Figure 1:** Pre-operative extra-oral profile

Intraoral examination revealed a U-shaped arch with a proclined anterior maxillary ridge and a severe labial

undercut. A faulty FPD from 14 to 23 was also present, along with generalized recession and mobility in the



**Figure 2:** Intra-oral examination showing faulty prosthesis

remaining maxillary teeth (Figure 2). The mandible was completely edentulous, with a history of teeth removal due to periodontal disease. Radiographic examination revealed

severe bone loss in relation to teeth 16, 14, 23, 24, 26 (Figure3).



**Figure 3:** OPG

Several treatment options were considered, including extraction of the remaining teeth followed by a conventional complete denture, implant-supported overdenture and tooth-supported overdenture. However, the patient rejected the implant-retained prosthesis due to the need for additional surgery, longer duration of treatment and related expenses. As a result, the decision was made to construct a mandibular conventional complete denture and a maxillary tooth-supported overdenture. The maxillary overdenture was fabricated with extra coronal ball

attachments on abutments and with metal base and made flangeless in the premaxillary region.

**PHASE 2: PRE-PROSTHETIC PHASE**

The faulty prosthesis was removed and after thorough clinical and radiographic assessment, it was decided to retain only teeth 13 and 24 for a tooth-supported overdenture, while the remaining teeth were prescribed for extraction. Preliminary impressions were made and diagnostic casts were mounted for further evaluation. Ball attachments were prescribed for 13 and 24, which underwent an intentional endodontic procedure (Figure 4 and 5).

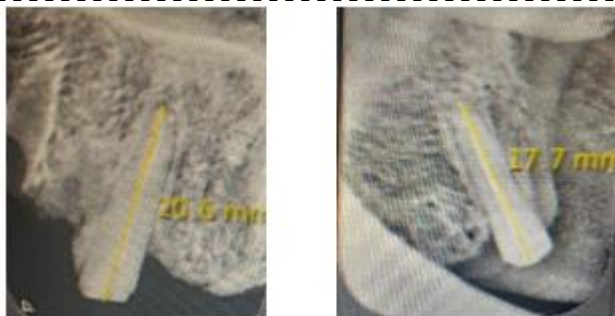


Figure 4 and 5: Endodontically treated 13 and 25

**PHASE 3: PROSTHETIC PHASE**

The endodontically treated teeth were prepared in a dome-shaped contour with approximately 3-4 mm tooth structure projecting above the gingiva.

Post space was prepared and a pickup impression was made using a custom tray and Addition silicone impression material (Figure 6), and was then poured with die stone.



Figure 6: Pickup impression of post space

The post-coping patterns were fabricated in the laboratory in wax and Rhein 83 OT strategy castable sphere micro size (Ref. 0555SCM Rhein 83

catalogue) was attached to the dome-shaped coping pattern (Figure 7 and 8).

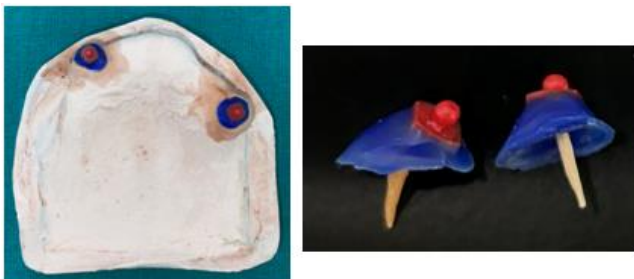


Figure 7 and 8: Post coping patterns attached with Rhein 83 OT strategy castable sphere micro size

Surveyor was used to obtain parallelism of the patterns and were then cast in Co-Cr alloy using conventional procedures.

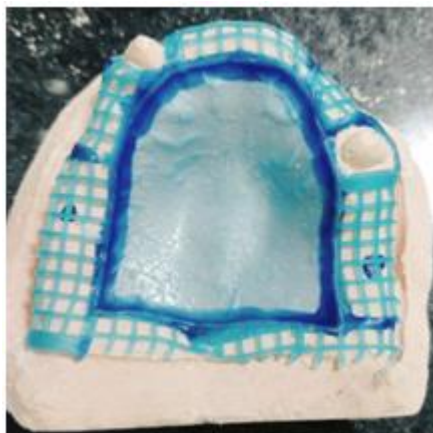
The copings with attachments were finished and polished and than luted to the abutment teeth using GIC luting cement (Figure 9).



**Figure 9:** Attachments luted to the abutment teeth using GIC luting cement

The maxillary secondary impression was made using a custom tray and border molding was done using low fusing green stick and a wash impression was made using light body material.

Next, a wax pattern was made for the metal framework of maxillary overdenture and casting was done (Figure 10).



**Figure 10:** wax pattern for the metal framework of maxillary overdenture

Try-in of metal framework was completed and occlusal rims were made. Facebow transfer and jaw relations were recorded and the denture base was made flangeless in the premaxillary region.

Teeth arrangement was done and a try-in was accomplished. Upon reviewing the patient's earlier photographs, it was noted that she had a gummy smile and a greater display of teeth. The fullness of the patient's upper lip was also evaluated to determine the



appropriate support required. The lip position was assessed both at rest and in function to ensure that it was comfortable and natural-looking for the patient. Accordingly the denture was waxed-up and processed using heat cure acrylic.

Vent holes were created in the maxillary denture corresponding to the location of attachments. A circular shaped piece of rubber dam sheet of 1 cm diameter was placed on the abutment to serve as

barrier to prevent acrylic from flowing on the surrounding abutment. The stainless-steel housing (micro size- Ref.041CAM Rhein 83 catalouge) with the clear cap (micro size standard retention-Ref.040CRM Rhein 83 catalouge) was attached to the ball attachment and was picked up by injecting autopolymerizing acrylic resin in the space while the patient occluded in centric relation (Figure 11).



**Figure 11:** The stainless-steel housing picked up by injecting autopolymerizing acrylic with the clear cap. The resin flash that came out of the vent holes was trimmed, finished and polished and final insertion was done (Figure 12 and Figure 13).



**Figure: 12** Denture insertions

**PHASE 4: MAINTAINENCE PHASE**

The patient was given instructions about insertion and removal, eating and speaking as well as maintenance of the denture. Periodic follow-up was carried out.



**Figure: 13** Post-operative extraoral profile

**DISCUSSION**

Complete loss of teeth can be a distressing experience for an individual, as it can lower their confidence and serve as an unspoken sign of aging. An overdenture is a complete denture supported by both soft tissue and a few remaining natural teeth. It is essential to assess the vertical space adequately while planning for overdentures to ensure that there is enough room for the attachments, along with a sufficient thickness of denture base material and artificial teeth, without compromising the denture's strength. In this patient the interarch space was evaluated using a diagnostic jaw relation. It was determined that there was sufficient space to use a ball attachment, which is a simpler and more cost-effective option that requires less work in the laboratory.

More often, we encounter labial/buccal undercut in relation to the retained abutment teeth. Placement and removal of the denture can be traumatic to the underlying mucosa in these undercut areas. The additional thickness of the flange may cause esthetic problems such as a swollen appearance of the lips. In the case where the retentive ball attachments are used, peripheral seal is not the primary mode of retention. A flangeless denture is a good option for the patient, as it eliminates the need for peripheral extension and maintaining the esthetics of lip.

**CONCLUSION**

Devan's Dictum states the aim of a prosthodontist is not only the meticulous replacement of what is missing, but also perpetual preservation of what is

present. The numerous benefits of the overdenture therapy justify its incorporation into the range of procedures accessible to every dentist. Apart from the evident enhancement in stability and retention, the addition of periodontal proprioception aids in avoiding occlusal overload. This could result in safeguarding the remaining tissues, which is a significant preventive aspect in prosthodontic therapy.

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