

# RESTORATION OF A FULLY EDENTULOUS PATIENT UTILIZING SIMPLE TECHNIQUES FOR IMPRESSION AND FABRICATION OF A HYBRID BRIDGE

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## ABSTRACT:

The first line of treatment of a fully edentulous patient is the fabrication of upper and lower complete dentures. There are many patients who cannot wear these dentures. The use of implant supported overdentures improves the patient satisfaction. However the use of dental implants to support a fixed prosthesis provides the optimal level of patient satisfaction. This article highlights simple techniques for the fabrication of a lower hybrid bridge and the use of locator attachments and an overdenture as a transitional phase. The techniques described are very cost effective and requires fewer patient appointments compared to traditional techniques.

**Keywords:** Dental Implants, Rehabilitation, Hybrid Bridge, Locator Attachments.

## INTRODUCTION:

Rehabilitation of a completely edentulous patient could be a long process including many dental visits. By utilizing certain techniques and materials, the cost and time of delivery time of the final prosthesis can be better managed. The use of an implant supported prosthesis in the management of a completely edentulous patient has been shown to be quite predictable.<sup>1,2</sup> Many completely edentulous patients are elderly or medically compromised therefore minimally invasive surgical techniques, reduced number and duration of appointments is critical.

## CASE DETAIL:

A 72 year old male presented with “uncomfortable dentures” and was interested in getting permanent teeth on the lower jaw.<sup>3</sup> The patient didn’t have any drug allergies or medical considerations. The patient had a set of upper and lower complete dentures which was 6 years old. The upper ridge was adequate for denture retention, however the lower ridge had severe atrophy posteriorly.

Radiographic evaluation in the form of a digital panoramic radiograph and ridge mapping indicated adequate height and width for mandibular root form implants in the anterior regions only. There was sufficient interocclusal space for an implant supported mandibular prosthesis

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and the decision was taken to use an upper complete denture and a hybrid implant supported denture on the mandible.<sup>4</sup>

For this hybrid prosthesis, five Zimmer Dental implants (Tapered screw vent) were selected and placed in the A, B, C, D, and E sites between the mental foramina.

Both upper and lower dentures were duplicated. This technique involved the use of a denture case, vaseline, impression material and resin acrylic. The denture was placed in 3M ESPE Express (Vinyl Polysiloxane Putty) which was in half of the denture case and vaseline placed on the denture and lower half of putty. More putty was placed over the denture and the case closed. The excess material was removed. The case was opened, the putty was separated and the denture removed. Bosworth Trim (Temporary Resin Acrylic) was placed in the space made by the denture and the case closed. The duplicate denture was removed after complete setting and trimmed. The lower denture was trimmed in the anterior lingual region to relief the region where implants would be placed.

A Ridge Mapping Caliper was used to determine the width of the anterior mandible. Manual palpation of the ridge was also done while viewing radiographs so as to confirm the best length and angulation of implants to be used. A flapless approach was used for implant placement. Initial preparation of the bone was made using the smallest internally irrigated spiral drill. The osteotomies were enlarged using a series of progressively larger internally irrigated burs. The final

diameter of the osteotomies were slightly smaller than that of the implants which were to be used. The sterile implants were placed into the sites as far as possible using finger pressure. The implants were seated to full depth utilizing a ratchet. The A & E implants (4.1mm x 11). The C implant was placed as far anteriorly as prosthetically possible to increase the anteroposterior spread. The B & D implants were placed equidistant between the others. These three implants (B,C,D) (3.7 X 11.5 mm). A torque wrench was used on the A and E implants to verify that a torque of 30Ncm was achieved.<sup>5</sup> The fixture mounts were adjusted to relieve the occlusal height and removal of the internal hex design. This adjustment of the internal hex ensured that the fixture mounts were non engaging. The 5 adjusted fixture mounts were placed onto the implants. The passive fit of the duplicate denture around the fixture mounts was verified. The duplicate upper denture was used as an upper tray. A Polyether Impression material (3 M ESPE IMPREGUM F) was used in the upper duplicate denture to get the upper impression for the fabrication of a new upper denture. Additional Resin acrylic (TRIM) was placed around the fixture mounts adjacent to the lower duplicate denture. Cotton pellets were placed into screw openings to prevent acrylic material from entering. The duplicate denture was removed and the excess occlusal material adjusted together with relief of the underside to accommodate impression material. 3M ESPE Express Light body (Vinyl Polysiloxane ) was used under lower denture and on the occlusal surface of

denture. The lower duplicate denture screwed onto implants and patient closed in centric occlusion.<sup>6</sup> After the appropriate setting time (4 minutes) the fixture mount retention screws were removed, and the denture/tray with the fixture mounts was removed from the mouth. The impression with fixture mounts and attached implant analogs and impression with the upper duplicate were forwarded to the dental laboratory. This impression technique simultaneously captured the soft tissue, the implant three dimensional position, the vertical dimension of occlusion, the interocclusal bite registration, and the desired incisal edge position of the upper and lower teeth.

Zimmer locators (TLOC4/3) were placed on the A and E implants and torqued to 20 Nm.<sup>7</sup> Healing caps were placed on the B, C, and D implants. Locator caps were placed on the patient's old lower denture and the denture relined using a self cure chairside reline material (Henry Schein).<sup>8</sup> This would help with the retention of the old lower denture. The removal and seating of the dentures was demonstrated. The patient received written and verbal post operative instructions.

At a subsequent appointment the upper denture (teeth in wax) was tried in for proper phonetics, esthetics and occlusion. The lower frame was tried in with teeth positioned in wax for passive fit.

The permanent hybrid bridge and the new upper complete denture were fitted approximately 3 months post implant placement. Again verified passive fit of the appliance by testing each screw

independently. With passive fit and tissue adaptation as desired the prosthesis screws were torqued to 20 Ncm.<sup>9</sup> Screws for the prosthesis were covered with cotton pellets, and the access holes in the acrylic were sealed with light cured composite (3M flowable). The occlusion was accessed for a balanced occlusion and the patient was given postoperative care instructions.

### DISCUSSION:

The primary advantages of the maxillary denture was ease of construction, lower cost to patient, adequate retention, good esthetics, and simple restoration of vertical dimension. The primary disadvantages with this choice were plastic palate, flanges and being removable. The primary advantages of the mandibular hybrid prosthesis include rigid retention, improved proprioception compared to traditional dentures, ease of cleansability, good restoration of vertical dimension with good esthetics, diminished size of the prosthesis compared to a flanged complete denture, retrievability and repairability, and comparable wear resistance compared to the maxillary denture.<sup>10</sup> This prosthesis also maintains anterior bone by endosseal stimulus of the bone and decreases posterior bone loss associated with a tissue-born prosthesis.

The disadvantages associated with the hybrid prosthesis are increased cost to patient and surgical treatment.

The flapless surgical approach reduced the surgical trauma and in turn the healing time for the patient. The use of locator

abutments on the implants in the A and E positions helped the patient to use the old dentures fairly comfortably during fabrication of the new denture and hybrid bridge.

The techniques discussed is simple and accurate form of impression taking and

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**FIGURES:**



Figure 1 Pre-operative



Figure 2 Duplicate of old lower denture



Figure 3 Try in of duplicate denture



Figure 4 Duplicate denture with fixture mounts



Figure 5 Duplicate denture with impression record



Figure 6 Duplicate denture with bite registration



Figure 7 Healing caps and Locator Abutments



Figure 8 Final Prosthesis



Figure 10 New Upper and lower fitted



Figure 9 Lower Prosthesis fitted



Figure 11 Post operative Radiograph