

BEYOND RESTORATION

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# Defining Space for a CAD/CAM Structure

By Doug Benting (/spear-review/author/doug-benting/) on February 2, 2016 |  (/bookmarks/bookmark/363)

Fig. 1

Dental implant (<https://www.speareducation.com/spear-review/category/implants>) supported prostheses were traditionally designed for mal-adaptive denture patients with significant alveolar bone loss in the mandibular arch. Fixed hybrid (fixed-detachable) prostheses for the mandible were originally designed as a highwater prosthesis, many of which have been in service for several decades. Modifications in the initial design include extended contours and removable prostheses to facilitate hygiene and provide options for supporting the structure of the lower third of the face whether for the maxilla or mandible.

## CAD/CAM and Dentistry

Live Chat

The application of the technology involved in Computer Aided Design and Computer Aided Manufacture, commonly referred to as CAD/CAM, to dentistry has improved predictability of the definitive supporting structures relative to the traditional casting techniques that were used for many decades. CAD/CAM

structures for full arch prostheses make use of a computer generated “hologram” to identify tooth position and the contours of the prosthesis to limit the vertical height and horizontal width components of either a connecting bar for an overdenture or the support structure for a fixed hybrid prosthesis. A vacuum formed thermoplastic record base provides the opportunity to make use of known reference points of the denture with the goal of providing meaningful information for the construction of a dental implant connecting structure whether for a removable prosthesis or a fixed hybrid/fixed detachable prosthesis. The *Ministar S* (Great Lakes Orthodontics, Tonawanda, NY) has the ability to apply positive pressure onto the complete denture while simultaneously creating a vacuum beneath the working model to optimize the adaptability of the thermoplastic material. (Figure 1)



Fig. 2

An interim prosthesis made as a trial prosthesis to “test” the overall restorative plan can provide useful information in planning the definitive restoration. Certainly, incisal edge position, midline position, occlusal plane come to mind based on facially determined reference points. (Figure 2) The palatal contours of the definitive prosthesis are another area of importance for our edentulous patients, particularly with a dental implant supported maxillary prosthesis. One technique to transfer the information gained from the interim prosthesis to assist in the process of CAD/CAM bar construction is described below:

1. Make an impression for a master working model. (Figure 3) This likely involves connecting the implant impression posts with a low shrinking resin and making the impression with an open tray technique.

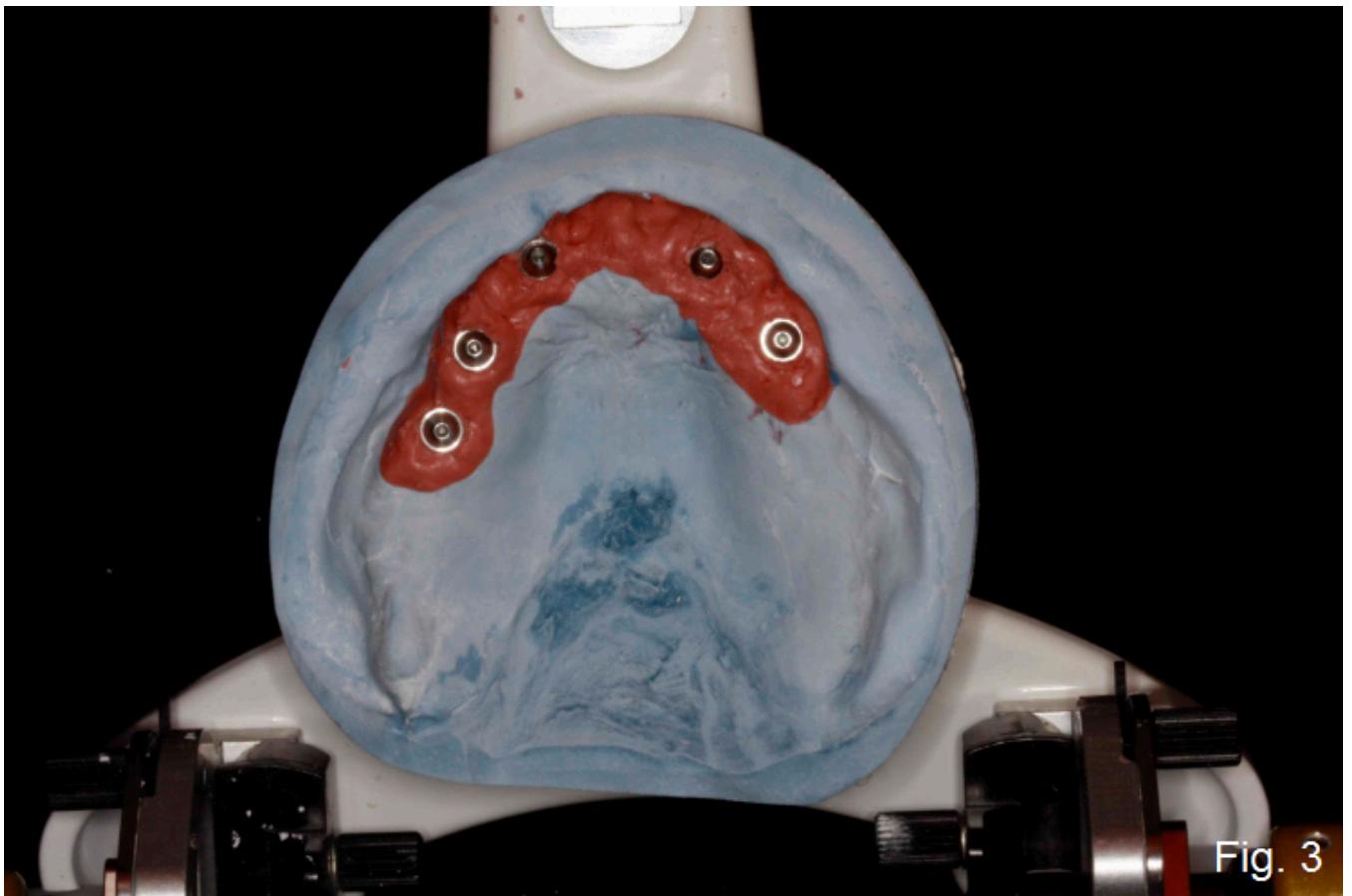


Fig. 3

2. Make an inter-occlusal record with the interim prosthesis in place and use that prosthesis to help mount the working model on the articulator relative to the opposing arch.
3. Make an impression of the interim prosthesis and create the full arch tooth form using bis-acrylic or acrylic.
4. Position cast within the vacuum-forming machine using lead pellets to expose the area of the master cast used to construct the denture base. (Figure 2)
5. Heat the 1.5 mm thick copyplast material (Great Lakes Orthodontics, Tonawanda, NY), apply air pressure with vacuum and allow time to cool. Trim the Copyplast to create a record base and replace on the master cast. (Figure 4)



Fig. 4

6. Add "sticky-wax" to the record base then add pink wax to connect the record base to the full arch of teeth made from the interim prosthesis. (Figure 5)



Fig. 5

7. Complete denture tooth set-up contour wax by adding thickness to the border areas and to the denture base providing adequate tissue support. (Figures 6 and 7)



Fig. 6



Fig. 7

8. Complete denture trial appointment, evaluate as appropriate for denture tooth esthetics, tissue support, occlusal contacts and phonetics.
9. Send the master working model, the connected impression posts, the record base with verified tooth position to the laboratory to complete the CAD/CAM process. (Figure 8)

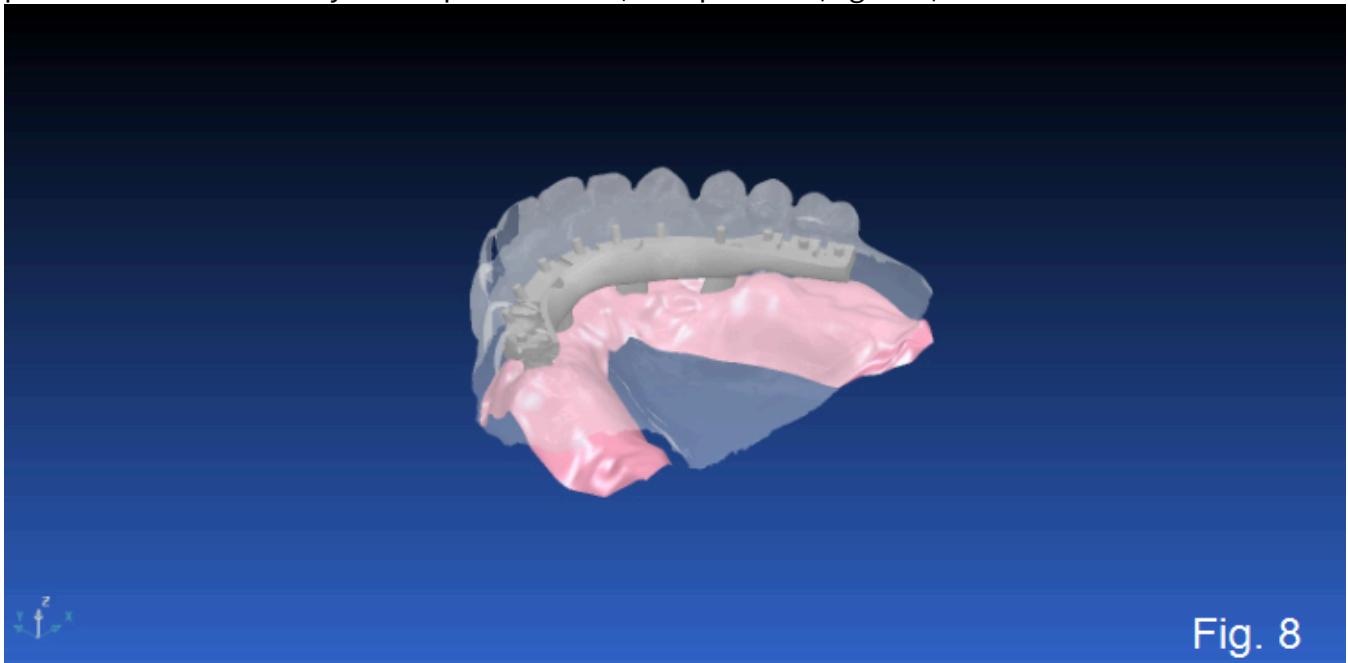


Fig. 8

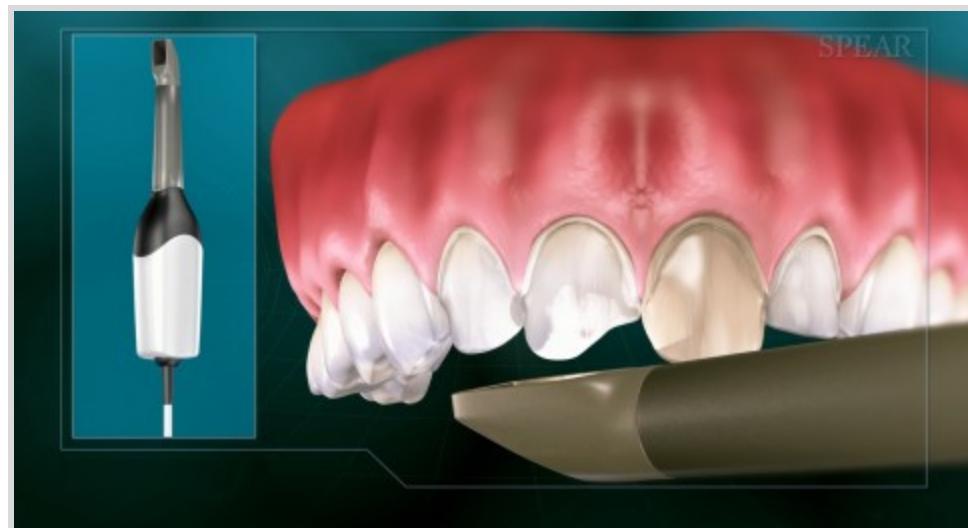
10. Proceed with trial of the dental implant supported connecting structure followed by trial evaluation of tooth position and insertion of the definitive prosthesis.

*(Click the link to read more articles by Dr. Doug Benting (<https://www.speareducation.com/spear-review/author/doug-benting/>).)*

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