

Quality of Life Regained: Utilizing An Implant Supported Bar Overdenture: A Case Report

Ronald Klausz, RDT

As dental implants are gaining in popularity as a viable addition to removable dentures, more and more dentists are recommending them as a treatment option to their patients. The aging population of “baby boomers” is seeking options that will meet function as well as aesthetics. They are insisting on medical therapies and treatments that will improve the quality of their lives.

When it comes to restoring the complete edentulous arch, the use of dental implants has dramatically added to the treatment choices

of today’s patients. No longer does a person have to accept the prospects of floating, loose den-

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tures that cause frustration and embarrassment. With dental implants, once again function

can be regained. Mandibular overdentures anchored on two anterior implants provide significantly greater satisfaction, quality of life and better mastication than do conventional dentures in edentulous patients.^{1,2} A panel of experts from McGill University recently recommended that mandibular overdentures become the standard of care for edentulism.³

The bar over denture has become a standard treatment option when it comes to the restoring of



FIGURE 1—Straight hader bar design.



FIGURE 2—Combination hader bar with locator design.



FIGURE 3—Primary bar with locator design.



FIGURES 4 & 5—Six locator abutments placed with a horseshoe shaped final prosthesis that allows flexing and causes micro movement leading to bone loss.



FIGURE 6—Bone loss as a direct result of non-splinting of implants in the maxilla with a horseshoe shaped denture.



FIGURE 7—Bone loss as a direct result of non-splinting of implants in the maxilla with a horseshoe shaped denture.

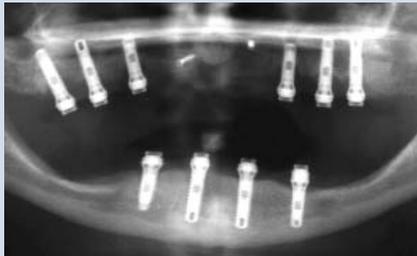


FIGURE 8—Panograph taken 2 years post surgical placement — note bone loss around maxillary implants.



FIGURE 9—Implants with healing caps.



FIGURE 10—Implants with healing caps.



FIGURES 11 & 12—Implants with closed tray impression copings.



FIGURES 13 & 14—Implants with abutments of varying collar heights.



FIGURE 15—Implant Positioning Records made on master casts.

edentulous arches. Depending on your treatment objectives and outcomes, there are many different types of bar designs that can be utilized to retain a denture. Bar designs range from simple

header bars with gold or nylon clips for dentures which will be tissue supported, all the way to primary structures with attachments for dentures which are implant supported (Figs. 1, 2, &

3). The design chosen will depend on many factors including the number of implants that are placed, their location in the arch, as well as the amount of intra arch space that exists.



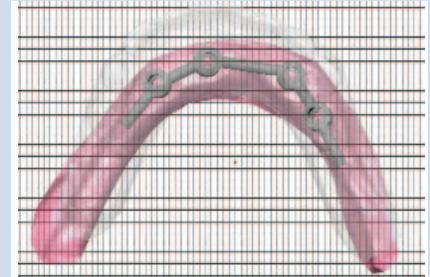
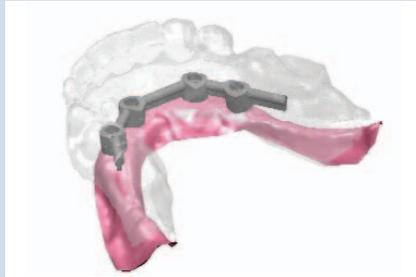
FIGURE 16—Implant Positioning Records made on master casts.



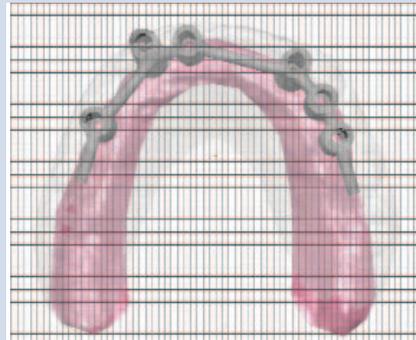
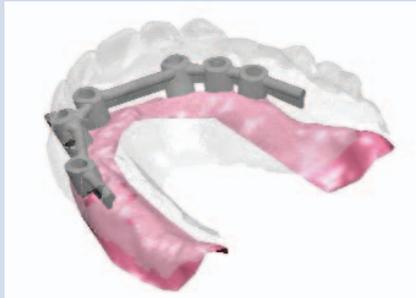
FIGURES 17 & 18—Implant Positioning Records seated intra-orally to verify fit.



FIGURE 19—Denture tooth set-up on screw retained bases at try-in.



FIGURES 20 & 21—Digital design of mandibular bar.



FIGURES 22 & 23—Digital design of maxillary bar.

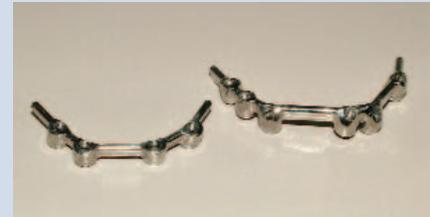


FIGURE 24—Milled bars ready for try-in.

Anecdotal observations from dentists I have consulted with suggest that implants placed in the maxilla should not be left free standing to retain dentures, without cross arch stabilization. By placing attachments, such as Locator Abutments (Fig. 4) or Ball Abutments into dentures without the cross arch stability of a full palate or distal palatal strap, bone loss can occur.⁴ This bone loss is not immediate, but will occur over time (Figs. 6-8). Bone loss around implant fixtures, in these situations, can be attributed to micro movement caused by the flexing of a horse-shoe shaped denture (Fig. 5).⁵

With poorer bone quality in the maxilla, it is advisable to splint these implants together when trying to minimize or remove palatal coverage in the final prosthesis. In the mandible, with its denser bone, the implants can be left as individuals and not splinted.⁶

In this clinical case, a standardized protocol for bar overdenture fabrication was followed.⁷ Four implants were placed strategically in the mandible and six implants were placed in the maxilla (Figs. 9 & 10). Closed Tray Impression Copings were screwed to the implants and fixture level

impressions were taken of both arches (Figs. 11 & 12), from which two soft tissue models were poured.

All the implants were placed subgingivally, thus allowing for the option of placing more implants in the future and fabricating fixed restorations. However, with the bar overdenture, this posed a concern for bar seating as well as the maintenance of hygiene. Ideally, when the treatment plan calls for bar overdentures, it is advisable to have the implant heads placed at or slightly above the gum line. As a result, abutments with varying



FIGURE 25—Milled bars at intra-oral try-in.



FIGURE 26—Internal view of mandibular denture with nylon clips and cast mesh.



FIGURE 27—Internal view of maxillary denture with nylon clips and cast palate.



FIGURE 28—Aesthetics and function restored.

rate positioning of the implants.

After the bite registration was done and the IPR confirmed the accuracy of the master models, the models were mounted and the denture teeth were set up on the same screw retained record bases. Once the ideal tooth position was established for aesthetics, function, and phonetics, and verified intra-orally at the try-in stage (Fig. 19), the bar fabrication was started.

Utilizing today's advanced CAD/CAM technologies, Biomet 3I's CAM StructSURE Precision Milled Hader Bars were fabricated. Milled from a solid block of titanium alloy, these restorations are lightweight and provide a passive fit without the potential weakness associated with cutting and soldering.

collar heights were placed on the implants to bring the height of the implant/bar margins to the gingival crest (Figs. 13 & 14).

Bite blocks were fabricated, using two temporary cylinders luted to the base plate. By utilizing the temporary cylinders, the record base could be fastened to a few of the implants to give stability and ensured a more accurate bite registration was achieved.

To ensure the master model was accurate and to ensure the bar to be fabricated had a passive fit, an Implant Positioning Record (IPR) was made. Non-engaging temporary cylinders were placed onto each implant on the master model. They were weaved together with dental floss and finally covered over with pattern resin (a quick setting, low expansion acrylic) (Figs. 15 & 16). This index was

taken to the mouth and placed onto the implants to ensure a passive fit (Figs. 17 & 18). If the index rocked or did not seat fully, it needed to be sectioned

Once the fit of the bar was confirmed on the implants intra-orally, the case was sent back to the lab for final processing

and luted together on the implants in the mouth. In the lab, a new set of fixture replicas (analogues) were secured to the temporary cylinders and a base was poured. Using this new model we ensured that the bar fitted passively as it represents an accu-

After a detailed scanning of the master cast and overdenture tooth set-up, a proposed design was prepared for assessment (Figs. 20-23). Consideration was given to the amount of space between the bars and soft tissue of the ridge, that adequate space was allotted for the female attachments inside the confines of the denture, as well as many other details that can affect the final outcome of the case.⁸ Once approved, the milling of the bar was completed and the finished, polished bars were verified for accuracy of the fit and of the design prior to sending the bars to the dentist's office for try-in (Fig. 24).

Once the fit of the bar was confirmed on the implants intra-orally, the case was sent back to the lab for final processing (Fig. 25). A cast partial frame was fabricated in a horseshoe shape for the maxillary arch. The casting allowed for less

palatal coverage as well as less weight and bulk while still maintaining strength. A cast mesh frame was made to reinforce and strengthen the mandibular denture. The acrylic was processed attaching the female, nylon clips in their correct place (Figs. 26 & 27).

The final case was inserted with the placement of the bars and the insertion of the overdentures (Fig. 28). A great result was achieved leaving the patient with stable, aesthetic, functioning dentures.

Today's patients take excellent aesthetics, form and function for granted, even for implant-based restorations. With today's advances in materials and technology a greater quality of life can be provided to the totally edentulous patient.

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Ron Klausz, R.D.T. is owner of Klausz Dental Laboratories, located in Toronto, Ontario. He has written numerous articles on restorative and implant dentistry and has lectured in both Canada and the United States. He keeps with the family traditions of producing advanced, high quality restorations and appliances while developing unique client and patient care services. He has modernized a company, whose focus is still based on fulfilling client needs. "Working harder and smarter for your practice!" is their credo.

Oral Health welcomes this original article.

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