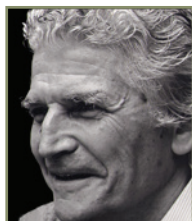


# Simultaneous implant reconstruction of the maxilla and mandible

By Dr Prashant Patel, Gusseppe Zuppari and Oliver Tilch



**A** 67-year-old female patient was referred to our practice complaining of her dislike for her, as she coined, “bucky beaver” teeth (Figure 1). She’d been wearing a partial denture since her 20’s and now her entire dentition was failing. Her preference was to eliminate the removable prosthesis.

A full clinical evaluation was completed (Figure 2) which revealed myriad concerns including an irregular incisal plane and disrupted smile line; class II skeletal pattern and class II dental malocclusion with increased overjet; generalized periodontitis; increased tooth mobility; and heavily restored teeth.

A cone beam CT scan indicated good bone volume in both arches, however, that could support the placement of multiple implants. After discussion of all the treatment options, it was agreed to use immediately placed fixtures but a delayed loading protocol.

This would allow for correct tooth positioning over multiple try-ins if necessary.

Under general anaesthetic, all teeth were removed and Six Nobel Speedy implants were placed in each arch (Figure 3).

## Provisional phase

For this patient, the definitive restoration will be Zirconia supported ceramic in the upper arch and titanium supported acrylic in the lower arch. Because the incidence of ceramic chipping on

implant-supported bridges is high, especially with Zirconia, the design of the framework is crucial. This provisional phase ensures minimization of unsupported ceramics. Correct dimensions of the framework can be ensured and particularly in the maxilla, phonetics and aesthetics can be trialled over a 3-6 month period. The tissue fitting surface can be shaped and modified to ensure cleansibility.

The teeth are carefully set on wax rims attached to the implants with temporary cylinders using traditional prosthodontic principles - facial/dental midline alignment, incisal edge position, incisal and occlusal plane orientation, lip support and tooth display. Using verti-centric principles the centric relation is recorded at the correct vertical dimension of occlusion with the anterior teeth in light contact (Figures 4 and 5).

The provisional bridges are then completed in the laboratory using cold cure, wire reinforcement and temporary titanium cylinders (Figure 6). Careful attention is paid to the soft tissue contouring to provide ideal gingival display and ease of cleaning. There are no flanges and only ovate pontic connection to the tissue. Space is left interproximally for the placement of Piksters and Waterpiks. Every attempt is made to make this as close to the final restoration contours as possible - this will act as the template for the final bridge framework design (Figure 7).

During this 3-6 month period, the bridge can be modified for aesthetics, tissue contours, occlusion and cleansibility.



Figure 1. A 67-year-old female patient with failing dentition.



Figure 2. Problems included irregular incisal plane and disrupted smile line; class II skeletal pattern and class II dental malocclusion with increased overjet; generalized periodontitis; increased tooth mobility; and heavily restored teeth.



Figure 3. Under general anaesthetic, all remaining teeth were extracted and Six Nobel Speedy implants were placed in each arch.



Figures 4 (left) and 5. During the provisional phase, the teeth are carefully set on wax rims attached to the implants with temporary cylinders. Using verti-centric principles the centric relation is recorded at the correct vertical dimension of occlusion with the anterior teeth in light contact.

### Definitive restoration

The provisional bridges are worn for six months. During this period, aesthetic alterations can be made and cleansibility assessed. New master impressions are then taken and the provisional bridges used to articulate the casts (Figure 8). Silicon keys are used to record the tooth position of the provisional bridge pre-

cisely on the new master casts, allowing in the maxilla, a cut back of 1.2mm for layering of ceramic. The upper framework is milled in zirconia (Figure 8).

For the lower framework, the acrylic teeth are supported by metal, but allowing adequate thickness of acrylic for colour and strength. This framework will be milled in titanium (Figure 9).

The frameworks for both bridges are then scanned one-to-one using our in-house NobelProcera Scanner. All the planning has been done by careful replication of the provisionals so there are no surprises. Using this approach allows for careful control of shape, midlines, shade, gingival margin position and cleansibility (Figures 10 and 11).



Figure 6. The provisional bridges are completed in the laboratory using cold cure, wire reinforcement and temporary titanium cylinders.



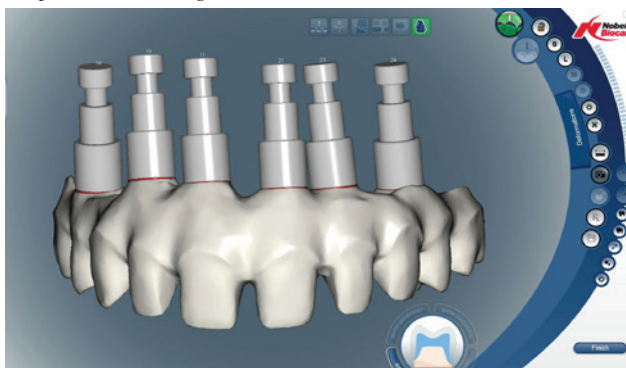
Figure 7. Every attempt is made to make the provisional as close to the final restoration contours as possible.



Figure 8. After wearing the provisional bridges for 6 months, the provisional bridges are used to articulate the casts.



Figure 9. The upper framework will be milled in zirconia whilst the lower will be milled in titanium.



Figures 10 and 11. Using the NobelProcera CAD/CAM software, shape, midlines, shade, gingival margin position and cleansibility are carefully managed.



Figure 12. NobelProcera scanner.

The frameworks are checked for passive fit. The silicone keys are then used to relocate the acrylic lower teeth, ensuring adequate spacing for the acrylic (Figure 13). This allows for completion of the upper ceramic work against the correct lower tooth position. In this case the upper bridge is 10 units to minimise the cantilever to one tooth only (Figure 14).

The lower is then processed (Figures 15 and 16). The gingival colour is matched easily with the Anaxdent Gum Kit (Figure 21). The positioning of the lower implants allows restoration of 12 teeth without cantilevers (Figure 22).



Figure 13. Lower framework milled in titanium.



Figure 14. Upper framework milled in zirconia.



Figures 15 and 16. Processing the lower framework. The gingival colour is matched easily with the Anaxdent Gum Kit.



Figures 17 and 18. Layering the upper with Creation ZI.



Figure 19. Bridge ready for try-in



Figure 20. Bridge after glaze.



Figure 21. Anaxdent Gum Kit.

Interdental cleaning is facilitated by careful soft tissue contouring and placing access points next to fixtures (Figure 23). Tooth size and position as well as gingival height and soft tissue contour have been replicated and controlled throughout. The definitive restoration is shown in colour and the provisional bridges in black and white (Figure 24). The patient has little to adapt to with the new bridges. Excellent soft tissue health is maintained (Figure 25) and the patient's smile tells the story (Figure 26).



Figure 22. The positioning of the lower implants allows restoration of 12 teeth without cantilevers.



Figure 23. Interdental cleaning is facilitated by careful soft tissue contouring and placing access points next to fixtures.



Figure 24. The definitive restoration is shown in colour and the provisional bridges in black and white.



Figure 25. Definitive restoration in situ showing that excellent soft tissue health has been maintained.



Figure 26. The patient's smile tells the story!

### About the authors

*Prashant Patel is a specialist prosthodontist in private practice at Sydney Dental Specialists in Bondi Junction. He graduated from the University of Otago in 1993 and completed his masters program at the University of Queensland in 2001. He is a member of the Royal Australasian College of Dental Surgeons; the International College of Prosthodontists; the Australian Society of Prosthodontists; the Australian Osseointegration Society; and the Academy of Australian Prosthodontists. His particular interests are in finding pragmatic solutions to complex dental problems, guided implant surgery and restoration longevity. Prashant is very experienced in the use of the latest 3D implant placement software and has lectured extensively on its clinical applications.*

*Giuseppe Zuppari is a Master Dental Technician at Oral Design Naples. In 1969 he met the legendary Dr. P.K. Thomas and started to attend his training courses. In 1971 he became the founding Director of G. Zuppari Dental Laboratory in Naples which became the first Oral Design Centre in Italy and worldwide. Giuseppe's professional approach and focussed passion of aesthetic evolution and the most advanced development of techniques and materials available have led him to share his passion and knowledge of aesthetic excellence. He lectures not only nationally in Italy, but internationally at many prominent conferences. He is author of several publications and co-author of "The State Of The Art In Ceramics" (MEA S.r.l. Publishing) and "Progress in Dentistry".*

*Oliver Tilch (MDT) from Germany is a ceramist based at Sydney Dental Studio in Bondi Junction. He trained at one of the Germany's leading dental schools, the Trade Academy Freiburg. In 2009, he proudly participated in the prestigious world renowned KK Award in Germany and his Masters' portfolio was published in 4 parts in the scientific journal "Quintessenz" in 2009 and 2010. He is an expert in All-on-4 protocols, bar design for implant bridges, CEREC, CAD/CAM and implant abutment design. He is motivated to consistently improve production to achieve the best possible outcome for customers and patients as well as to ensure smooth business operations.*