One of the main challenges facing implantologists is lack of bone volume. This is often worse in the posterior maxilla where the pneumatization of the sinuses can often contribute to reduced bone height available for implant placement, as well as bone atrophy. Despite advancements in surgical techniques and the use of bone grafting there are still limitations to what can be achieved with implant supported fixed prosthetics in patients with advanced atrophy of the maxilla. Several studies have looked at the use of zygomatic implants to overcome these problems. Zygomatic implants are self-tapping screws in c.p. titanium with a TiUnite surface. They are available in eight different lengths and present a unique 45 degree angulated head to compensate for the angulation between the zygoma and the maxilla.

As the All-on-4 concept from Nobel Biocare offers immediate load and function, these implants have become an important addition to our armamentarium in restoring the more complex cases, without the need to delay loading and so subject our patients to a temporary removable prosthesis.

CASE STUDY
A very pleasant 57-year-old lady was referred to us by her dental practitioner. She had worn a full denture in the upper arch for eight years and was increasingly dissatisfied with the fit of...
the teeth and also the limitations this placed on her life. Medically she was fit and well and took no medications.

Clinical examination revealed an intact lower dentition, which was under ongoing treatment by her practitioner for periodontal disease and an edentulous maxilla (Figures 1 and 2). The treatment options available were:

1. Provision of a new full denture.
2. Extensive bone grafting, implant placement and restoration with either fixed or removable prosthesis.
3. Immediate fixed prosthesis following the All-on-4 protocol.

**TREATMENT PROCEDURE**

The patient immediately discounted a replacement denture as she wanted a fixed option. She had discussed and discounted extensive bone grafting with her dental practitioner. She was assessed for the All-on-4 procedure but her orthopantogram (Figure 3) showed severe bone resorption in the posterior maxillary regions, which prevented treatment under the standard All-on-4 protocol. The provision of Zygomatic implants was discussed with the patient who decided this was the option she preferred. As a Same Day Smiles referral centre we are one of the few sites in the UK able to offer this treatment.

Following a CT scan the surgery was planned using the NobelGuide software (see Figure 4). Preoperative records (impressions, facebow record, bite registration and clinical photographs) were taken for our Same Day Smiles technician to construct a prototype acrylic bridge. Following acceptance of a detailed written treatment plan and pre and post surgical instructions the patient attended for surgery under IV sedation and local anaesthesia.

The provisional bridge was first tried as a conventional denture to check for a satisfactory occlusion and to verify and record incisal edge position and vertical dimension.

A crestal incision was made from the approximate position of the first molar to the same position on the contralateral side of the arch. A full thickness mucoperiosteal flap was raised both buccally and palatally to expose enough bone to allow correct positioning of implants and good visualisation whilst retaining attachment to ensure a good blood supply and assist healing.

The clear surgical guide was used not only to assist with implant position but also to ensure adequate room was created between hard tissue and tooth position to allow for prosthetic componentry. Where there was insufficient space bone reduction was indicated.

**IMPLANT PLACEMENT**

NobelActive implants were placed in the lateral incisor sites carefully following established drilling guidelines and referring to our surgical guide for ideal implant position. In this case the implants were placed at 70ncm. In the posterior region the soft tissue was reflected from the crest of the ridge up to the Zygomatic buttress, ensuring that the suborbital nerve was identified. A window was made by drilling between the zygoma and the sinus, this assisted with orientation of the Zygoma implants and allowed reflection of...
Schneider’s membrane. The drill protocol was followed carefully and the correct length of implant was selected following measurement with a depth gauge. The correct length of implant was selected and placed at 45nm.

Following placement of the four implants, multi-unit abutments were selected and attached to the implant heads. The correct angulation was established by referring to the clear surgical guide ensuring the posterior screw access was through the occlusal surface of the premolar/molar teeth and the anterior access was just palatal to the incisor teeth.

IMPRESSIONS
Impression copings were then attached to the multi-unit abutments and the surgical site was closed with simple vicryl 4.0 sutures. The impression copings were linked together with a rigid bite registration material and an impression was taken in a medium body silicone in a special tray. This was used by our technician to produce a master model on which he converted the denture into the provisional acrylic bridge. The master model was used, along with visual checks in the mouth to produce two holes in the denture which corresponded with the anterior implant positions. Temporary copings were attached to the anterior multi-unit abutments and cold-cure acrylic was injected into the space created by the technician to pick up the correct position of the denture. It was important to position the denture in the correct occlusal position and at the correct vertical dimension referring to the earlier measurements we recorded.

Our Same Day Smiles technician then converted the denture into a prototype acrylic bridge. During this time we placed healing abutments over the multi-unit abutments and the patient was allowed to relax and offered refreshments.

Following conversion and processing the bridge was tried in place and the occlusion carefully checked, ensuring even contacts on the left and right and no contact posterior to the posterior screw access to reduce the risk of acrylic fracture. The patient was given detailed post-operative instructions and reviewed after a week.

END RESULT
Six months later the provisional bridge was replaced with a permanent acrylic bridge wrapped around a titanium NobelProcera implant bridge. If the patient is happy with the design of the prototype bridge this can be mirrored in the final prosthesis, as was the case here.

The final words are best left to the patient, after all, they are the reason we do what we do:

‘Having been a top denture wearer for several years, I had a large amount of bone loss and didn’t think that implants would be suitable for me. However, thanks to Alex and his team at Penistone Dental Practice I now have a full dental bridge attached to zygomatic implants and my whole life has changed. I now have my old smile back, have teeth that look natural and function perfectly and I am no longer afraid to bite into hard foods. At last I am free of fixing/re-fixing my denture with messy dental glues and feel and look (so I am told), 10 years younger. I would recommend this procedure to all.’

Lesley Clarke

REFERENCES


For a list of references or to ask a question/comment on this article, email PPD@fmc.co.uk