Implant treatment in the aesthetic zone

Dr. Jan Spieckermann, Ulf Neveling

Introduction:
A female patient, aged 41, was referred to our clinic after traumatic loss of her central incisors. Unfortunately when teeth are removed the bone and soft tissue complex that supported the teeth tends to atrophy away quite quickly. Even if enough bone volume remains to support implants, aesthetically and functionally the results can be unsatisfactory. In this case the patient lost her maxillary incisors many years ago and she was forced to wear a removable partial denture restoration. This was relatively bulky and unsatisfactory. In addition a tomography developed in the regions covered by the restoration. She was requesting an implant supported restoration.

On initial examination it was obvious that the maxillary alveolus in the region was considerably diminished and in its present form would not be able to accommodate implants properly. So the region needed to be augmented to regenerate a ridge which would be suitable in the amount of bone and soft tissue as well. There are many options available to reach this goal. Traditionally these may include ridge splitting and expansion, bone block therapy or large scale particulate augmentation by one means or another. Some of these procedures are quite invasive, require harvesting bone from a second site and a careful management plus patients compliance in the healing process. Due to severe alveolar bone loss in the defects site, allogenic bone blocks seem to be the best option to fill the defect in the maxillary anterior region in this case.

We decided to take a modern way of reconstruction. The region was mapped via CT-scan. To create the right amount of grafting, virtual implant planning is used to have a classical backward planning. Implants are placed in the perfect position for the final bridge by importing an optical scan of the waxup into the DIOCOM-data of the compromised site. “Virtual” bone blocks are designed surrounding those implants and were milled from donated human head of femur bone using Botiss® Bone-Builder technology. These blocks offer a nearly perfect fit and allow a relatively simple surgical procedure within a short time.

To keep the once planned position of the implants, a 3D-printed surgical guide is used during the final implant placement to reduce the time of surgery in this step, too.

Treatment Performed:
Therapy was performed in several stages.

Stage 1.
The patient was referred with an “flipper” as a replacement for her maxillary incisors. A cone beam tomography was necessary to evaluate the maxillary defect.

Stage 2.
Patient customized allogenic bone blocks were grafted to the anterior maxilla for horizontal ridge augmentation.

Stage 3.
Six months after bone grafting, removal of bone fixation screws and guided placement of two implant in the lateral incisor region.

Stage 4.
Six months after implant placement, a second stage exposure and augmentation procedure and placement of two gingivomers.

Stage 5.
Two weeks later, customized provisional abutments (Zirconia) were inserted and a provisional bridge was placed.

Stage 6.
One month later, final Zirconia abutments with a custom were inserted and a final bridge of Ceramic layer to Zirconia was placed.

Discussion:
Missing maxillary incisor sites often show horizontal and vertical atrophy, with inadequate conditions for implant placement. Therefore bone and soft tissue grafting is often necessary to develop the optimal site for the implant. To select the appropriate surgical procedure of reconstruction, a wax-up or even a provisional prosthesis can be helpful to assess the amount of bone and soft tissue deficiency. In this case patient customized allogenic bone blocks were used for two-stage alveolar ridge augmentation. Based on CT/CTBCT scans, the bone blocks were virtually designed and in second stage milled from processed cancellous bone blocks originating from living human donors. Implants were placed six months after bone grafting surgery using a SMOP surgical guide, based on the initial augmentation planning in order to achieve correct three dimensional implant positioning.

Conclusion:
A surgical plan based on the prosthodontic design and desires of the patient should be established after the evaluation of the existing hard and soft tissue. The planned implant procedure steps should be discussed with the patient regarding treatment time and treatment costs.

Dr. Jan Spieckermann
Clinik for oral surgery & implantology
Reichsstr. 34
D-09112 Chemnitz
Germany

Mail: info@dr-spieckermann.de
Web: www.dr-spieckermann.de

DR. JAN SPIECKERMANN
MARKS FUR ORALCHIRURGIE & IMPLANTOLOGIE