6TH INTERNATIONAL CAMLOG CONGRESS
JUNE 9–11, 2016
KRAKOW, POLAND

3D augmentation of the jaw with an individualized, CAD-CAM designed titanium mesh

K. Sagheb, E. Schiegnitz, M. Moergel, W. Wagner

MKG MUND KIEFER GESICHT CHIRURGIE

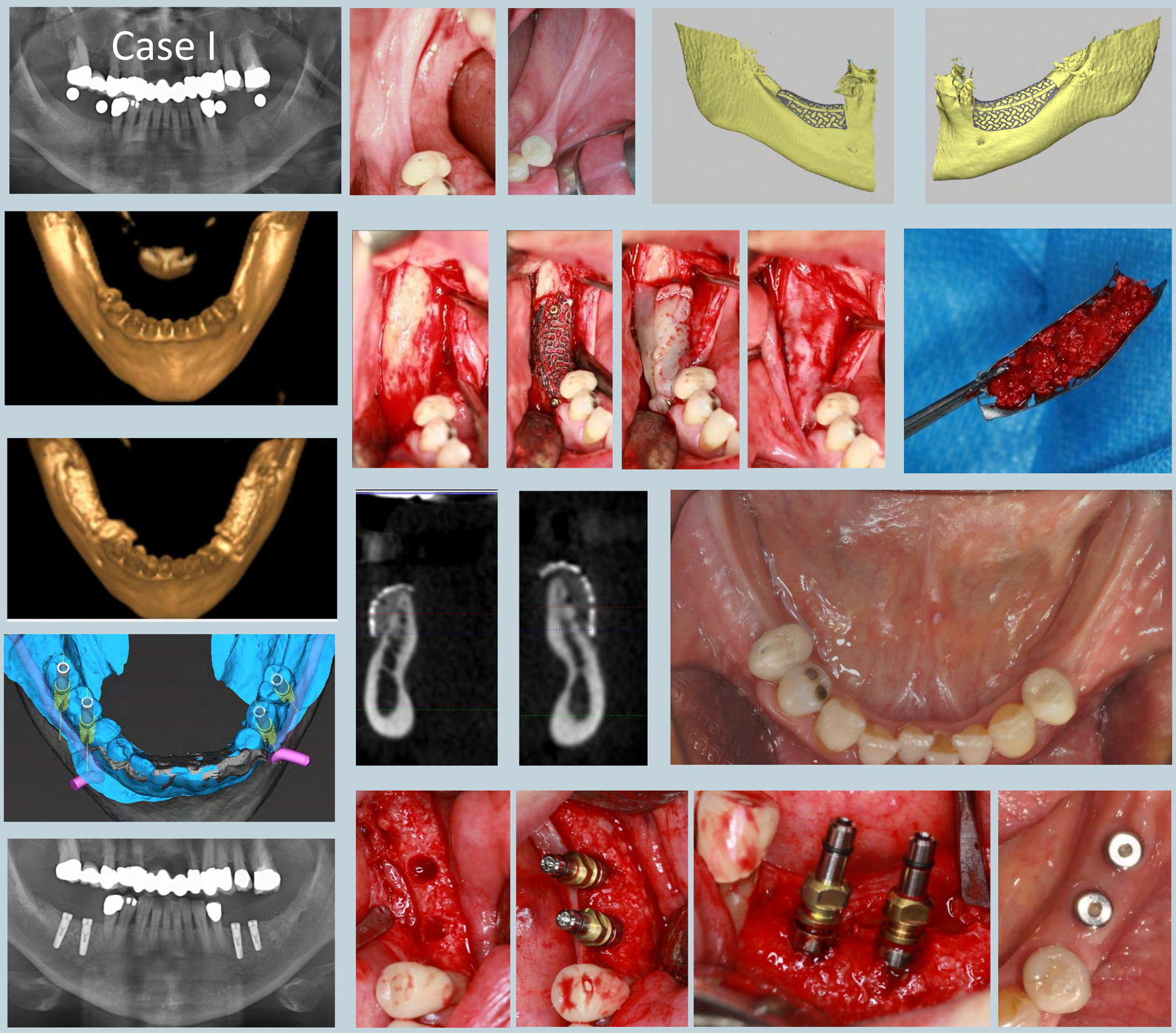
UNIVERSITÄTSmedizin. MAINZ

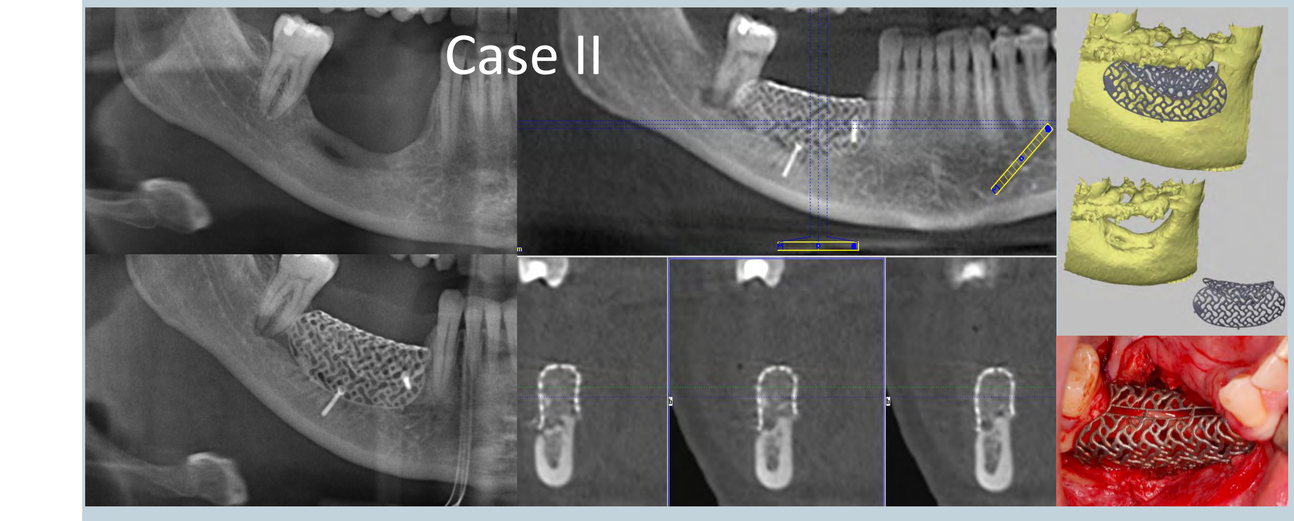
Klinik und Poliklinik für Mund-Kiefer- und Gesichtschirurgie
Plastische Operationen

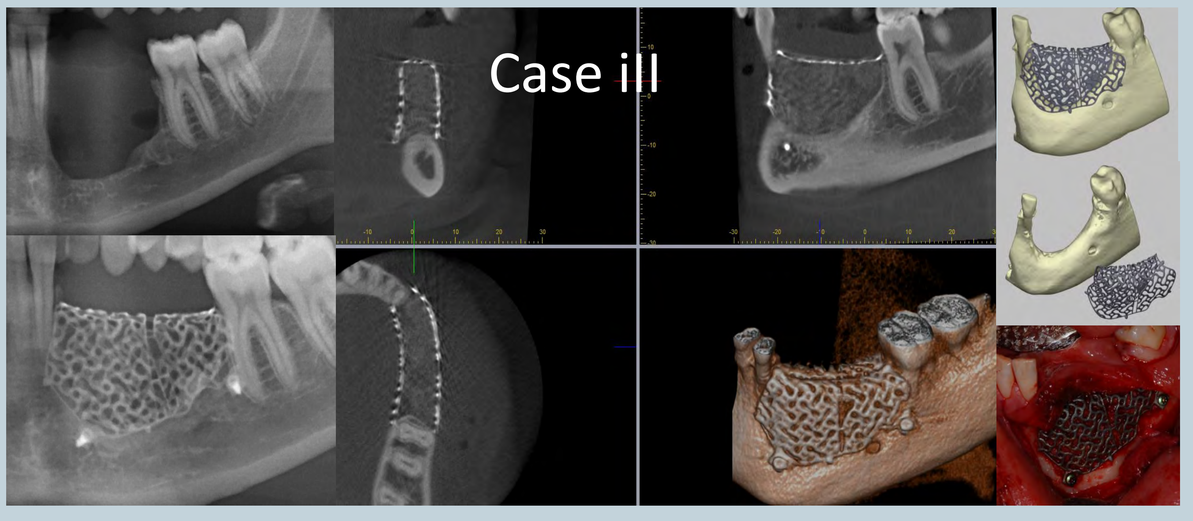
Objective: The augmentation of the jaw continues to be challenge especially when vertical ore combined defects have to be restored. The CAD-CAM technology provides the opportunity to improve old and established augmentation techniques such as the use of titanium mesh for onlay and guided bone regeneration techniques. ReOss© provides an individualized CAD-CAM-based titanium mesh based on the CT or DVT DICOM data of the patients.

Methods: In 19 Patients (22 different defect regions) this new augmentation technic were evaluated. DVT-based DICOM data of patients who needed a horizontal, vertical or combined augmentation were used to create an individualized titanium mesh. For the augmentation a mixture of autologous bone most harvested in the lower jaw and BioOss© pariticles (1:1) was used. All defects were covered with a BioGide© in combination with PRF membranes. All patients received antibiotic therapy for 5 days. Reentry with explantation of the titanium mesh and simultaneous implantation were performed after 6 months.

Results: A total of 19 patients (26% male, 74% female) with average age of 34y (min 18y, max. 60y) were augmented in 22 different regions. (14 in the lower jaw and 8 in the upper jaw). 41% of the cases had a horizontal defect, and the remaining cases had a vertical or combined defect. The augmentation was performed to replace 3 teeth (min 2, max 7) on average. In all cases the tailor-made titanium shell could easily be placed into the planned area of augmentation. 23% of cases presented an exposure of the titanium mesh during the healing period. Neither a total loss of the augmentation was observed nor did the exposure lead to a situation in which the planned implantation could no longer be carried out. All cases showed a sufficient augmentation volume that was congruent with the preoperative planned augmented volume.







Conclusions: Individualized ReOss© CAD-CAM titanium-mesh provides a sufficient technique for the augmentation of the jaws. The quick and easy application in the augmentation region is a great advantage even in complex defect geometry. But the soft tissue covering remains one of the most critical steps.

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