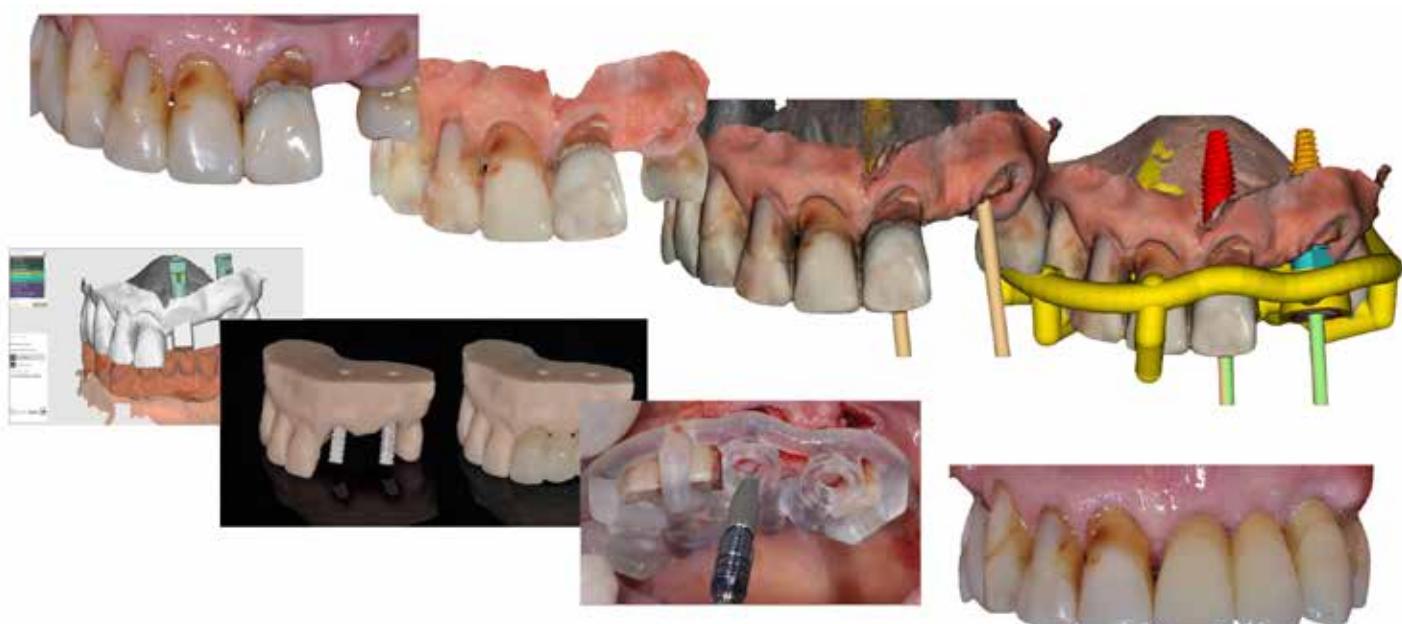


IMMEDIATE FULLY GUIDED IMPLANTATION AND PROVISIONAL RESTORATION WITH A PRE-FABRICATED TEMPORARY MAXILLARY ANTERIOR BRIDGE 21i X 23i

Awarded the Best Digital Implant Case at the 2018 Digital Dental Academy Awards



Dr. Beat R. Kurt

Specialist for Oral Surgery (SSO-Swiss Dental Association)
Oral Implantology (WBA)

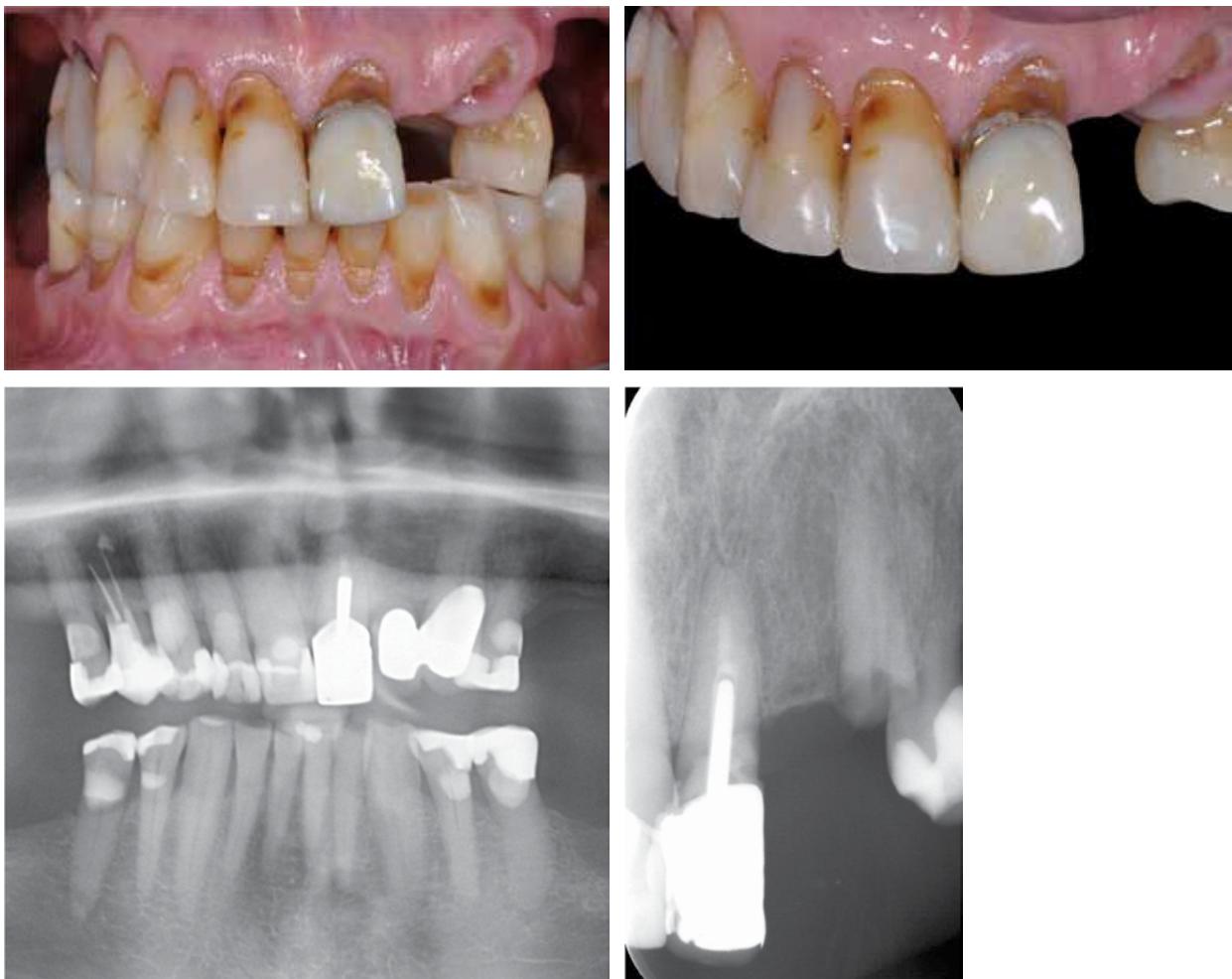
Dr. Beat R. Kurt received his Master's degree in dental medicine in 1990 from the University of Bern, and he completed his postgraduate education in oral surgery at the clinic of dentomaxillo surgery at Central Hospital of Lucerne. He currently specializes in implantology, guided implant surgery, soft tissue management and bone augmentation and is a referral for oral surgery, complex reconstructive dentistry and synoptic dentistry.

Dr. Kurt has been in private practice for 20 years in Lucerne, Switzerland, and has over 12 years of experience working with various guided surgery systems. He currently uses the Camlog and Straumann implant systems in his practice and has three years of experience in using a complete digital workflow.

ANAMNESIS AND CLINICAL SITUATION

A 77-year-old healthy male was referred to my practice for an implant rehabilitation of the maxillary left anterior region.

He was recently in an accident and fractured the two pillars of the existing bridge, 21x23. As a result, both teeth were not viable for fabrication of a new conventional bridge.



Initial situation showing fractured pillars 21 and 23

DIAGNOSTIC RECORDS AND PREWORK

After acquiring the initial photos and radiographs, a digital impression was captured using the CS 3600 intraoral scanner.



Digital impression capture with the CS 3600 intraoral scanner

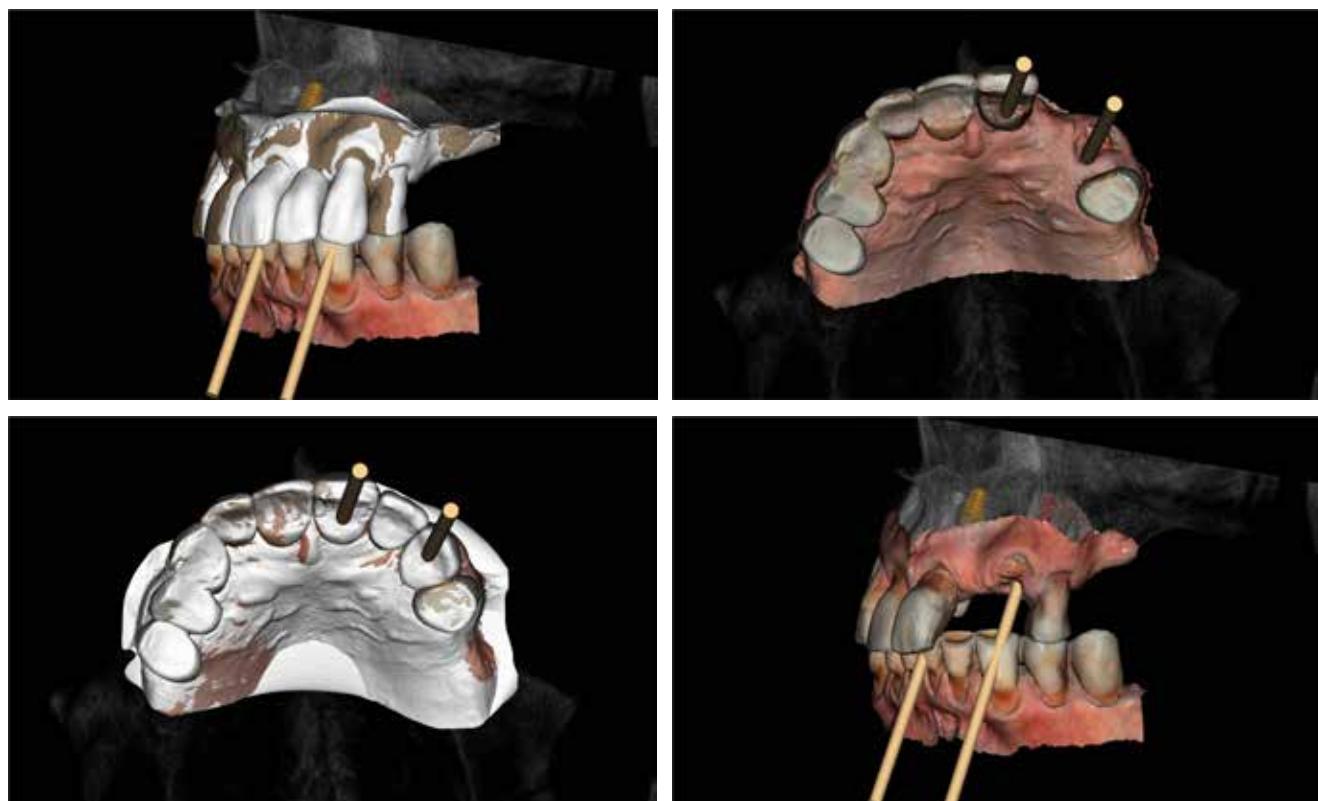


Reviewing the digital impression in CS MeshViewer software

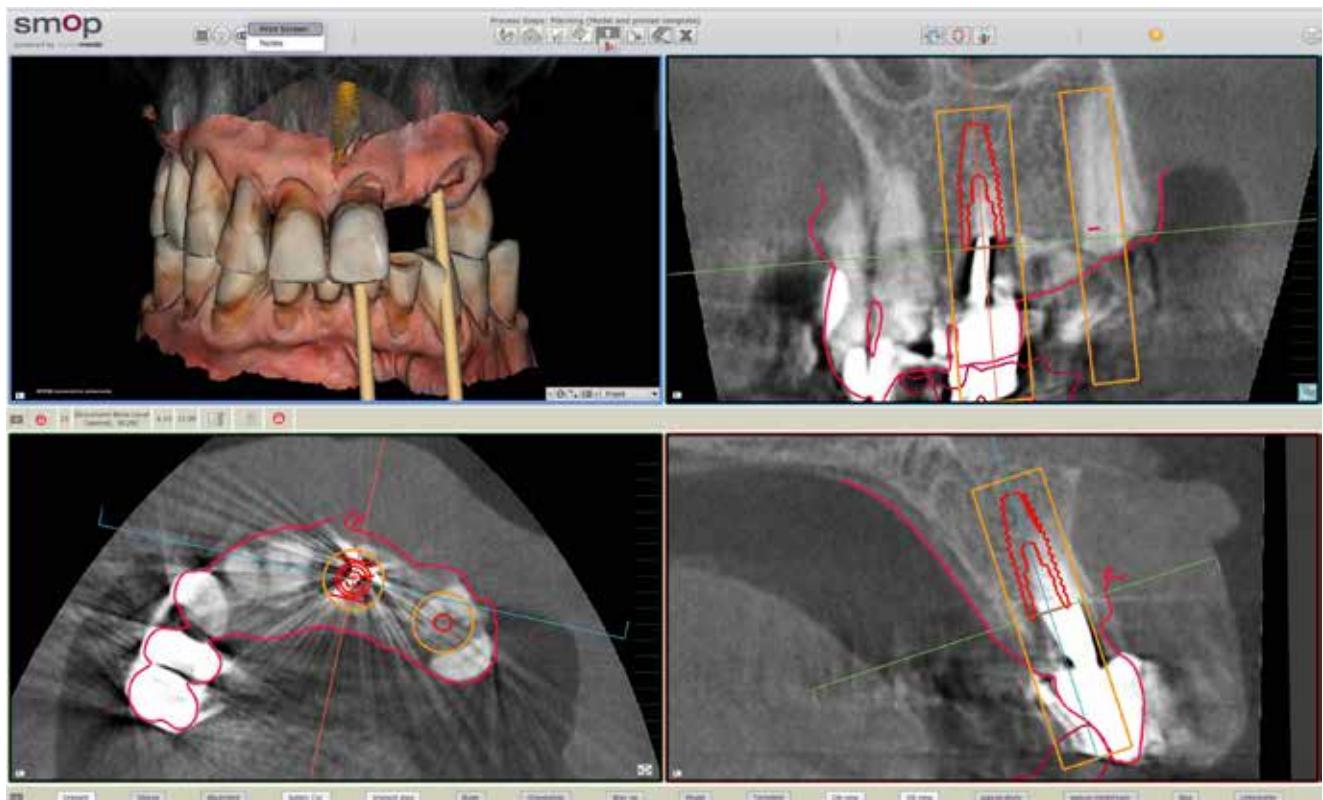
Additionally, a pre-operative CBCT scan was acquired.

The CBCT and digital impression files were sent to the dental lab technician for design. The technician imported the files into exocad software and designed a wax-up for the new implant bridge for teeth 21ix23i.

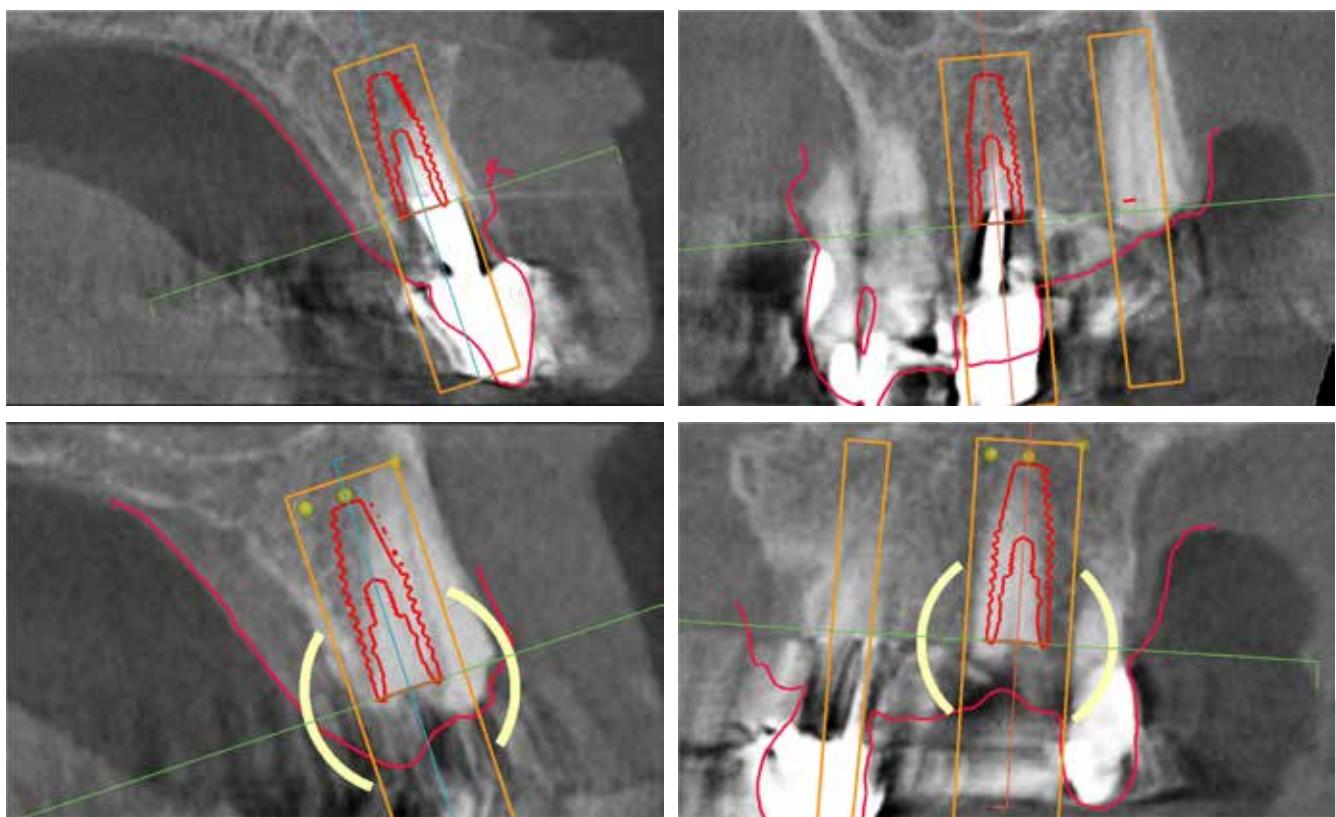
The DICOM data, a modified model where the fractured roots of 21 and 23 were virtually extracted in Meshmixer software, the opposing arch model and the new wax-up from the lab technician were then imported into the SMOP implant planning software from swissmeda.



Viewing the digital impression and wax-up in SMOP implant planning software



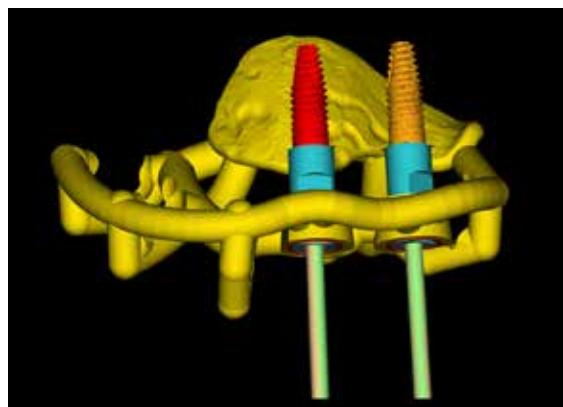
Initial implant placement in SMOP implant planning software with merged CBCT and digital impression datasets



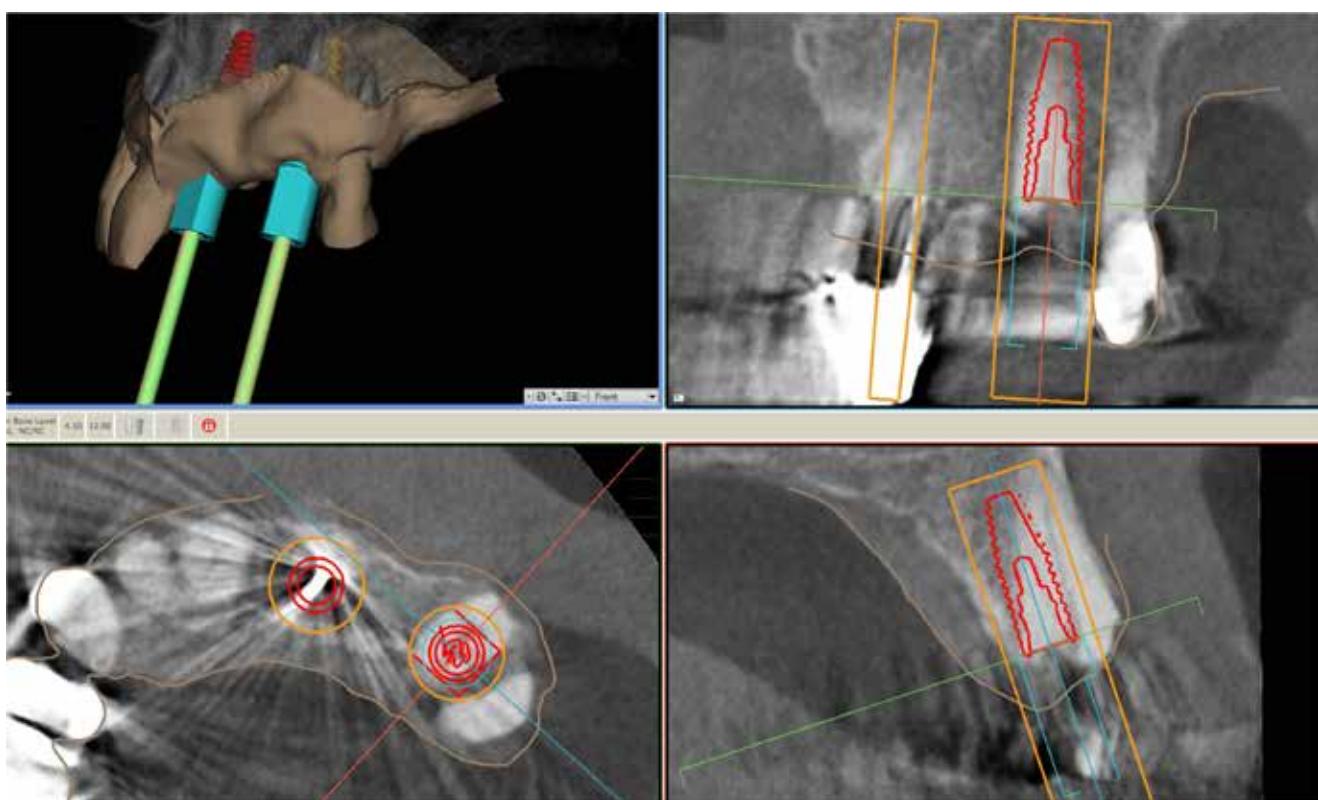
Simulated implant placement in SMOP implant planning software

Now the implants could be optimally planned to achieve the goal of immediate implantation and placement of a direct screw-retained bridge on teeth 21i x 23i.

Two Straumann BLT RC 4.1mm, 12mm implants were planned in regions 21 and 23.

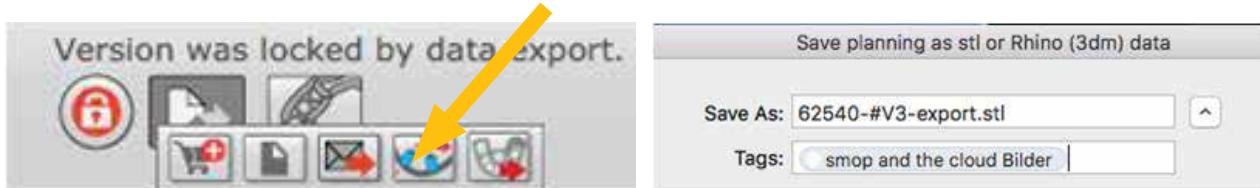


Virtual model of the surgical guide and implant placement

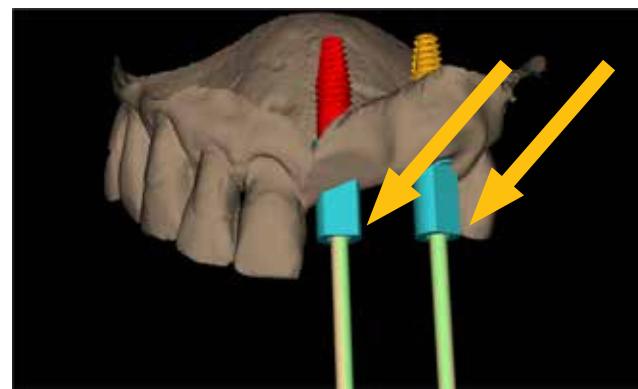
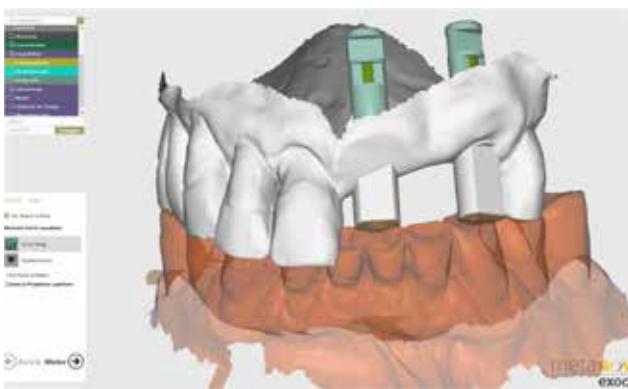


The position of the implant with the integrated virtual scan bodies

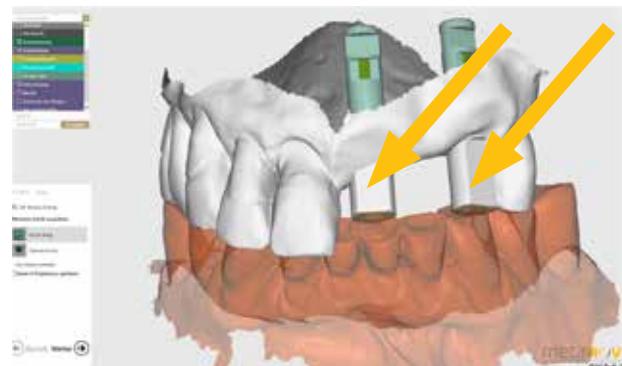
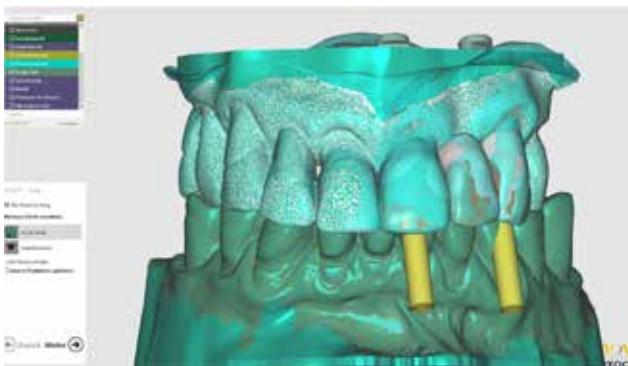
With a new import of the data into exocad, the lab technician milled a PMMA provisional bridge. The fit was verified using a control model printed by Dreve 3D model printing services.



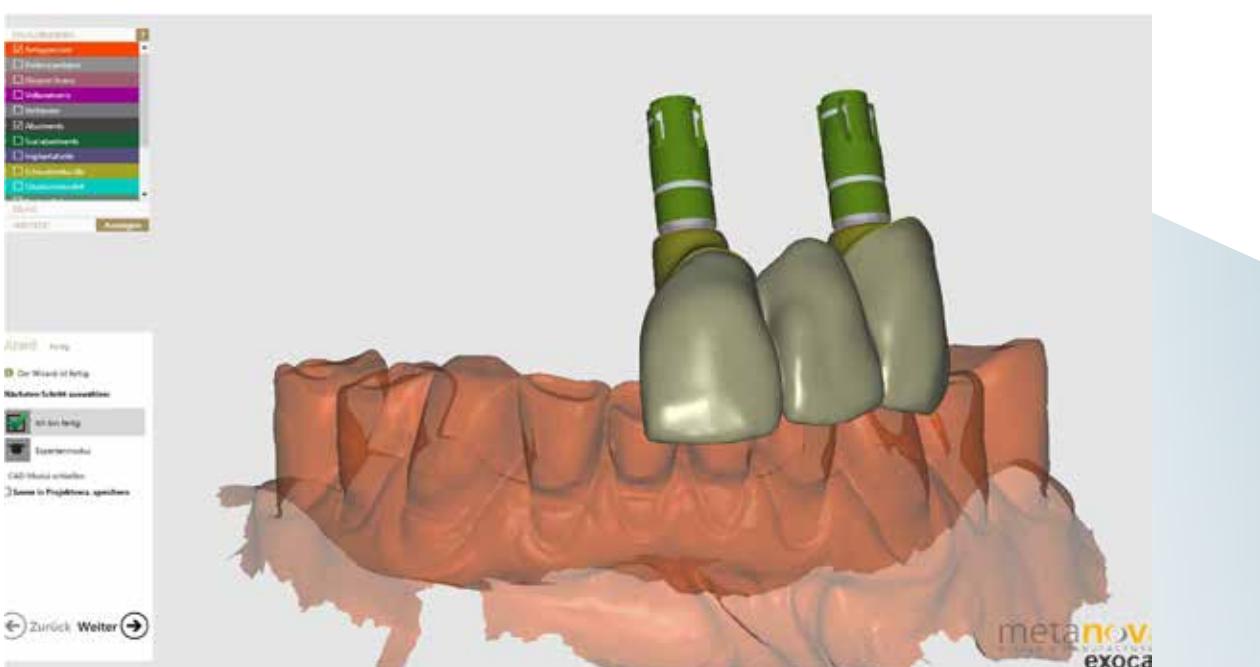
Export of the STL data of the scan body, model and wax up



Left, import of the STL data of the scan body, model and wax up in exocad right, export of the virtual scan bodies via STL data



Left, view of the virtual wax-up with the planned implants in exocad software, right showing import of the virtual scan bodies via STL data



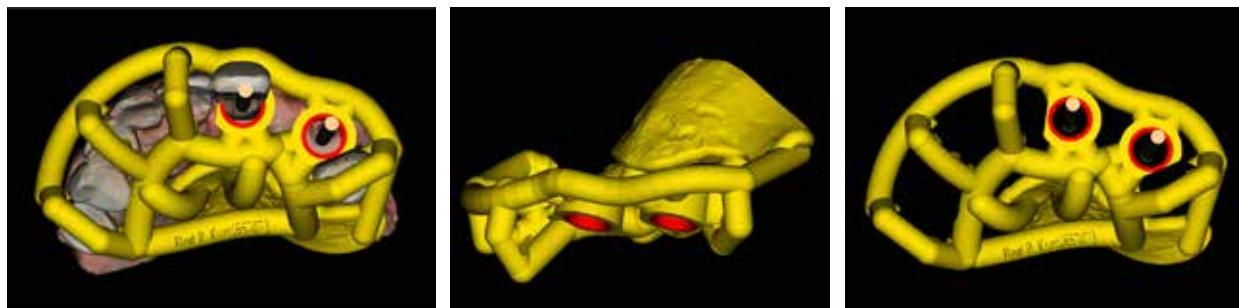
Design of the provisional bridge in exocad



Fully digitally designed provisional bridge on control model

Two temporary cylindrical abutments were modified with Opaquer.

Meanwhile, the surgical guide was designed in SMOP and then printed with a Stratasys 260 printer using medically approved M 610 material. The fit was verified using the Dreve control model.



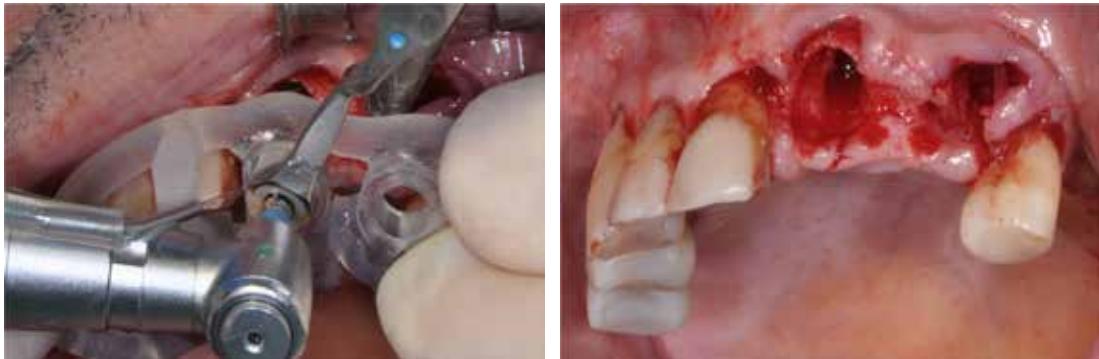
Surgical guide design in SMOP software



Surgical guide printed using Stratasys printer and placed on the Dreve control model

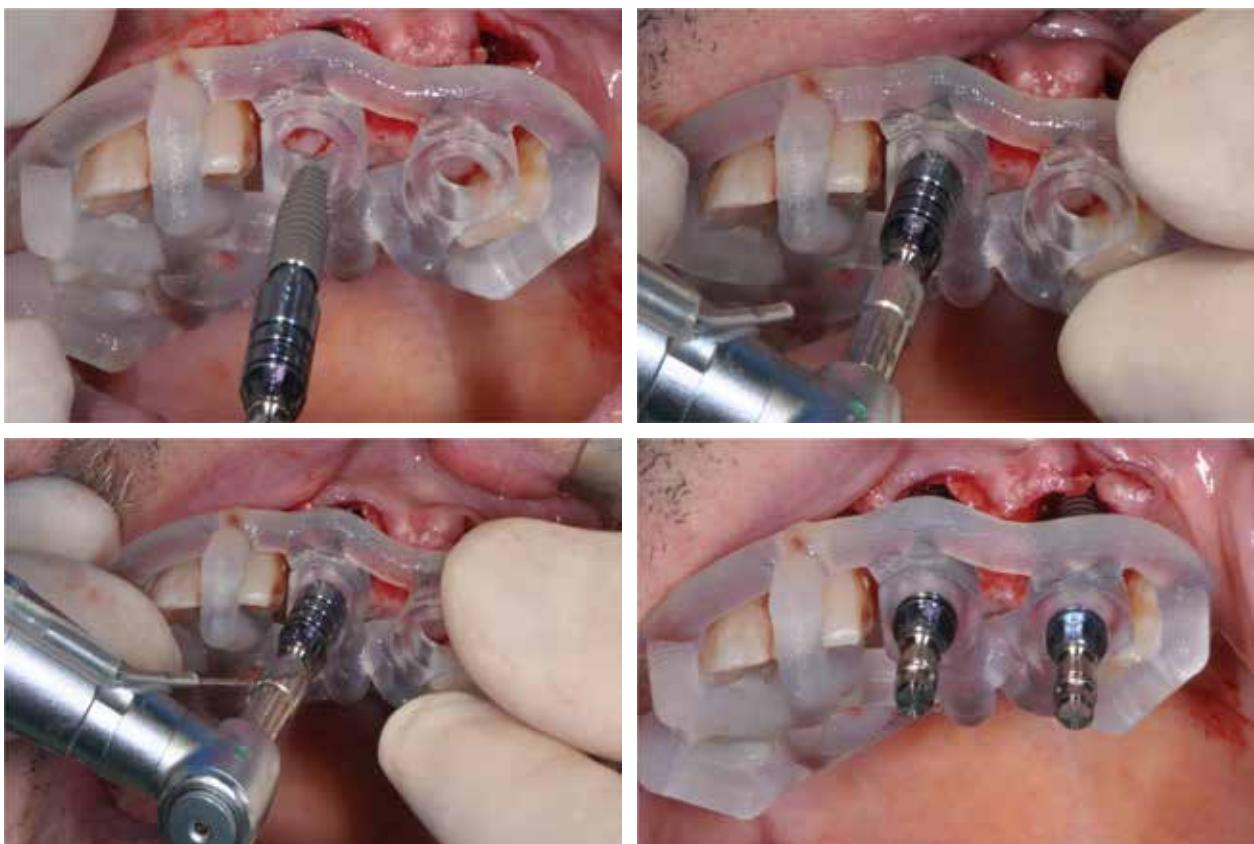
SURGERY

The two fractured teeth 21 and 23 were removed under local anesthesia, and a Straumann-guided surgery kit was used to perform the osteotomy of the implants.



Removal of teeth 21 and 23 and osteotomy of the implants

Two Straumann BLT RC SLActive 4.1mm,12mm implants were placed using a surgical guide. Both ISQ values were above 65.



Implant placement using a surgical guide

Next, the provisional PMMA bridge was cemented onto the two temporary cylindric abutments.



Placement of screw-retained provisional PMMA bridge



Final suture placement

The bone defects were filled with Bio-Oss and covered with a double layer of Bio-Gide, both materials from Geistlich.

The occlusal contacts of the bridge were adjusted to improve the overall occlusion and contact pattern of the patient's teeth.

The patient was prescribed Amoxicillin and Clavulan acid for 7 days postoperative as infection prophylaxis and ibuprofen as painkiller. Additionally, Chlorhexidin 0.2 % as an oral rinse.

Suture removal was performed at the first control appointment one week post-surgery.

After three months, the referring dentist placed the final screw-retained full zirconia bridge.

The final control radiographs and the post-healing photographs were completed in my practice, with a satisfactory final outcome and a very happy patient.



Post-healing radiograph



Final intraoral photographs



Final extraoral photographs

BENEFITS OF A DIGITAL WORKFLOW

I have found that using digital technology offers a number of advantages for both my patients and my practice. For example, capturing an impression digitally saves time by reducing errors in the impression acquisition and by eliminating the need for stone model pour-up. And, because the CS 3600 intraoral scanner produces open digital files, they can be easily sent to the lab via digital file transfer for faster fabrication and improved communication.

CLOSING REMARKS

Dr. Beat R. Kurt would like to extend his gratitude to the team who worked together to complete this case including his practice staff, his dental technician, Andreas Schwab, Baar and his referring general dentist Dr. Reto Sütterlin.