

CLINICAL CASE

Single Unit Case Using SMOP Guided Surgery Planning with Thommen Medical Implant System

CS 8100 3D, Prosthetic-Driving Implant Planning Module
and SMOP by Swissmeda

by Dr. Mathieu Rousset

Single Unit Case—Tooth #23

A patient presented with an agenesis on teeth #24 and #22. They had received orthodontic treatment and #22 had been previously removed, but not replaced. Therefore, tooth #23 had shifted too much so the decision was made to extract it and place an implant.

Digital impressions were taken using an intraoral scanner. Then, a 3D volume was captured using the CS 8100 3D system. The CBCT image confirmed resorption on tooth #23.



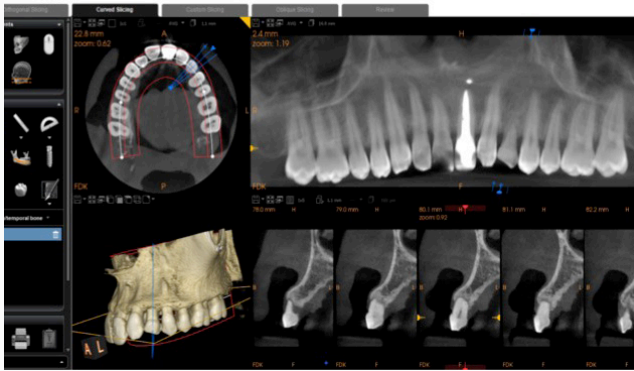
Initial situation



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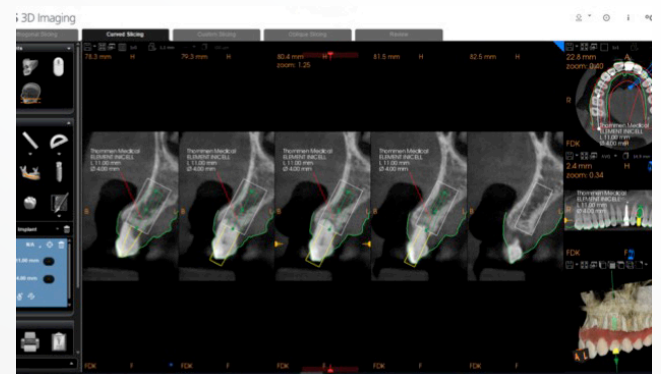


Digital impression captured with an intraoral scanner



CBCT analysis within CS 3D Imaging software

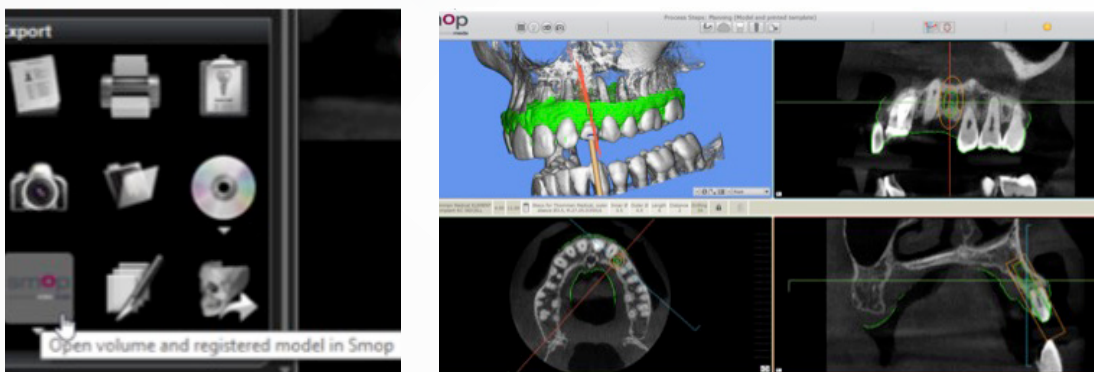
The CBCT volume was automatically merged with the soft tissue scan of the digital impression using the Prosthetic-Driven Implant Planning module in CS 3D Imaging software to perform virtual crown-down implant planning. Thanks to its large implant library, I was able to easily choose and properly position the ideal implant shape directly within the CS 3D Imaging software according to the restorative axis and bone volume available.



Prosthetic-Driven Implant Planning module automatically merging hard and soft tissues

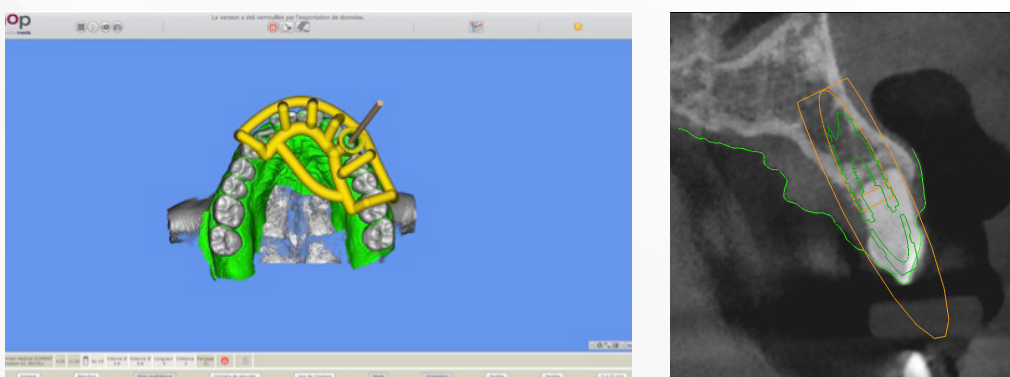
Then, the prosthetic driven planning analysis, including the recorded 3D volume with the digital impression as well as the implant position and references, was easily transferred from CS 3D Imaging to the SMOP guided surgery software with a single click. This streamlined workflow saves time since there is no need to:

- Load the 3D volume and digital impression in SMOP software
- Manually record the 3D volume with the digital impression using corresponding markers
- Plan the implant in the SMOP software again



Planning transferred from CS 3D Imaging software to SMOP software

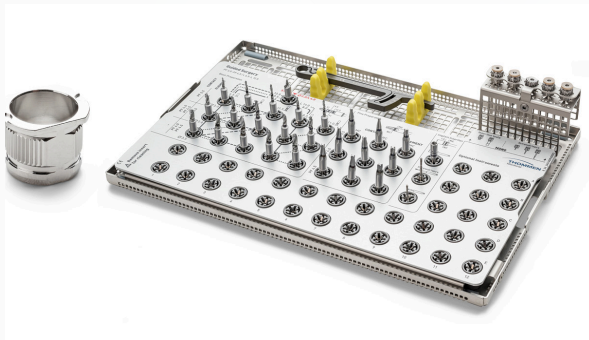
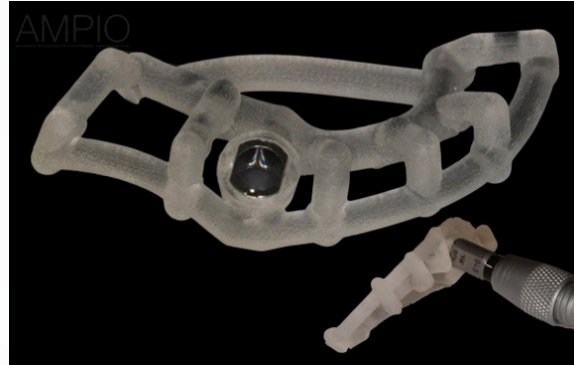
After this step, a surgical guide was designed by the SMOP service center using SMOP software and printed on a 3D printer in the SMOP Service Center. The surgical guide was shipped back to Dr. Rousset, along with a Thommen guided surgery sleeve compatible with the Thommen Medical guided surgery kit.



Surgical guide designed in SMOP software



Printed surgical guide



Thommen medical guided surgery kit

On the day of surgery, tooth #23 was extracted. The tooth-supported surgical guide was placed and the seat of the guide checked on the remaining adjacent teeth.

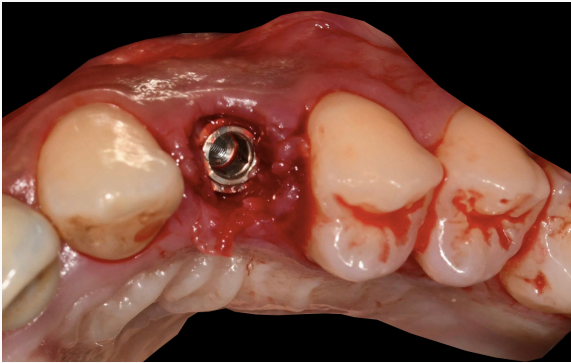
The SMOP guide design provided several advantages, as the adjacent teeth were not completely covered by the resin. It also enabled:

- Full visibility of the site
- Better control of the fit, which ensures the guide has been properly seated
- Easier cooling during drilling sequences
- Improved accessibility for surgical instrument insertion



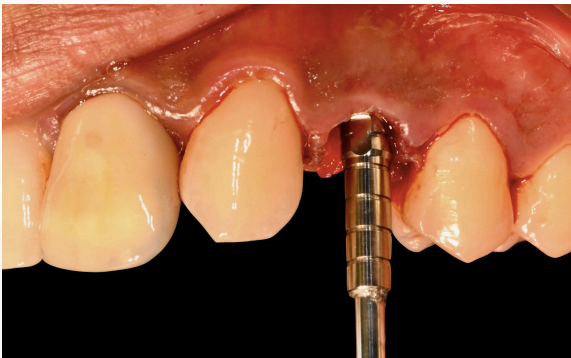
Drilling sequences

An ELEMENT RC, PF 4.0, 11 mm Inicell implant (Thommen Medical)) was placed. Its superhydrophilic surface promotes rapid osseointegration due instant bioavailability^{1,2}.

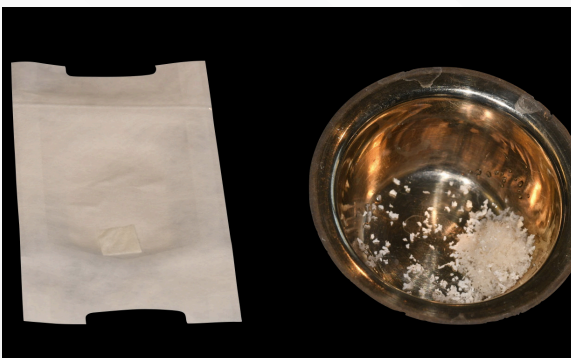


Three-dimensional implant position is identical to the 3D implant planning

For a screw-retained temporary restoration the VARIOtemp abutment (Cp- Ti) was placed. The abutment height is adaptable according to the clinical situation and comes in a corresponding CAD/CAM library for best preoperative planning. A tunneling technique was used to encourage bone regeneration and to maintain the papillae.



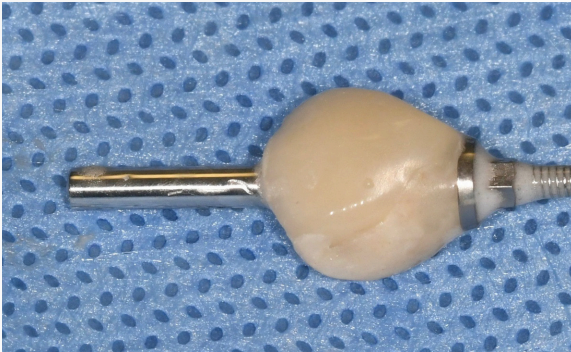
Then, the collagen membrane (Smartbrane REGEDENT) was installed using a hydroxyapatite of porcine origin (The Graft REGEDENT).



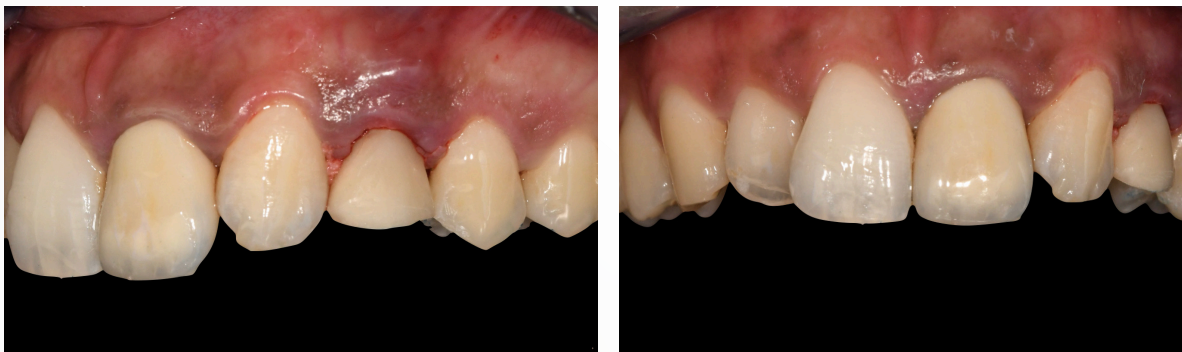
Installation of the collagen membrane

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The temporary crown was solidarized to the Variotemp abutment with resin; the provisional had been designed by the lab technician using Dentalwings Software and milled.



The screw retained temporary crown was finally placed and the crown seated.



About the Author



**Dr. Mathieu
Rousset**

- Doctor of Dental Surgery
- Certificate of Advanced Study of Biomaterials used in Dentistry
- Certificate of Higher Education in Surgical Dentistry
- Certificate of University Study of Maxillo-Facial Imaging
- Certificate of University Study in Periodontology
- University degree in CAD/CAM
- Inter-European University Diploma in Implantology

Other positions:

- EMS speaker
- Founder and director of AMPIO (Training Association of Periodontology and Implantology).
- Key opinion leader with THOMMEN
- Exclusive exercise in periodontology and implantology

Publications:

« Mise en charge immédiate : A propos d'un cas clinique».

Stratégie Prothétique : juin 2006 . vol 6, n° 3

Hand in hand : Practice meets industry (European journal for dental implantologist 2/2018)

L'empreinte optique en implantologie (Dentoscope n°197 26/09/2018)

Websites:

- Mathieu-Rousset-Chirurgien-Dentiste.fr
- Ampioformation.com

¹Calvo-Guirado, J.L., et al., Histological and histomorphometric evaluation of immediate implant placement on a dog model with a new implant surface treatment. Clin Oral Implants Res, 2010. 21(3): p. 308-15.

²Hinkle, R.M., et al., Loading of titanium implants with hydrophilic endosteal surface 3 weeks after insertion: clinical and radiological outcome of a 12-month prospective clinical trial. J Oral Maxillofac Surg, 2014. 72(8): p. 1495-502.