Professor in the Department
of Restorative Dentistry at UFMG
Dr. Nelson Silva

Single implant –upper premolar replacement using digital workflow

Solutions featured:

3Shape TRIOS
3Shape Dental System
3Shape Implant Studio

3shape

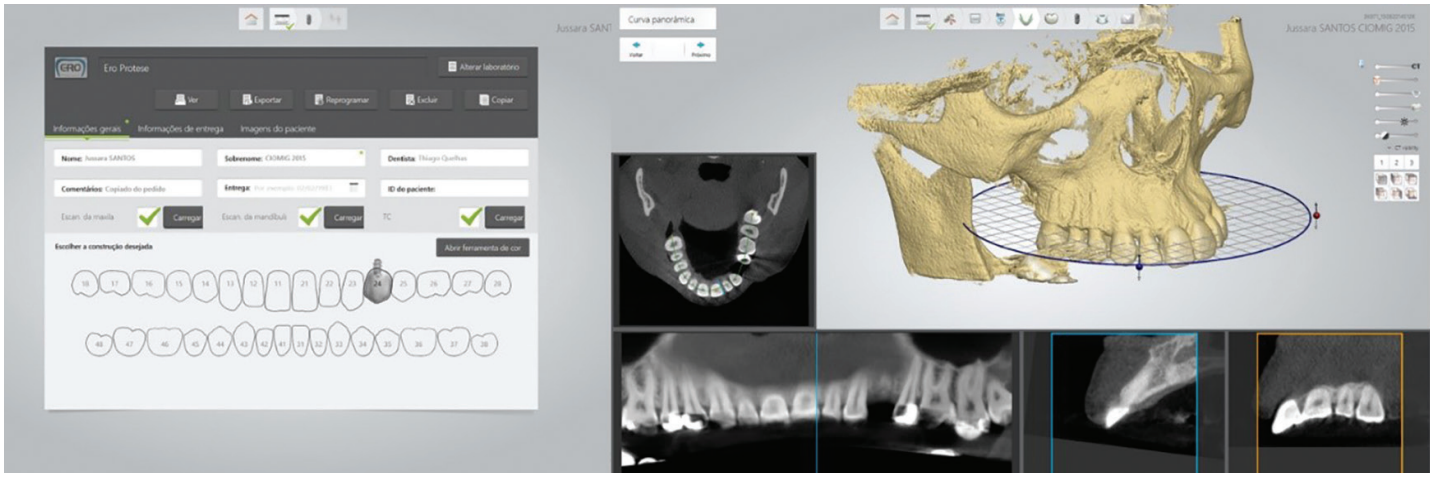
Case Information

For aesthetic and functional rehabilitation of upper Premolar (#24), Dr. Nelson used the TRIOS® intraoral scanner and 3Shape's Implant Studio® software for the implant planning and designing of the surgical guide, as well Dental System™ for the making of the final prosthesis.

The digital implant workflow for Dr. Nelson

Initially the patient information was entered in the system and the digital impressions from TRIOS and the CT scans were loaded. The tooth of interest was selected for the reverse prosthesis planning and subsequent implant planning. A surgical guide has been designed and manufactured to provide precision and predictability in the surgery. Finally, the implant abutment was selected and the crown was made with the Dental System software.

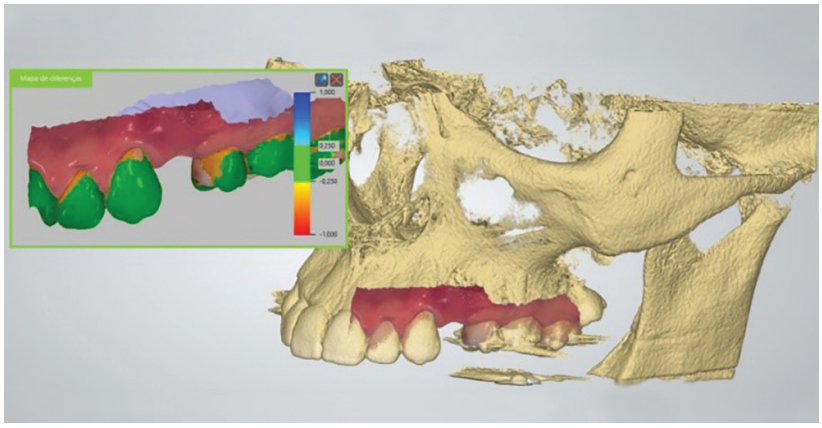
For aesthetic and functional rehabilitation of upper Premolar (#24)

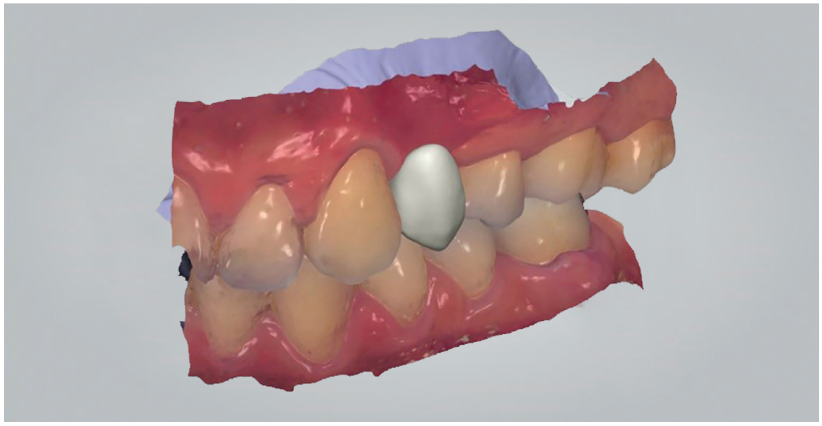


The patient J. L. S., 35 years old, female, attended the Brazilian Association of Dentistry of Sete Lagoas/MG, for aesthetic and functional rehabilitation of one upper Premolar (#24). Her general health history did not show changes that contraindicated the rehabilitation through implants. It was discussed with the patient the necessity of a possible graft to improve the vestibular structure of the given region, but the patient wasn't interested in the procedure.

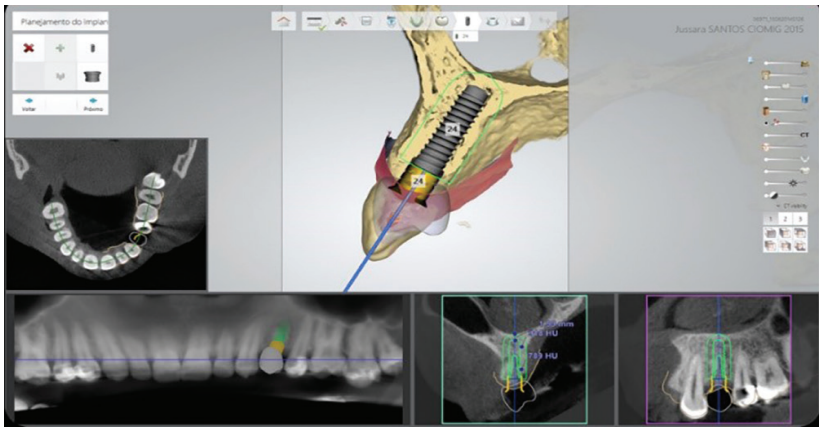
The patient information was entered in the system and the digital impressions from TRIOS and the CT scans were loaded in the Implant Studio session window. The tooth of interest was selected for the reverse prosthesis planning and subsequent implant planning.

Please note that the CT file uploaded to Implant Studio allows for an overall assessment of the case, as well as specific sections of it, demonstrated in the following.

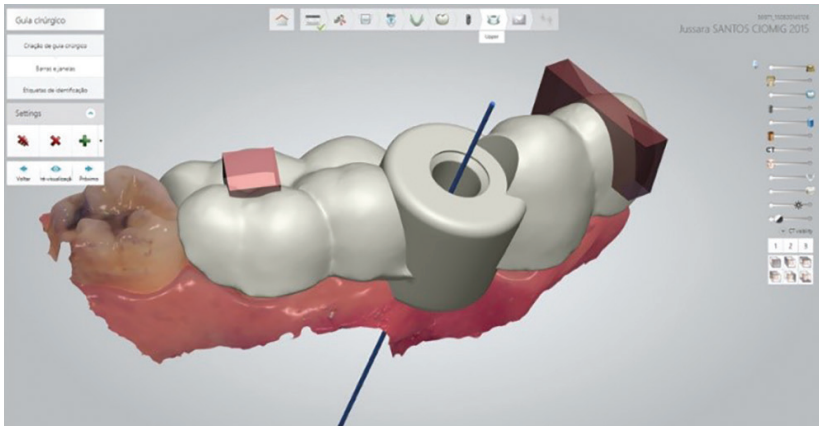




Then, the CT and the intraoral scanning were aligned. To check the alignment, the system offers a color scale, which makes it possible to quantify the accuracy of this alignment. The first step for the implant planning is the virtual wax-up of the related tooth, which will guide the planning of the implant position and subsequent design of the surgical guide.



With the virtual wax-up set, the positioning of the implant in 3D is planned. Implant Studio has accurate and optimized positioning and visualization tools.



After the implant placement, the surgical guide is designed and customized for each case. Subsequently, the digital file of the guide is sent (on a STL format) to be prototyped or milled in an optimal and precise way.

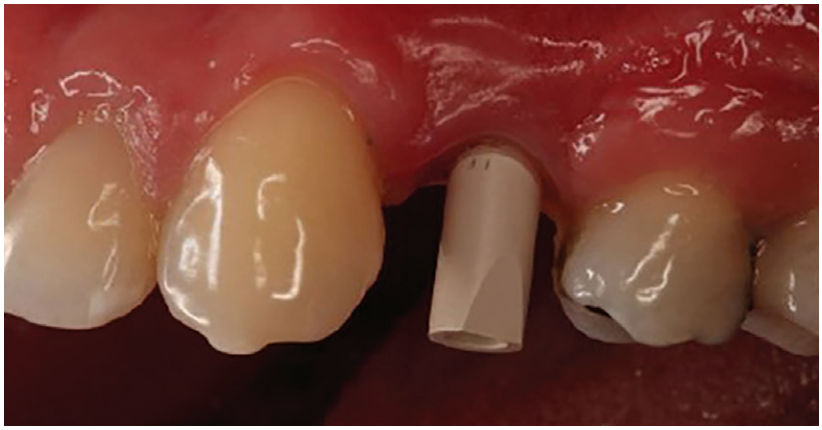
A

B

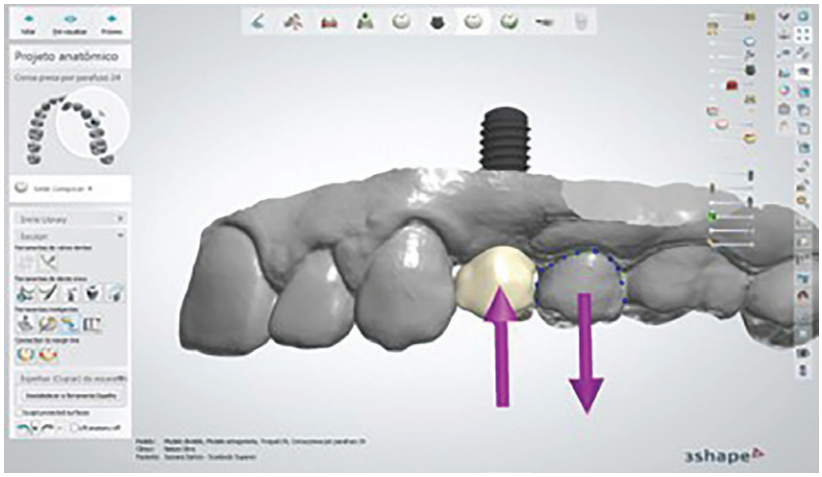
C

D

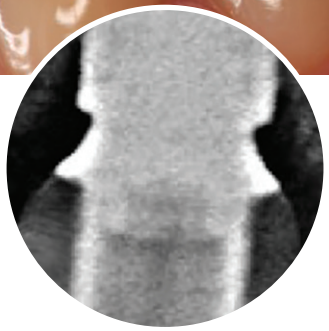
By looking at this picture, you can see the milled surgical guide in “A” and the prototyped in “B”. Observe that in this example the guide that was milled offers a greater translucency, but the decision to use one or the other depends on the working philosophy adopted. In addition, it is possibleto show that regardless of the method of manufacturing the guide, it has accurate and stable fit for the surgery. In the picture “C”, it is possible to see the implant with the healing abutment placed and in the picture “D” you can see the emergency profile set for aesthetic optimization.



To register the implant position and the crown manufacturing, a scanbody was attached to the implant and its scanning was performed with the TRIOS. After scanning, the 3D images were designed in the Dental System software, with the purpose of starting the designing of the crown.



Crown placement and digital adjustment of proximal and occlusal contacts, in order to mill the crown with CAD/CAM technology. In this particular case, it was decided to copy the anatomical shape of the second premolar to re-establish a better aesthetics and functionality for the patient.



Implant and crown attached with precise fit, restoring aesthetics and function of the patient. Observe the similarity of the shape obtained when compared to the second premolar, showing the software great capacity of mimicking the anatomical details.

About Dr. Nelson

Dr. Nelson is a Professor in the Department of Restorative Dentistry at UFMG, Prosthesis Specialist – CEO IPSEMG, he has a Master's degree in Oral Rehabilitation – FOB USP, a PhD in Oral Rehabilitation – FOB USP/New York University, a Post-doctorate in Biomaterials, New York University, USA. He served as an Assistant and Associate Professor at the New York University, USA 2002-2012.

Dr. Nelson acts today in projects to optimize the use of CAD/CAM by professionals in all dentistry segments.

Implant Studio benefits to Dr. Nelson

Implant Studio is a diagnostic and treatment planning tool extremely accurate and easy to operate. In the case presented here, the combination of Implant Studio with Dental System to manufacture the prosthesis has generated a predictability on the execution, from the correct positioning of the implant to the restoration placement.

About 3Shape

3Shape is changing dentistry together with dental professionals across the world by developing innovations that provide superior dental care for patients. Our portfolio of 3D scanners and CAD/CAM software solutions for the dental industry includes the multiple award-winning 3Shape TRIOS® intraoral scanner, the 3Shape X1® CBCT scanner, as well as market-leading scanning and design software solutions for both dental practices and labs.

Two graduate students founded 3Shape in Denmark's capital in the year 2000. Today, 3Shape employees serve customers in over 100 countries from 3Shape offices around the world. 3Shape's products and innovations continue to challenge traditional methods, enabling dental professionals to treat more patients more effectively.

Let's change dentistry together

www.3shape.com

3shape