

Virtual Tooth Extraction

Using the Correct Optical Impressions feature to remove a tooth from a digital model.

By Tom Nieting, CDT

With today's digital technology, clinicians and laboratory technicians are learning how to make even the smallest details appear on their computer screen. However, it's not always about what you can make appear. Sometimes, it's about what you can make disappear.

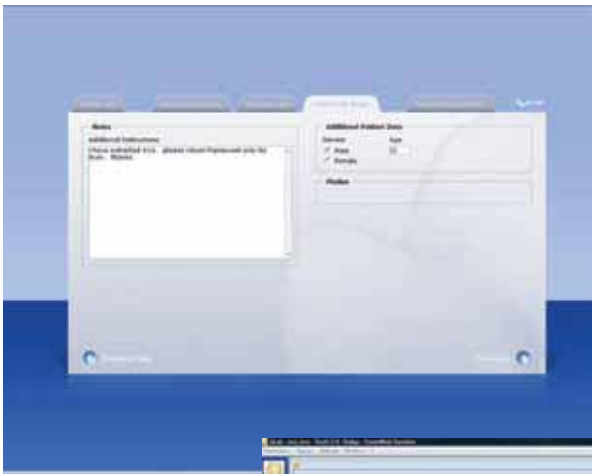


Figure 1. (above)
The additional notes field in the digital prescription was filled out stating that the tooth has been extracted.

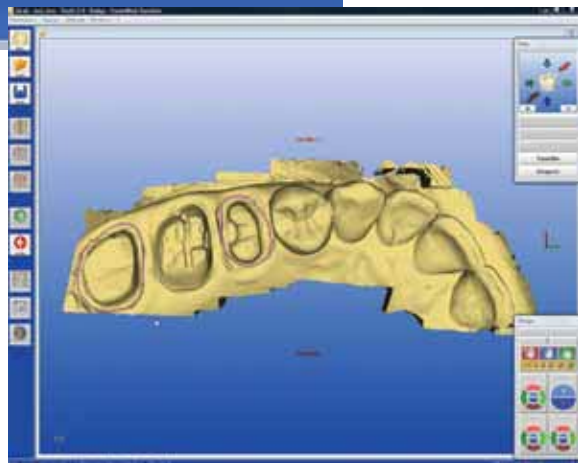


Figure 2. (right)
The original digital impression with the models drawn.

Take, for example, this case that shows a bridge received through CEREC Connect from a doctor with abutments on the second premolar and second molar. The doctor uploaded this case with tooth No. 3 still intact and planned on extracting it later (**Figures 1 and 2**). The doctor requested that the tooth be digitally removed and an ovoid pontic be created in the socket area.

With CEREC Connect a doctor can very easily create a digital impression and upload it to the laboratory. Using the Correct Optical Impressions software feature allows a laboratory technician to make necessary changes to the model without having to ask the doctor to create another digital impression. If we tried to design on top of tooth No. 3, the software would not be able to create a pontic in that area. We therefore had to develop a technique to go forward from the doctor's actual scan and use the margins that the doctor had drawn.

First, a patient file was created and we chose to manufacture the bridge (**Figure 3**) using zirconia. The spacer and gingival spacer were set in the parameters window (**Figure 4**). The gingival spacer parameter was set into the negative to make sure that the pontic was as close to the tissue as

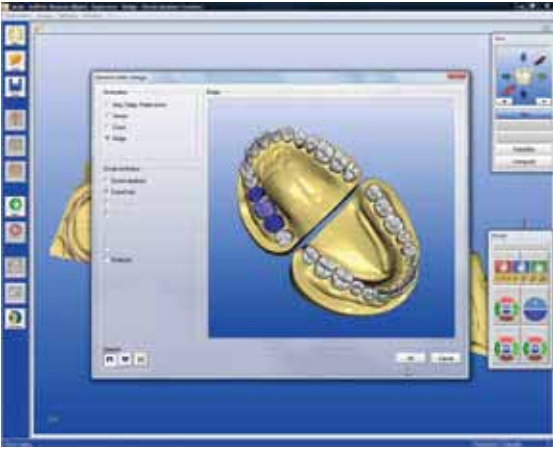


Figure 3. (far left)
Defining restoration
type, design technique
and tooth numbers.

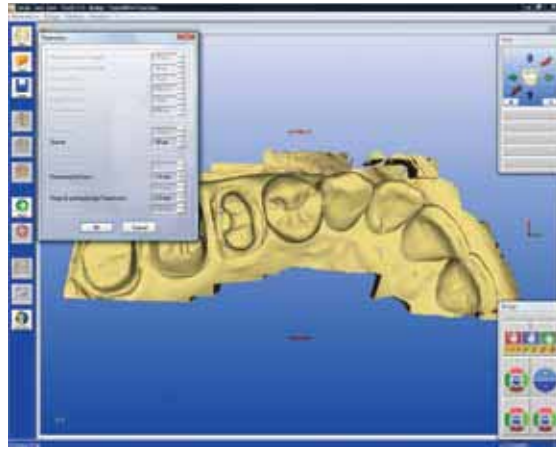


Figure 4. (left)
Definition of parameter
settings.

possible. The software then asked for the margins. At that point, the undo button was clicked and the margins were removed from the model. We then clicked on design and selected correct optical impressions (Figure 5). We rotated the model in place to have a good cross view of each tooth and selected cut inside from the Correct Optical Impressions window (Figure 6). Because we wanted to remove this tooth from the software virtually, we start by laying down a double click and followed along the height of the tissue (Figure 7). Once the area that we want to cut away was encircled, we finished with a double click and the software cut the selected area away. Now the tooth was virtually extracted from the digital model (Figure 8).

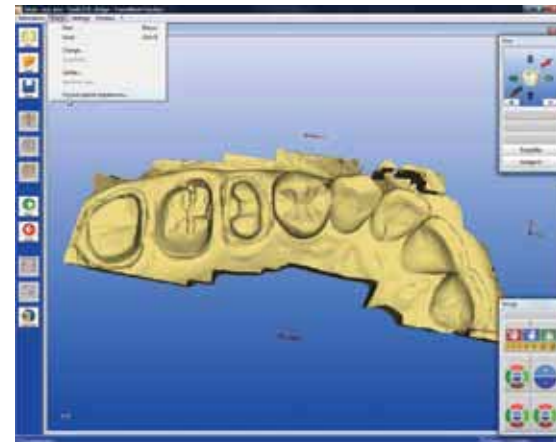
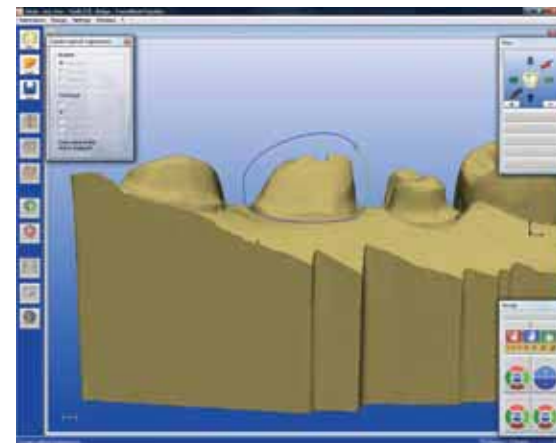


Figure 5. (left)
Correct Optical
Impression window.

Figure 6. (below)
Definition of Correct
Optical Impression
technique.

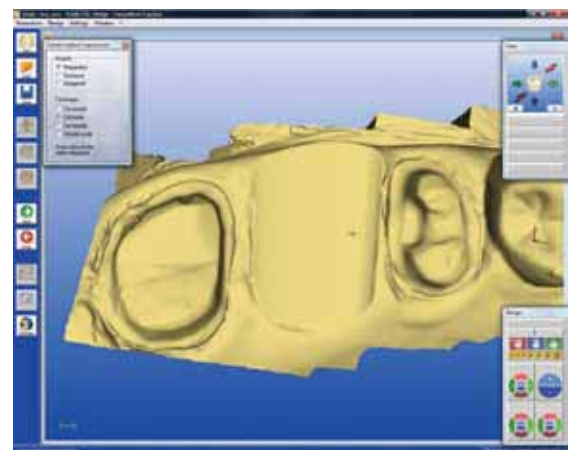


It's important to remember when using this tool that the information is being cut away on a 3D image so when viewing the model the line that is drawn affects the area throughout the entire buccal-lingual area of the model. Be careful not to draw a line in such a way that any necessary data is removed where a part of the margin area could be cut away (Figure 9).

Figure 7. (above)
Virtual tooth extraction.

Once the tooth had been removed, we closed out the Correct Optical Impression window and arrowed forward. On the bottom toolbar, the software asked for the preparation margin for tooth No. 2. When we clicked on the margin, the doctor's original margin came back in place and the software then asked for a baseline for tooth No. 3, the pontic area. After drawing the pontic, the software asked for a margin for tooth No. 4 (Figure 10).

Figure 8. (right)
Digital model with virtually
extracted tooth.



At this point, we saved and exported the file to the desktop. We then went back to the CEREC Connect order list, re-opened this case and went forward to the tab where a model was being

ordered. The browse button was clicked and the file that we order the model from was selected right from the desktop. The reason for ordering the model from the file saved to the desktop is that this was the file where the tooth has been extracted. So, the new digital impression is the model that should be ordered from Sirona's infiniDent model fabrication service.

The design process was completed up to the milling preview and the software had designed the bridge properly and created a nice ovoid pontic for

Figure 9. (below)
Positioning of digital model for extraction.

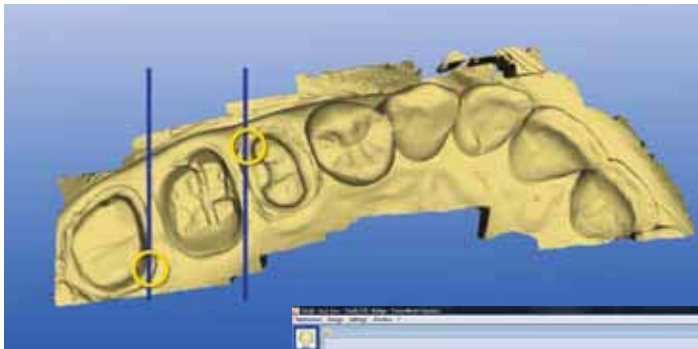


Figure 10. (right)
Definition of preparations and pontic.

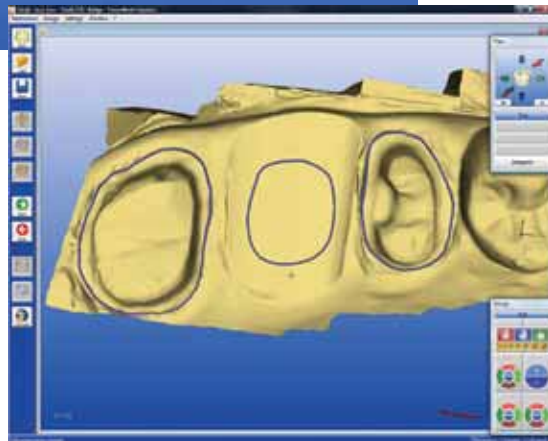


Figure 11. (below)
Lingual view of designed bridge-framework.

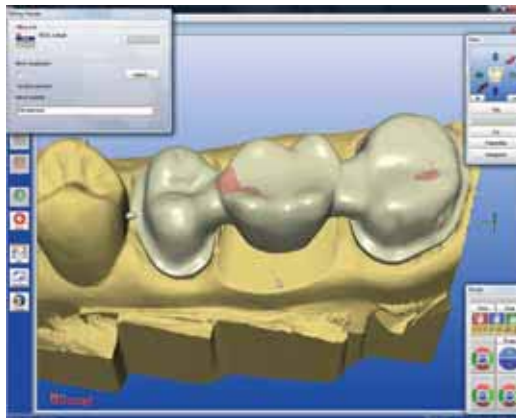
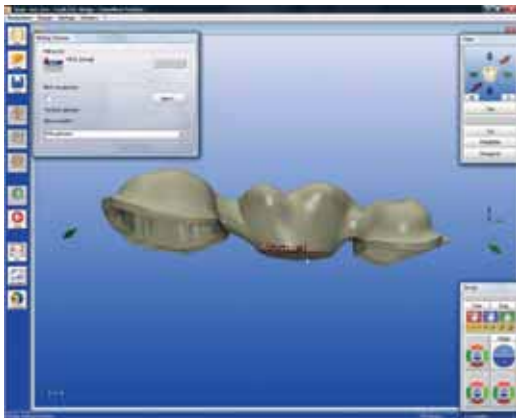


Figure 12. (left)
Buccal view of designed bridge-framework.

the patient (**Figures 11 and 12**). The restoration was milled and ceramic material was added to the tissue side of the pontic. By using this technique, we did not have to call the doctor up and ask them to create another digital impression and by keeping the original scan that the doctor sent, the same margins that the doctor laid down can be utilized to design the bridge.

As laboratory technicians, we make teeth appear and disappear in the real world. Using today's digital technology, we can do the same in the digital realm. Now it's up to each of us to use virtual tools to improve our own skills in the here and now. 📍

About the Author:

Tom Nieting, CDT, is originally from the Midwest where he started his career in 1972 as a dental technician trainee and worked for more than 35 years as a Certified Dental Technician and ceramist. He was the general manager of Lemke Dental Lab, a 50-person, full-service laboratory in Minnesota. Nieting joined Sirona Dental Systems in Charlotte, N.C., in 2006 as the technical marketing manager for laboratory CAD/CAM and was in charge of education for the CEREC inLab system. He is the co-founder of DENTATRUST, LLC, located in Charlotte, N.C., the first dental laboratory



focusing entirely on dental CAD/CAM. He was the first CEREC inLab user and beta-tester in North-America and conducts CEREC advanced software trainings and lectures nationwide and internationally.

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“Virtual Tooth Extraction”

By: Tom Nieting, CDT
(Course #: 21093)

- It's not always about what you can make _____.
Sometimes it's about what you can make _____.
 - Appear, disappear
 - Disappear, appear
 - Reappear, disappear
- What tooth was still intact when the doctor uploaded the case?
 - No. 5
 - No. 4
 - No. 3
 - No. 2
- For this case the technician simply had to design on top of tooth No. 3.
 - True
 - False
- Zirconia was used to manufacture the bridge in this case.
 - True
 - False
- The gingival spacer parameter was set into the - _____ to make sure the pontic was as close to the tissue as possible.
 - Positive
 - Negative
 - Neutral
 - None of the above
- On the 3D image the line drawn only affects part of the buccal-lingual area of the model.
 - True
 - False
- The ability to fabricate bridges on the anterior teeth as far back as the second bicuspids allows for what?
 - Avoid the need for grinding
 - Wax-up accuracy
 - Less aggressive tooth preparation
 - Exact color match
- Once the tooth is removed virtually what does the software ask you to for?

The preparation margin on tooth No.2
- What is reason for ordering the model from the file saved to the desktop?
 - It is less expensive
 - It is the original file
 - It is the file where the tooth has been extracted
 - There is no particular reason
- Name one advantage of using this technique.
(Either of the following are correct)

Did not have to call the doctor for them to create another impression and the same margins the doctor used can be utilized to design the bridge.

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