Adding high-quality implant restorations to your digital armamentarium

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One of the significant advantages of the Planmeca FIT system is the ability to easily export your scans. This allows users to work with the dental laboratory to fabricate restorations that you aren’t able to create in the office. A restoration that lends itself to laboratory collaboration is an implant-supported full-coverage crown seated on a custom-milled titanium abutment.

There are many advantages to fabricating a milled custom abutment vs. working with a stock abutment. By fabricating a custom abutment, one is able to create a proper emergence profile on the abutment and place the restorative margin ideally to aid in cement cleanup. A milled titanium abutment is also extremely strong and can be designed to provide ideal thickness of the final restoration.

Historically, custom abutment-supported implant restorations were fabricated by taking a fixture level impression and shipping the impression to the dental laboratory for fabrication of the abutment and crown. While this yielded excellent results, each restoration was quite costly and took a fair bit of time for the lab to fabricate.

Utilizing the Planmeca FIT (Planmeca/E4D Technologies) system and the DDX laboratory portal (Henry Schein Inc.), dentists who utilize CAD/CAM technology are able to reduce lab turnaround time and fabricate the final crown in office, drastically reducing the costs.

This is accomplished by utilizing a scan body to digitally capture the implant position using the Plan-scan (Planmeca/E4D Technologies) (Fig. 1).

Scan bodies are available from many labs and implant manufacturers. The scan bodies used for this case were obtained from 5 Axis Dental Laboratory (5 Axis Dental Laboratory, Whitby, Ontario).

STL files are exported to the laboratory via the secure, HIPAA-compliant DDX network, which allows the case to be in the laboratories’ hands almost instantly. The final restoration is fabricated on a printed model provided by the laboratory in the of-
The workflow is very straightforward and will allow the office to easily fabricate the final crown using familiar techniques with a few changes vs. a tooth-borne crown.

**Case presentation**

A patient presented to our office for fabrication of a definitive restoration in the #30 area. A Straumann RC bone level implant (Straumann USA) had been placed and integration confirmed by the surgeon.

In order to make scanning the proximal surfaces easier, a pre-op scan was taken with the healing abutment in place (Fig. 2).

The healing abutment was removed, and the matching scan body was screwed into place, taking care to orient the flat portion of the scan body as facially as possible. This flat portion of the scan body is critical for the software to locate the implant position.

There will be times that you are unable to fully record the proximal portions of the scan body. These areas aren’t as critical so a bit of missing data here is acceptable. Also, the scan body can be slightly adjusted proximally if needed to allow the scan body to seat properly.

Time saver was then used, erasing the healing abutment, and then scanning in the scan body, taking care to ensure the flat portion was accurately recorded (Fig. 3). Opposing and a buccal bite were then acquired.

In some instances you will need to remove the scan body prior to capturing the bite. Depending on the depth of placement, the scan body may impact the opposing dentition, so take care to evaluate the position before having the patient close.

Either way, the software will have plenty of data to align the bite.

Close the case and once the file has saved, click the plus button next to your case to expand the list of files. Click the DDX export button (Fig. 4), which will take you online to the DDX portal. From the lab list, select the laboratory you wish to use and you will bring up its lab prescription form (Fig. 5).

Fill out the details for the digital prescription; the patient name will transfer over to the online form. From there, indicate the implant type, desired material for the abutment and any applicable surface finish.

Dentists will also be able to indicate how they prefer the restorative margin be placed relative to the tissue. Typically, settings would be to have the facial margin 1.5 mm subgingival, the proximal margins equigingival and the lingual slightly supra gingival.

The laboratory returns the abutment and screw along with a printed model with an aluminum analog (Fig. 6).
The printed model is scanned using the Planscan (Fig. 7). To ensure the abutment color is properly blocked out, an emax LT block (Ivoclar/Vivadent) should be used to fabricate the final restoration. Emax has the strength to be conventionally cemented provided the occlusal thickness is 2 mm or more.

Because the milled custom is shaped essentially like a natural tooth, preparation fabrication of the final restoration is completed in much the same fashion as any natural tooth. The only exception is margin ramp and axial spacer settings. As the abutment generally has ideal taper and contours, I will set the margin ramp at .5 and the axial spacer at .05 (Fig. 8).

Also always perform a mill simulation in detailed mode to ensure there is no internal binding of the restoration.

The easiest way to check for interference is to simply flip the simulation screen over and check to see if any blue bleeds through in the axial areas (Fig. 9).

If any blue bleeds through the tan model, go back to the design screen and open the axial setting by .01 and simulate again. Keep nudging the spacer out until you get the tightest fit without interference.

An excellent-fitting crown is produced by the mill with extremely accurate margins (Fig. 10).

Proximal and occlusal contacts are evaluated on the printed model/analog and adjusted as needed while the emax is in the purple phase.

The restoration is stained and glazed in the same manner as a tooth-retained crown (Fig. 11).

One of the big advantages of using emax for an implant restoration vs a layered restoration is the reduction in fracture potential. Traditional layered ceramics are more prone to chipping in implant ap-

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plications as they are rigid structures, not cushioned by a periodontal ligament as natural teeth are.

The abutment is inserted and torqued to 35 Ncm (Fig. 12).

Teflon tape is placed into the screw hole access prior to cementing the final crown to prevent cement from entering the top of the screw. A radiograph is taken to ensure the abutment is properly seated (Fig. 13).

The emax crown is cemented with Fuji 2 RMGI cement (GC America), and clean up of excess is performed with a rubber tip and floss. The final restoration will provide the patient years of service (Fig. 14).

**Conclusion**

The open source nature of the Planmeca FIT system allows users the flexibility to utilize their systems in a variety of workflows to provide care for our patients.

This case provides an easy-to-follow workflow that will allow offices to add high-quality implant restorations to their digital armamentarium.

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**About the Author**

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**Fig. 11.** Glazed crown.

**Fig. 12.** Milled abutment follows the tissue contour.

**Fig. 13.** Radiographically you can see the emergence profile ideally created on the milled abutment.

**Fig. 14.** Final restoration in place.