

# Stories from the Front Lines: Teaching with Technology During COVID

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**THANKS To** the Faculty Center for Teaching and Learning  
and the School of Nursing

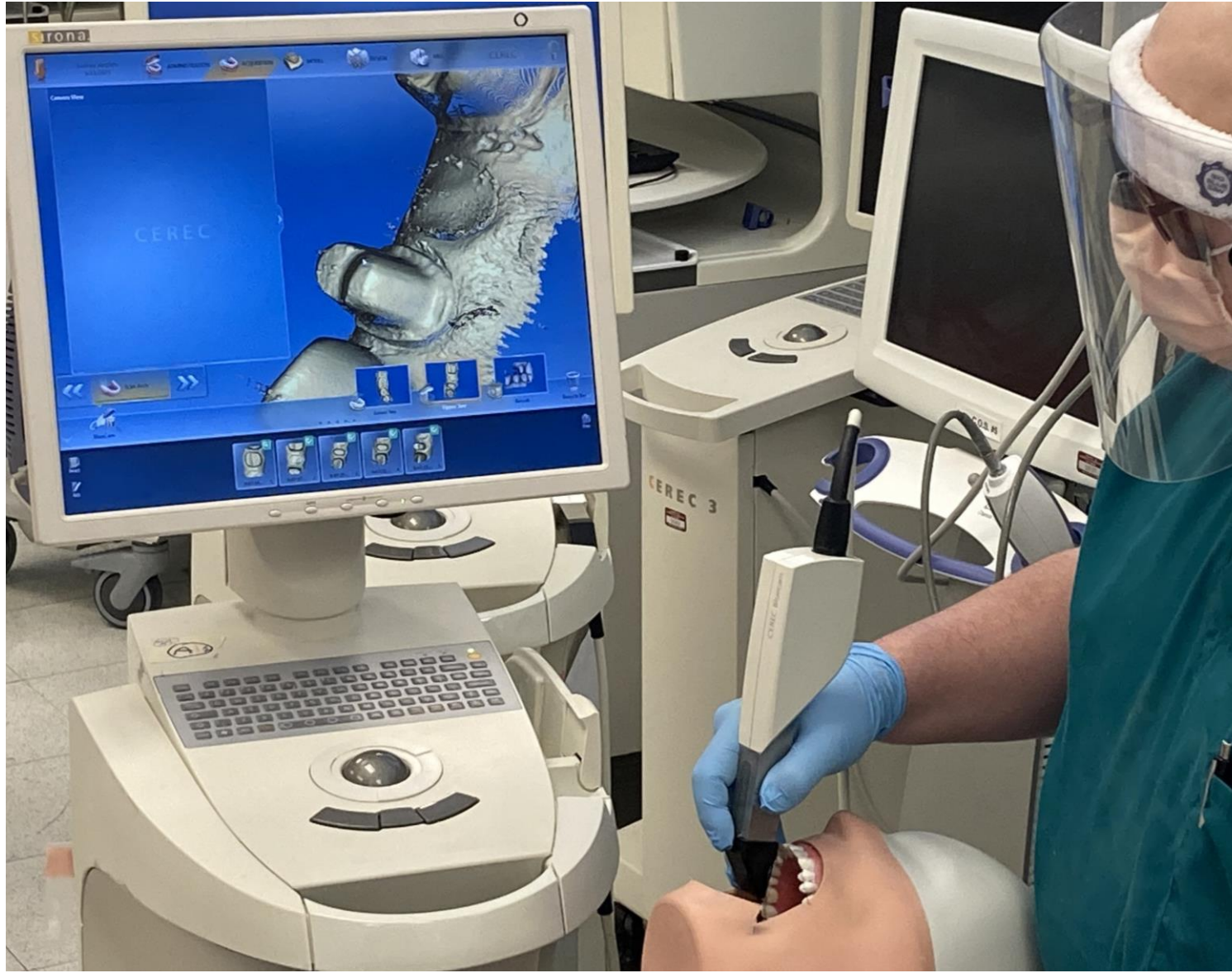
## Session 5: Using Technology During the Pandemic: Computer-Aided Design and Manufacturing (CAD/CAM) & 3-D Printing in Dental Education

**As a result of the limitations posed by the COVID-19 Pandemic, the University of Maryland School Of Dentistry (UMSOD) developed a series of “Alternative Experiences”, utilizing cutting-edge digital technology, to supplement the available clinical experiences of their senior dental students.**

# Utilizing Technology During The Pandemic: Computer-Aided Design and Manufacturing (CAD/CAM) & 3-D Printing

As a result of the limitations posed by the COVID-19 Pandemic, the University of Maryland School of Dentistry (UMSOD) developed a series of “Alternative Experiences”, utilizing cutting-edge technology, to supplement the available clinical experiences of their senior dental students. Students prepared a 3-unit fixed bridge on a typodont in the patient clinic under strict supervision. Once the crown preparations were approved by the supervising Prosthodontic Faculty as being clinically acceptable, the students next scheduled a session in the school’s CAD/CAM Center. During this next experience, the students digitally scanned their crown preparations using an intraoral scanner and then designed a digital dental crown utilizing the scanners designing software. The digital scans were then sent to a milling unit and crowns were fabricated from a block of 3-D printed acrylic. Next the students scheduled another appointment in the patient clinic where they adhesively bonded the milled dental restoration onto the “patient’s tooth” under supervision. As ceramic clinical blocks are expensive, the school digitally scanned one of the ceramic blocks and 3-D printed acrylic blocks costing pennies per block. This innovative use of 3-D printing technology saved the school thousands of dollars. The entire experience was well received and greatly appreciated by the students.

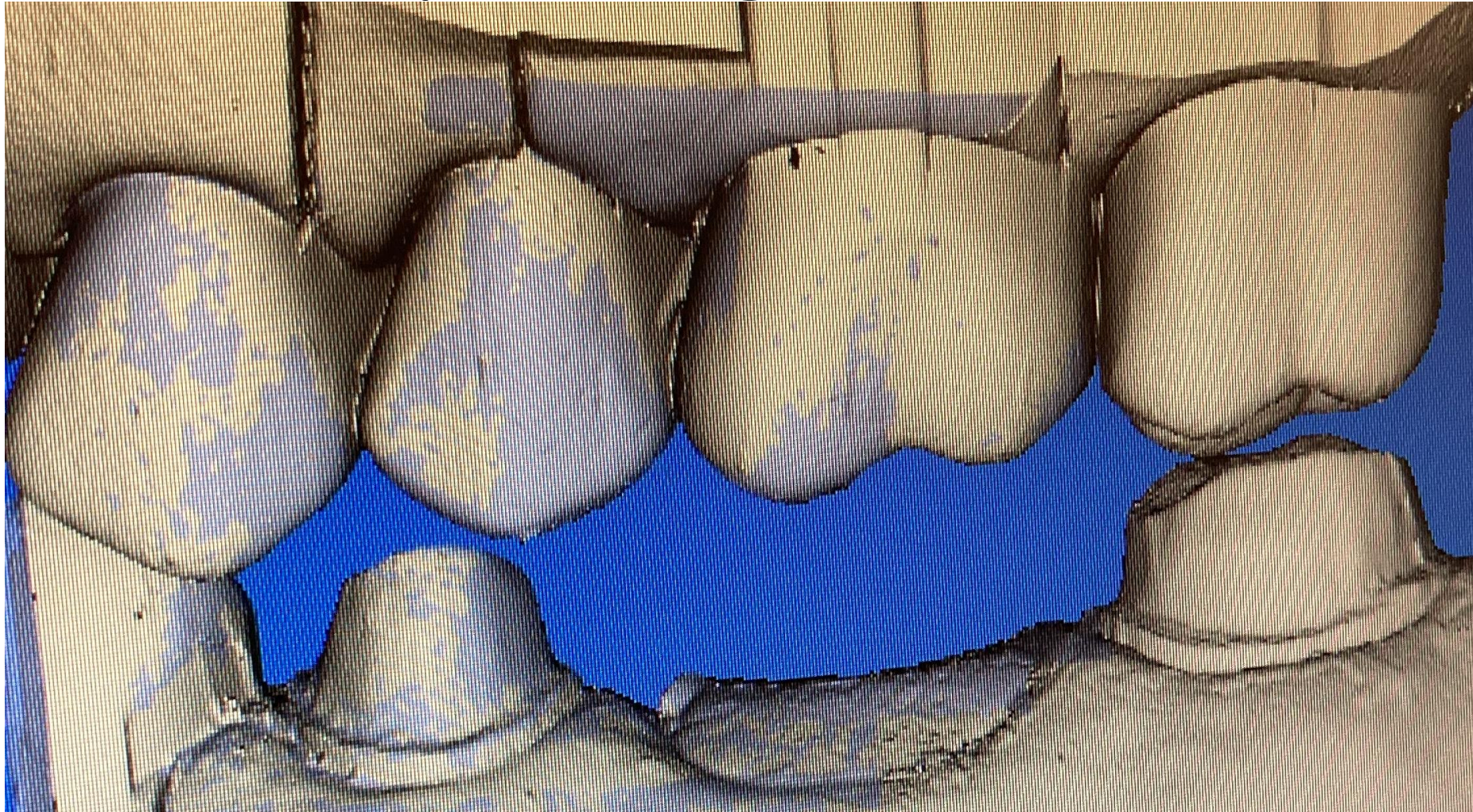
# Scanning the Crown Preparations with an Intraoral Digital Scanner (CAD/CAM):



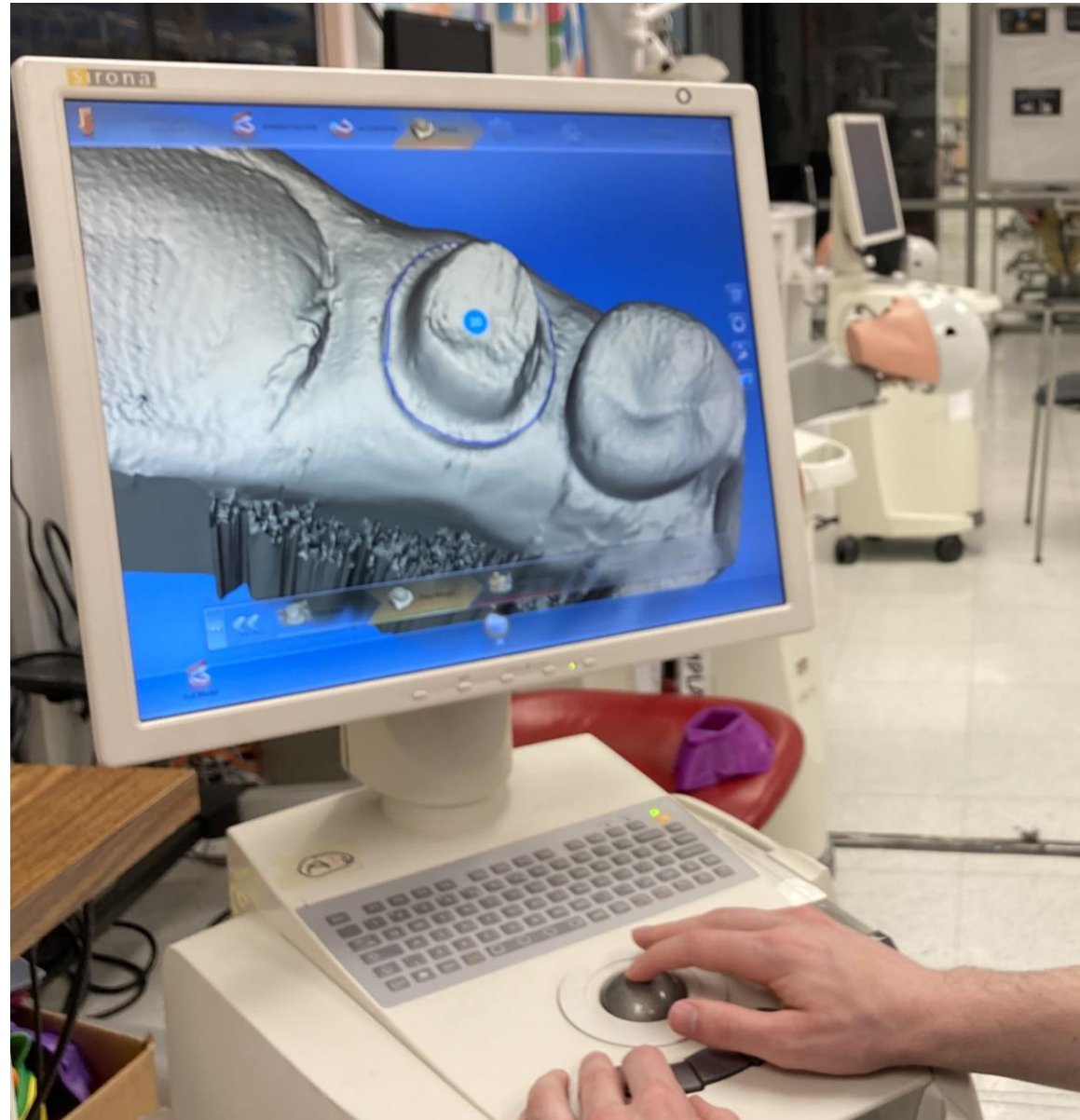
# Manipulating the Digitally Scanned Images:



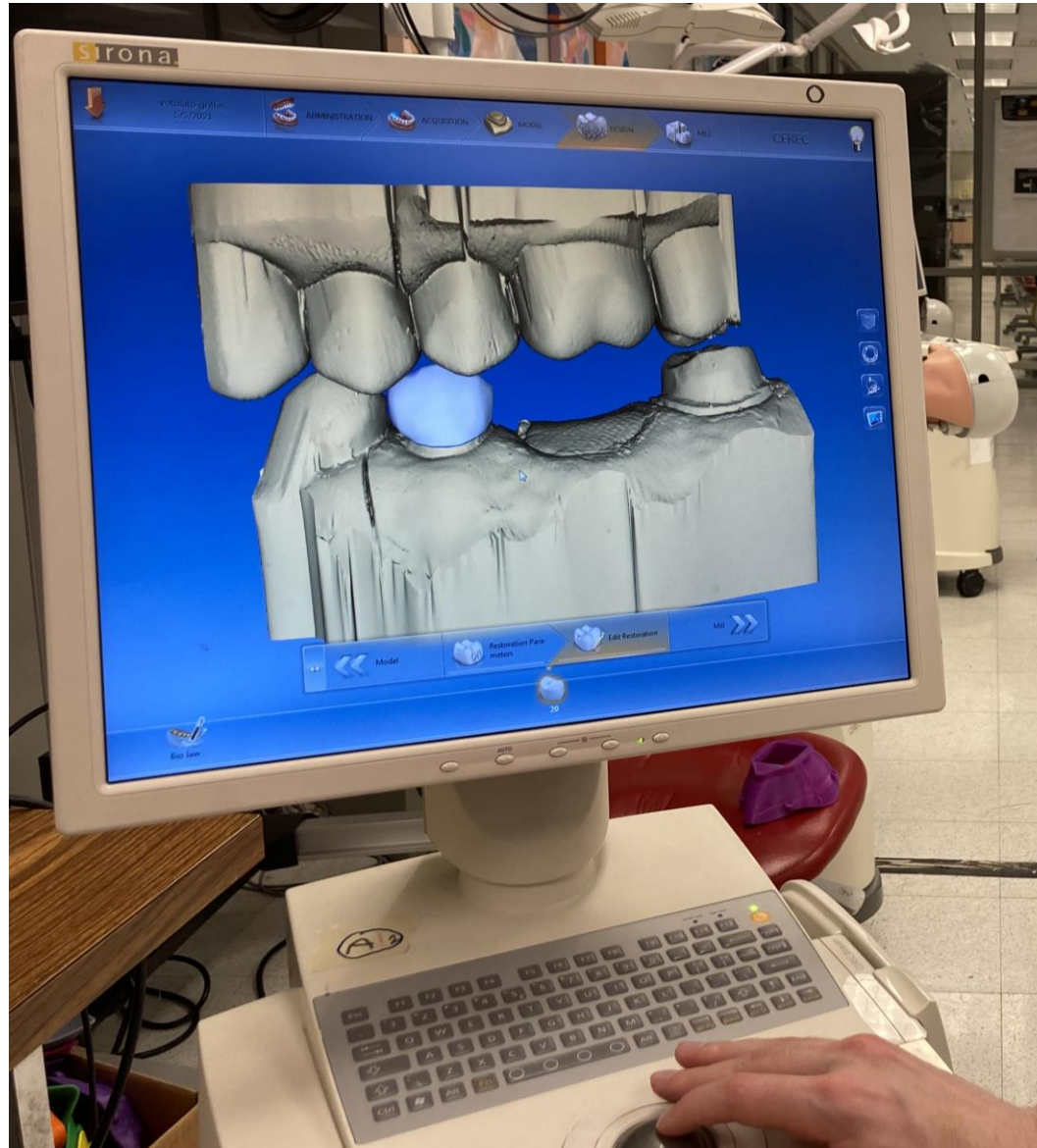
# Computer Aligns the Bite:



# Defining the Crown Margin Digitally:

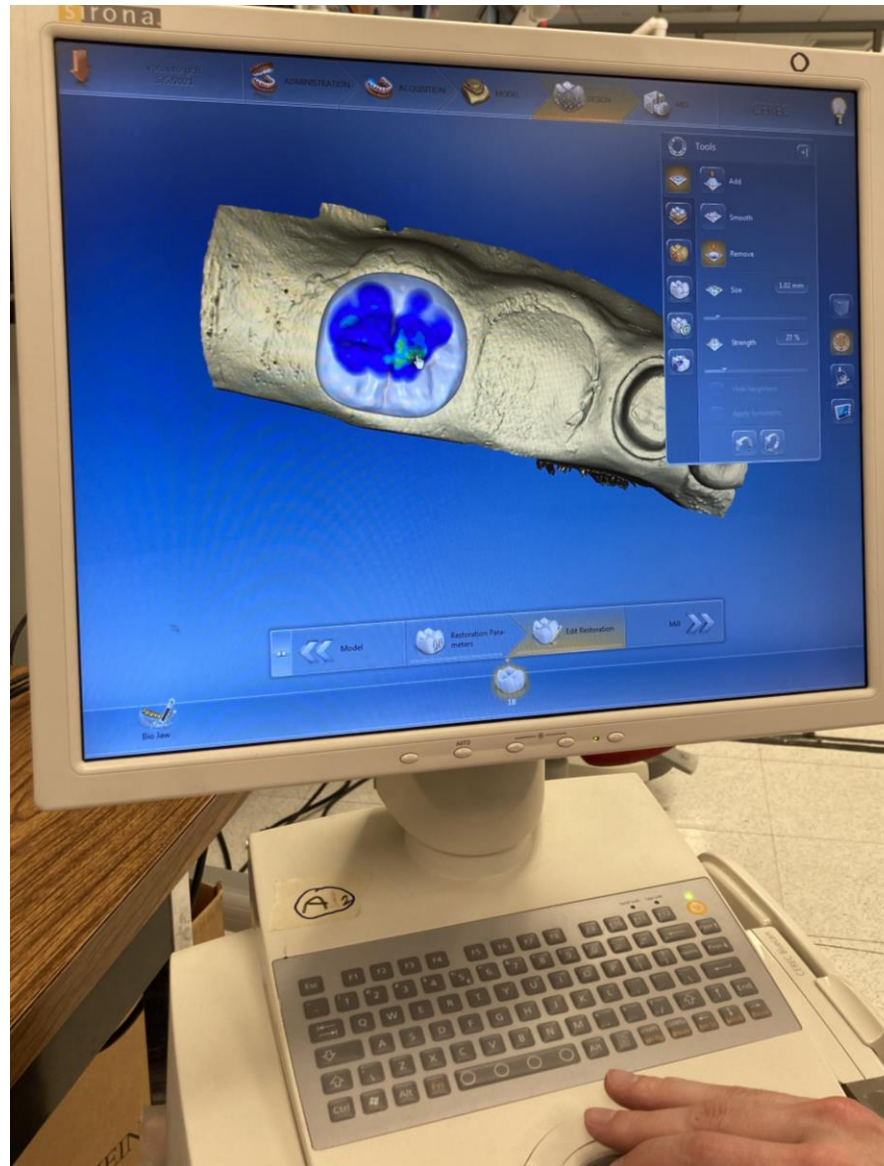


# Digitally Designing the Dental Crown:

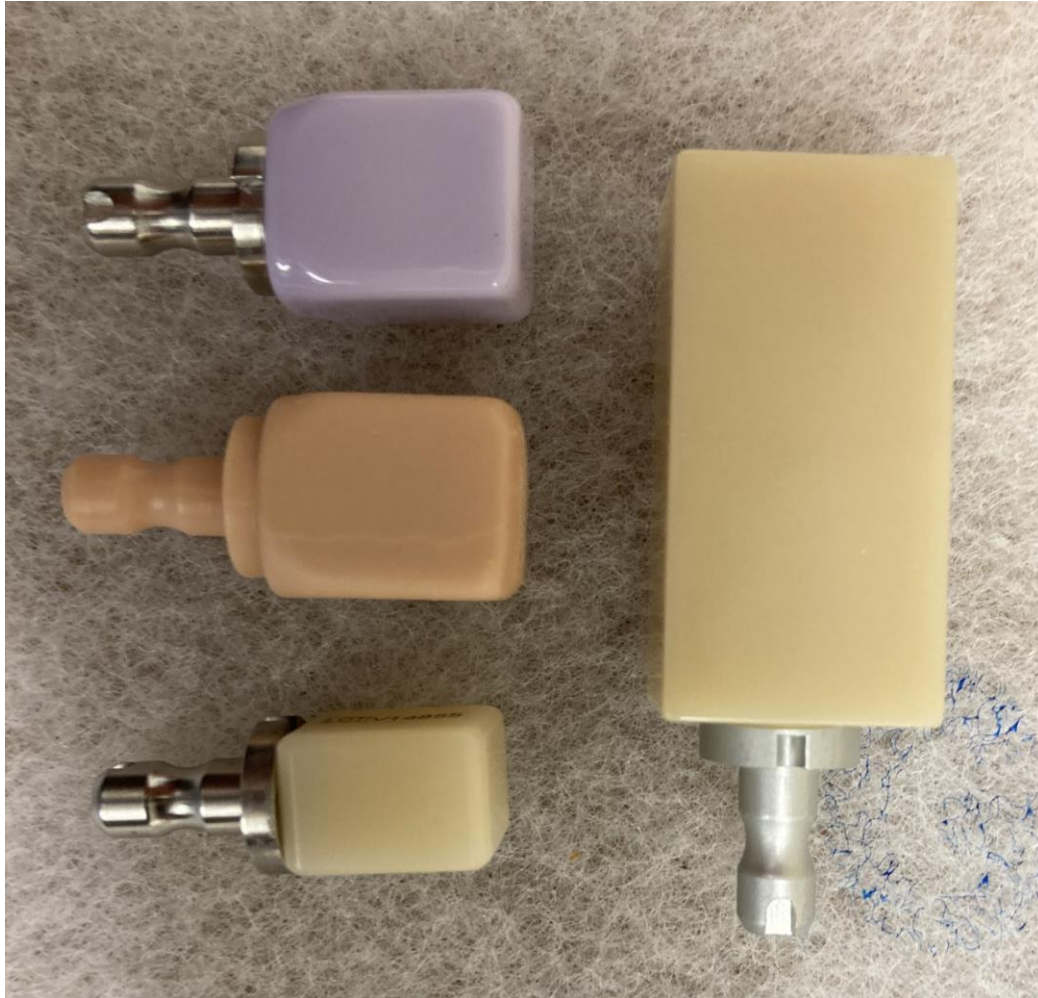




# Evaluation the Occlusion (Bite):

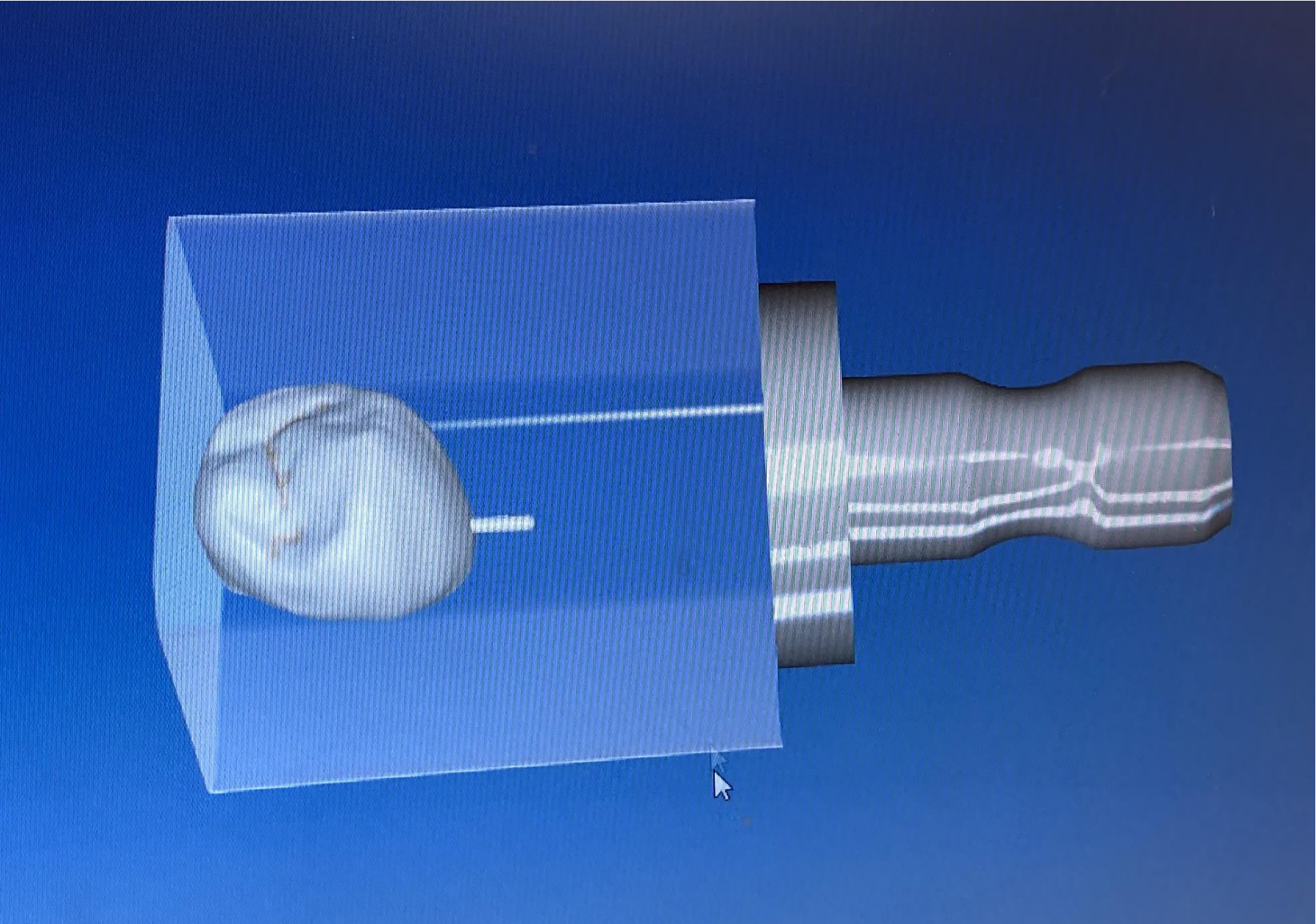


# Material Choices for Computer Aided Manufacturing:

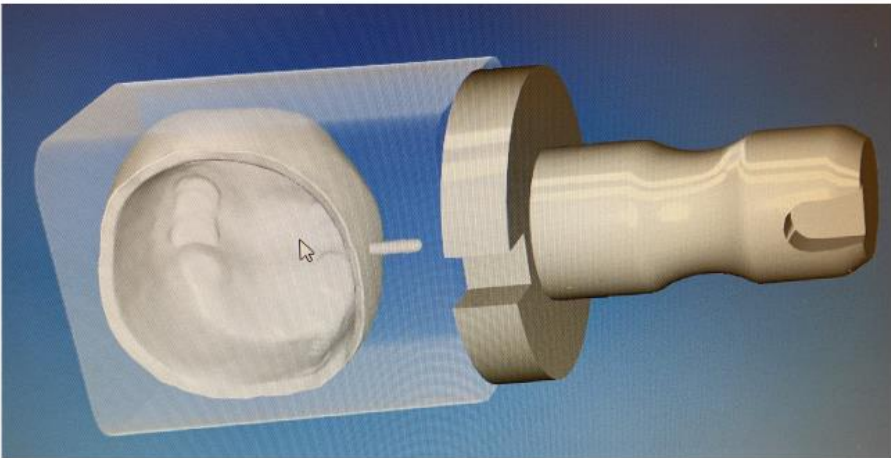
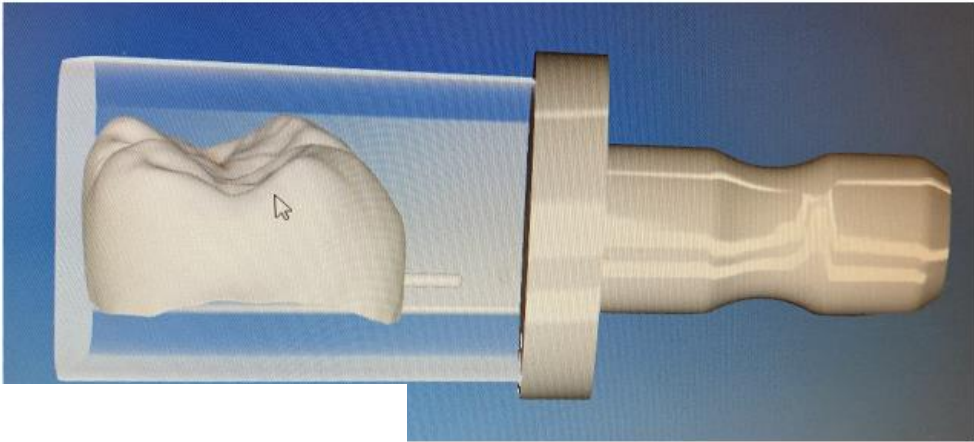
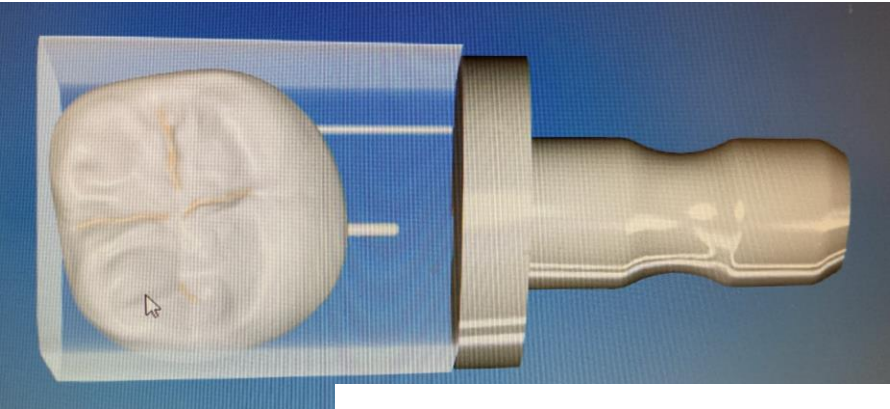


# Make Sure that the Crown is Within the Block:





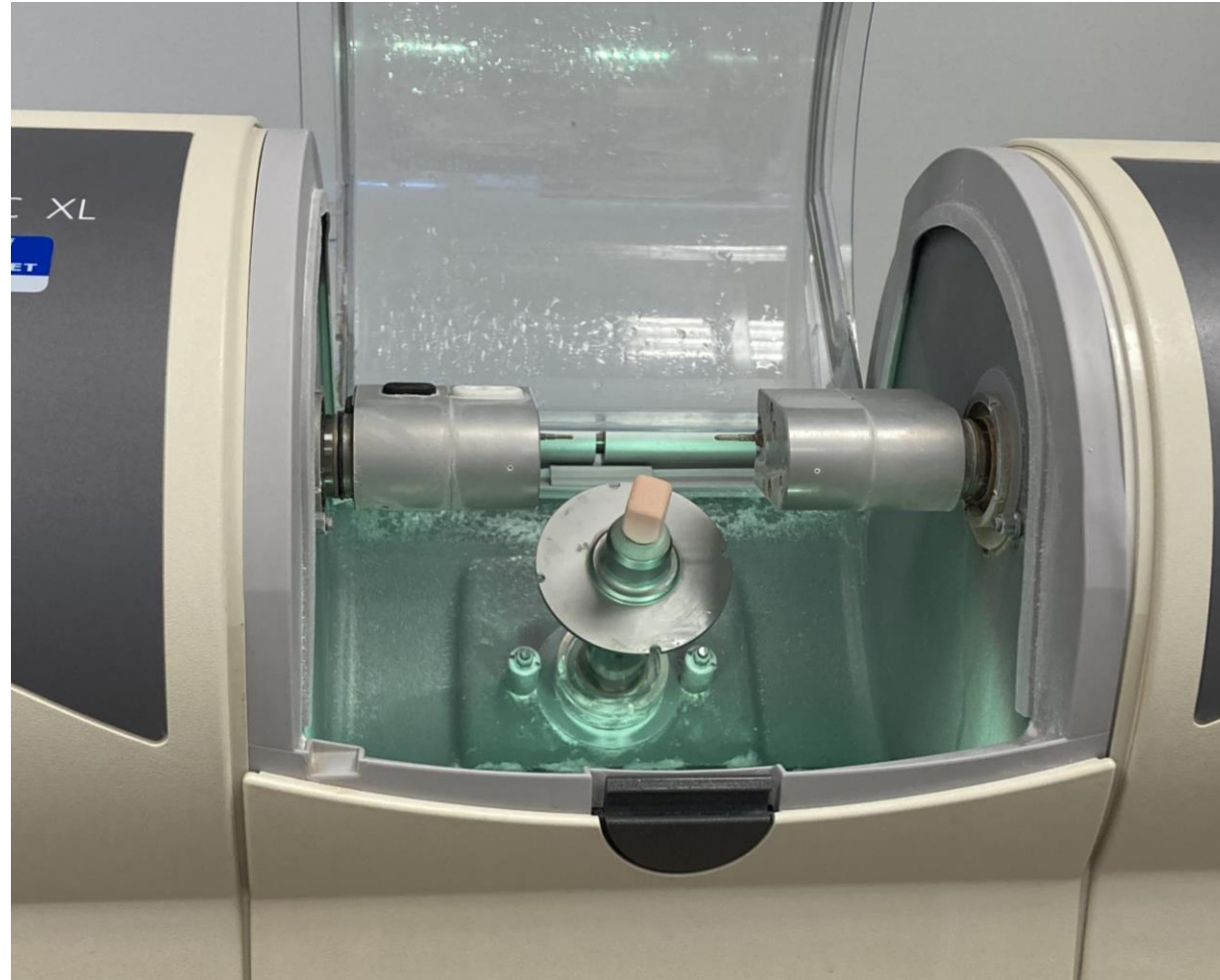
# Ability to view Digital Crown from Different Views:



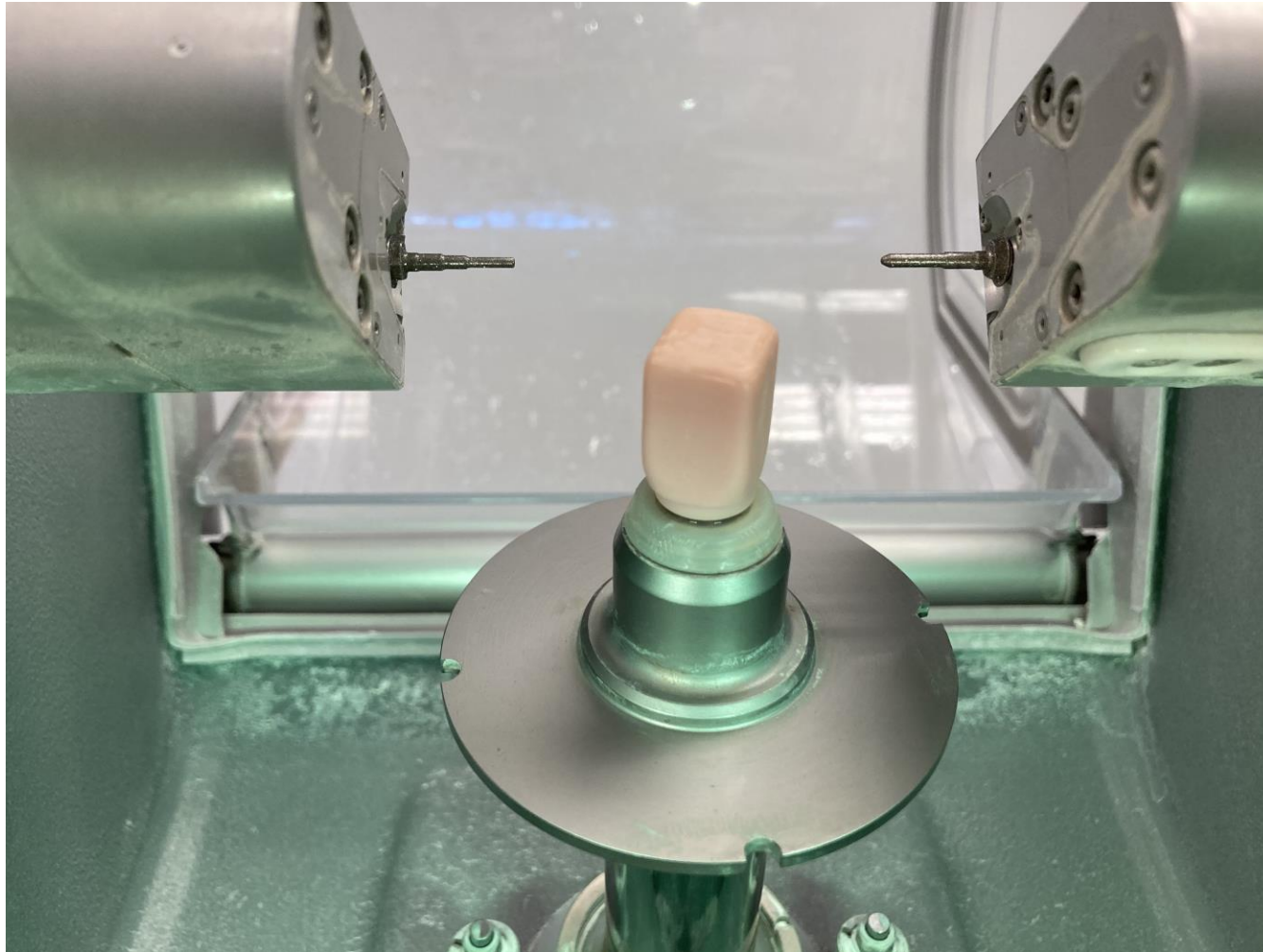
# 3-D Printed Acrylic Block from Digital Scan of Ceramic Block:



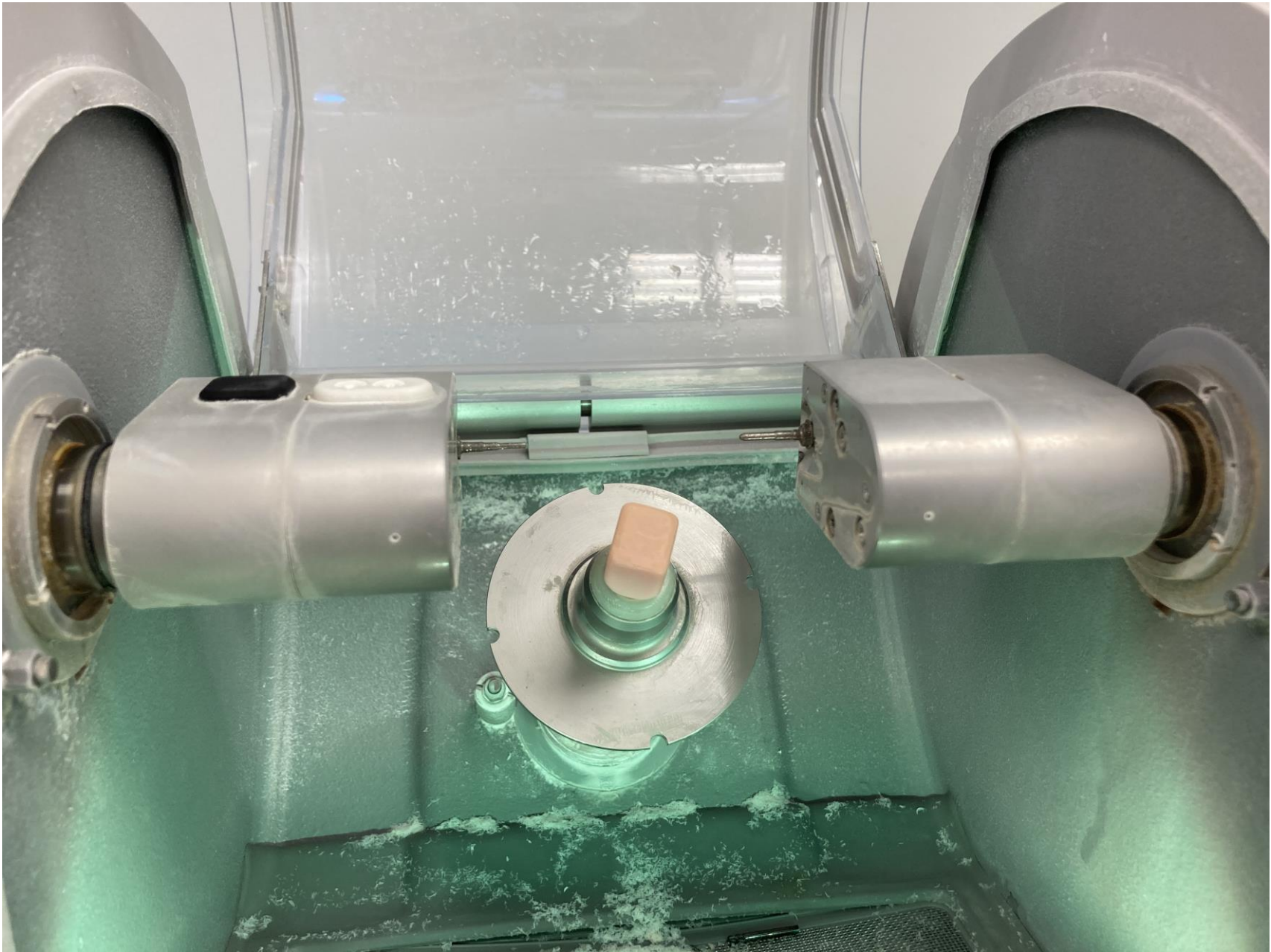
# Block Placed in Milling Machine:



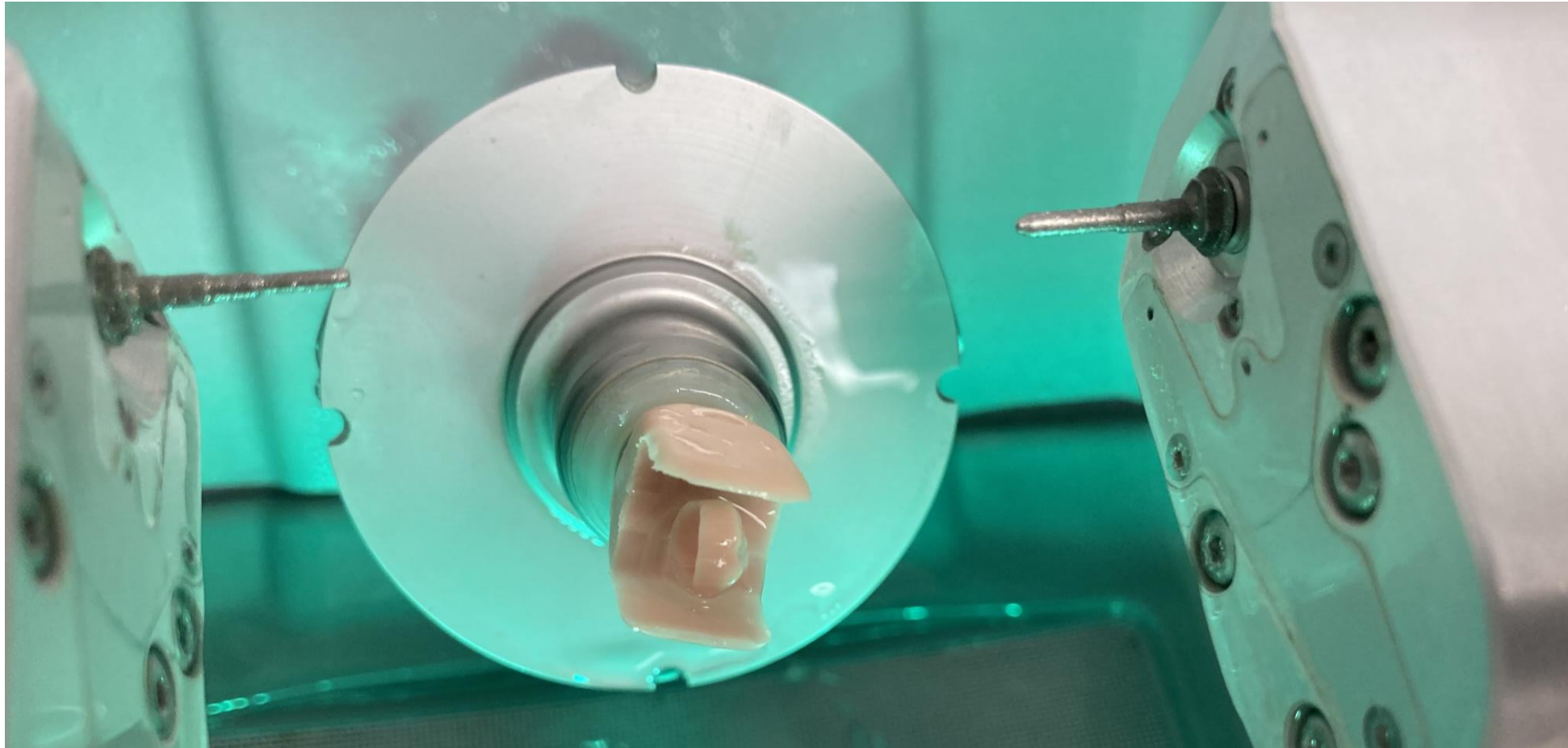
# Diamond Burs Grind the Actual Crown from Digital Information:



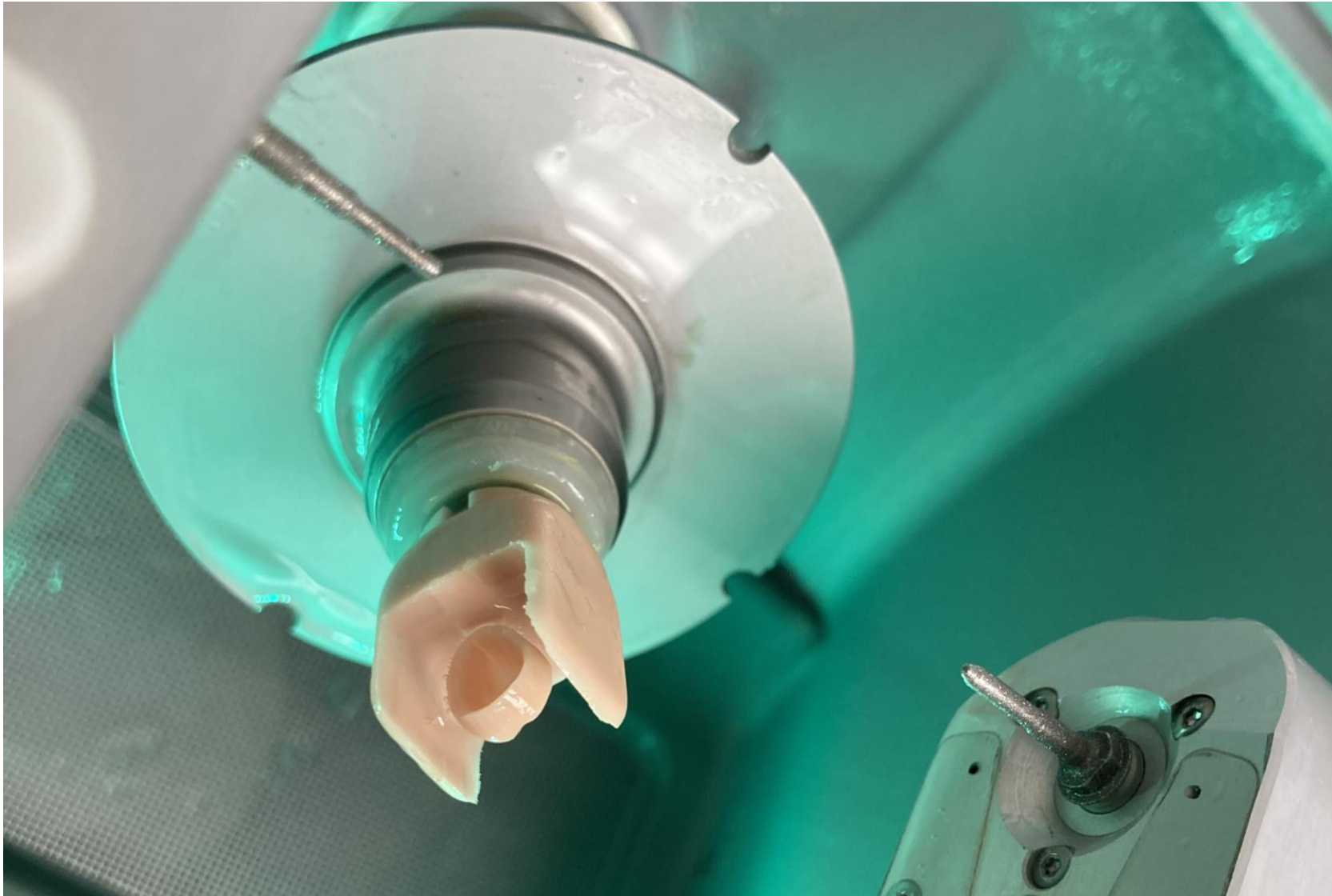




# Computer Aided Manufacturing (CAM):



# Computer-Aided Manufacturing:



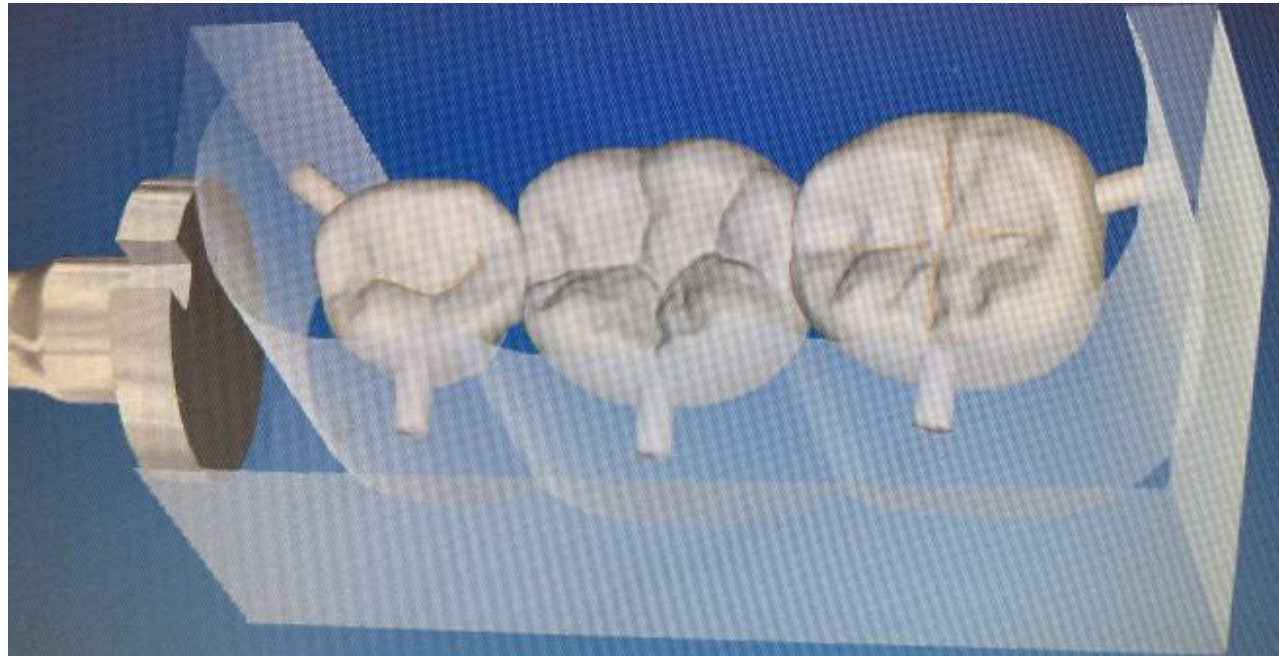
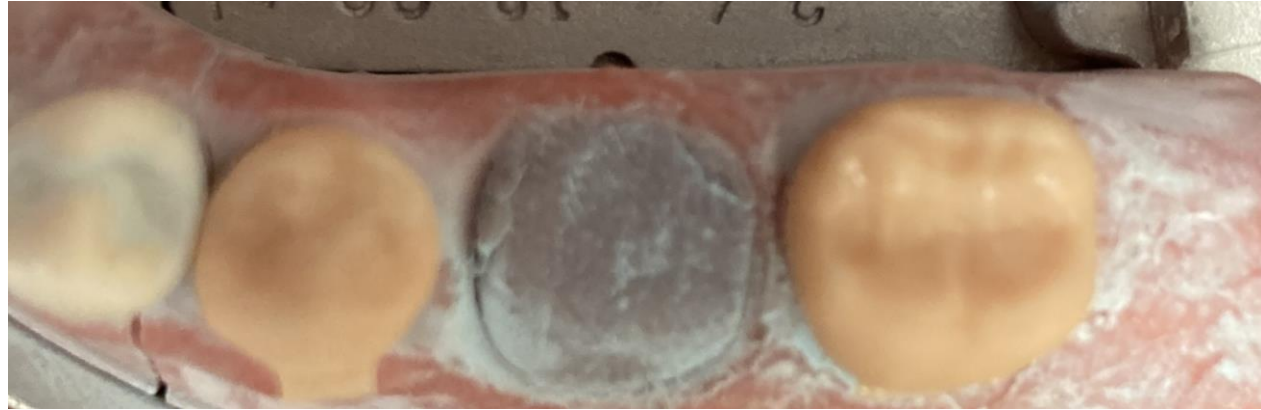
# Before and After Grinding:



# The Value of Incorporation 3-D Printing Technology:



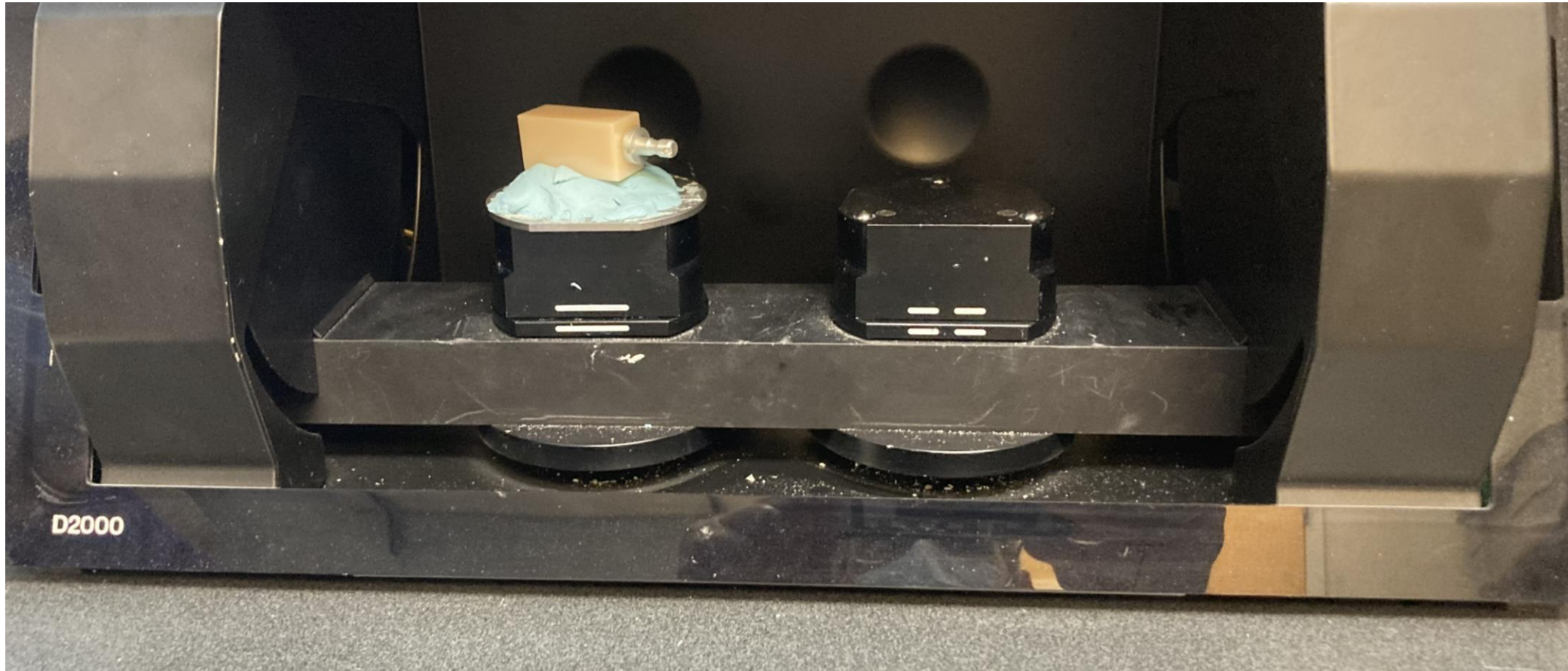
## 2 Single Crowns or a Bridge:



# Innovative 3D Printing:

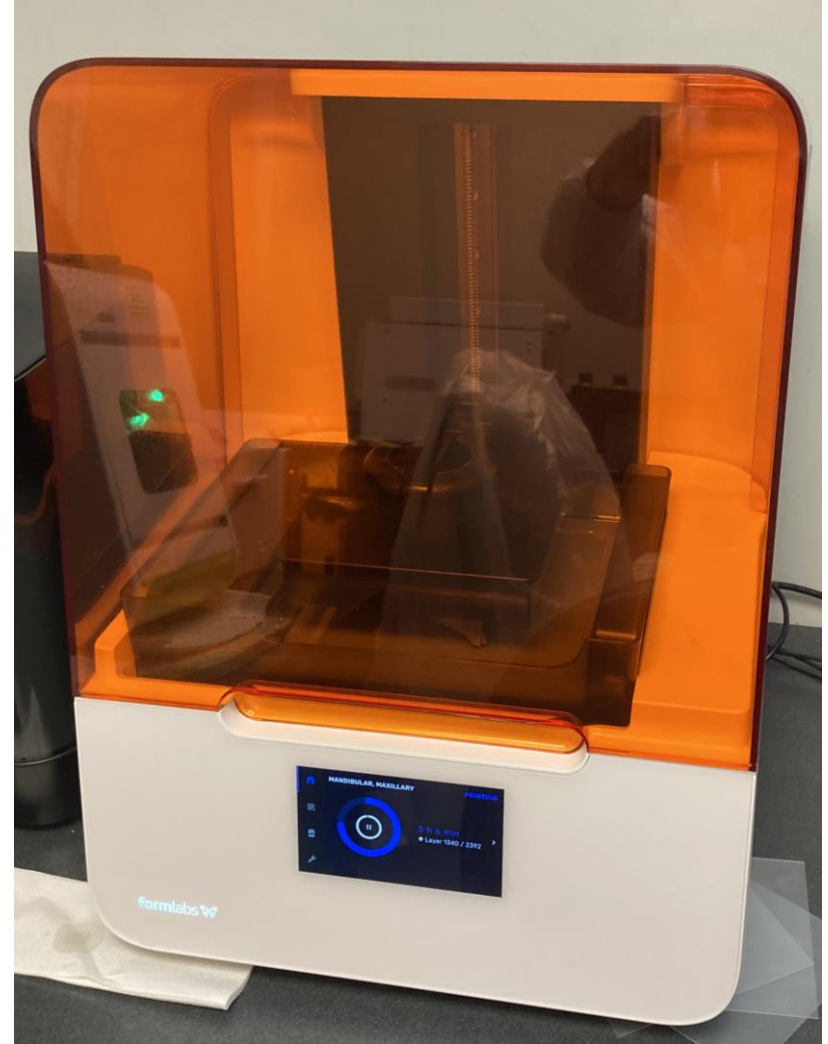


# Bridge Block in 3-D Scanner:





# 3-D Printer:



# Questions???

