

3D PRINTED DENTAL MODELS:

A Cost-Effective Adjunct to Clinical Experience

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The Gap

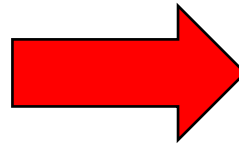


Simulation

The Gap



Simulation

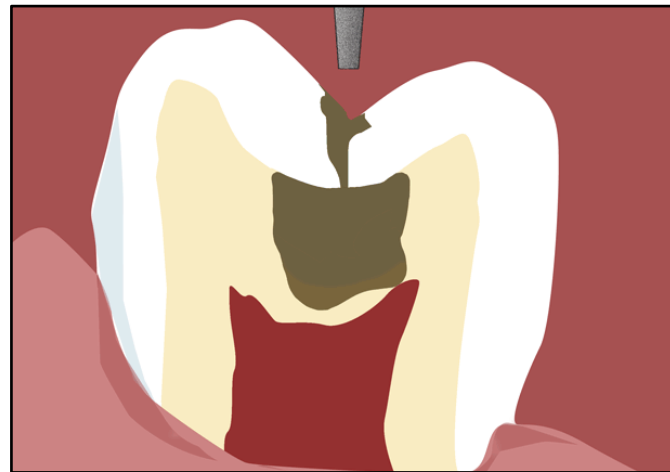
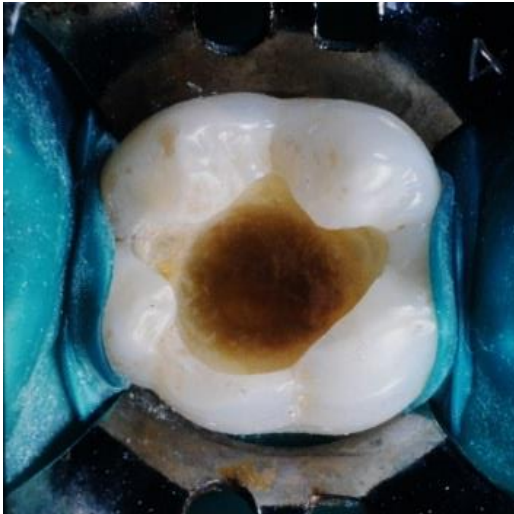
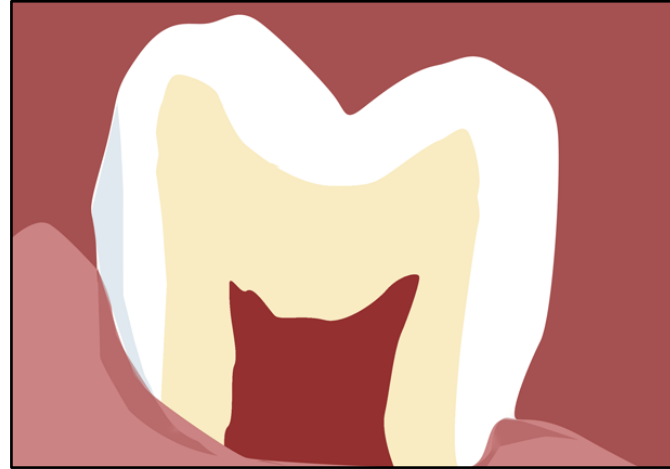
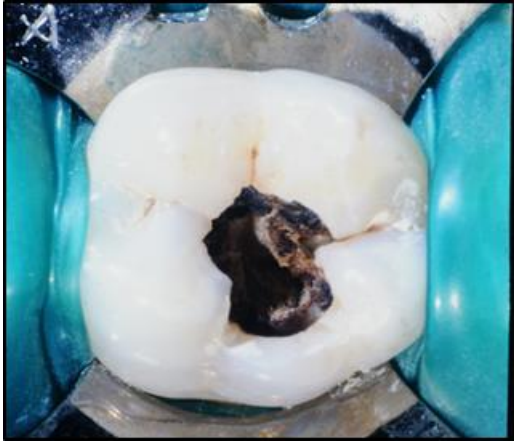


Cold, hard
reality

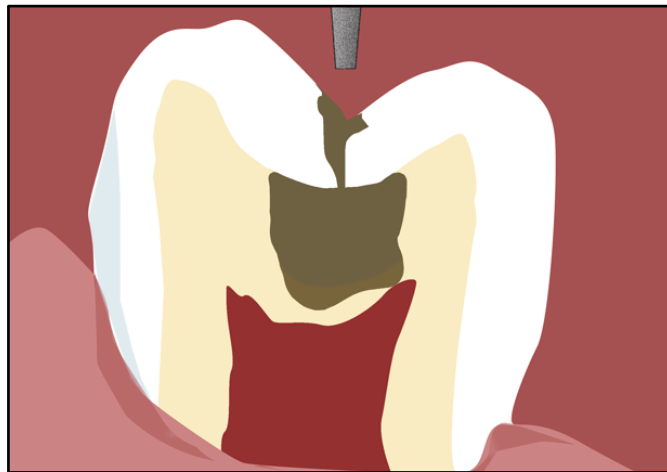
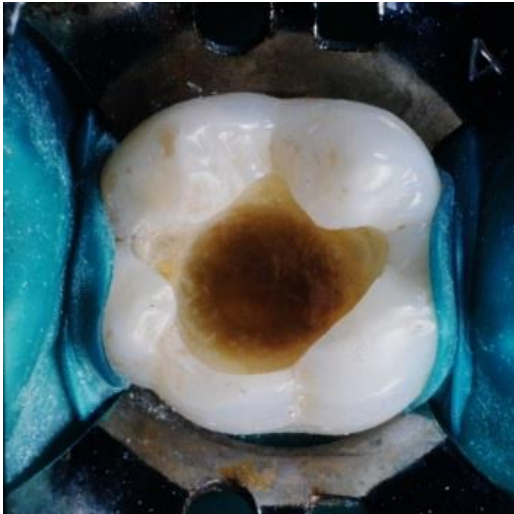
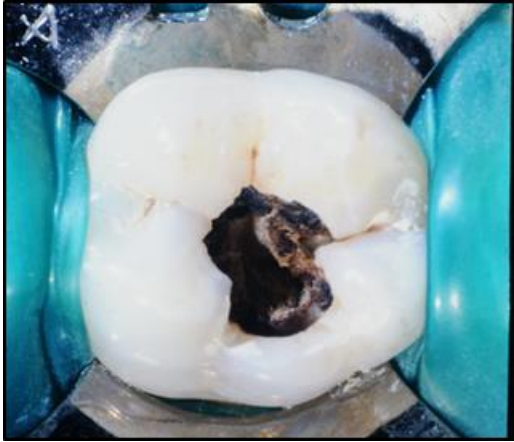
Will present 3 specific use-cases:

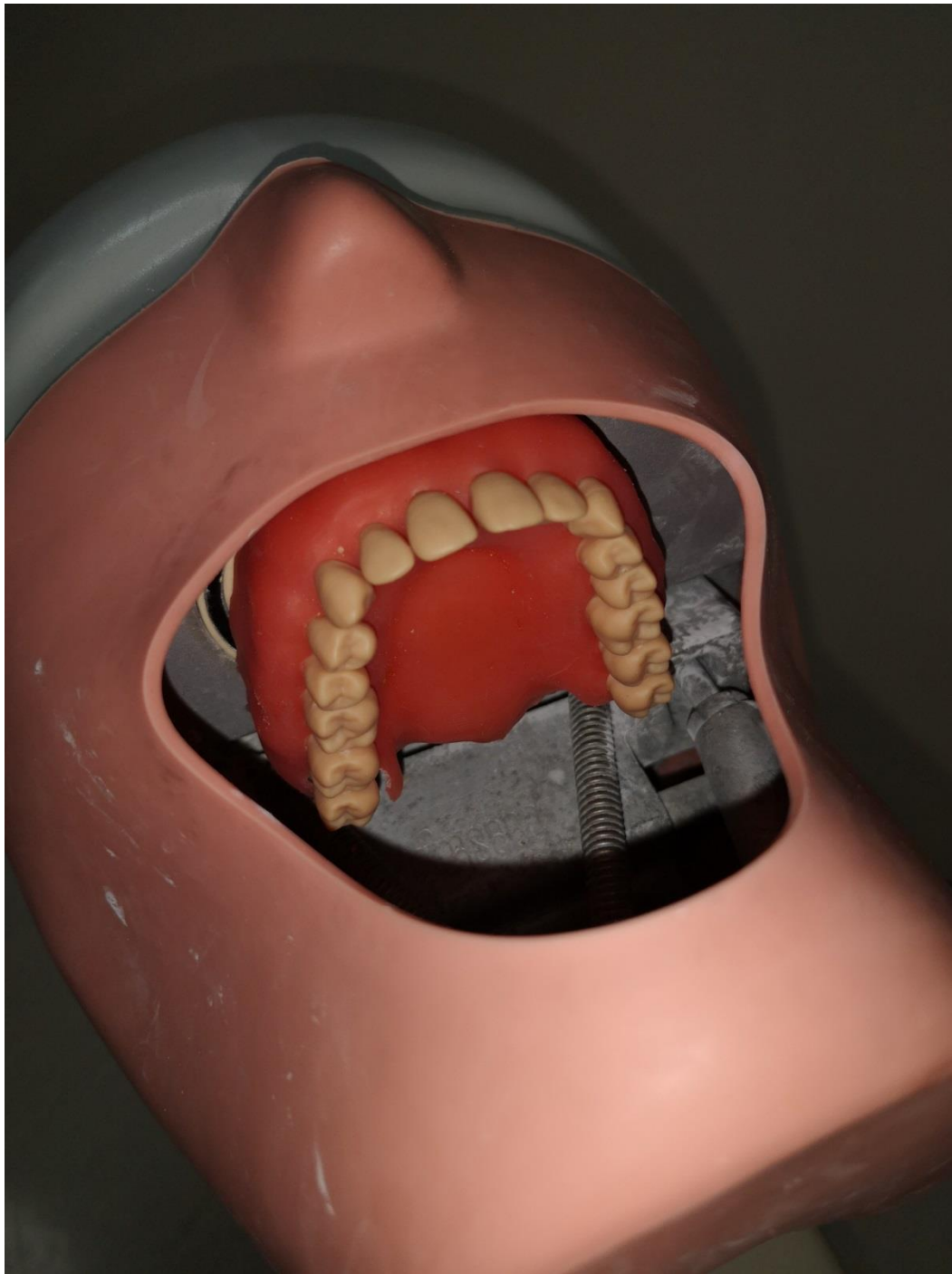
1. 3D printed carious teeth
2. Realistic crown exercises
3. Advanced cases - toothwear

1.3d printed carious teeth

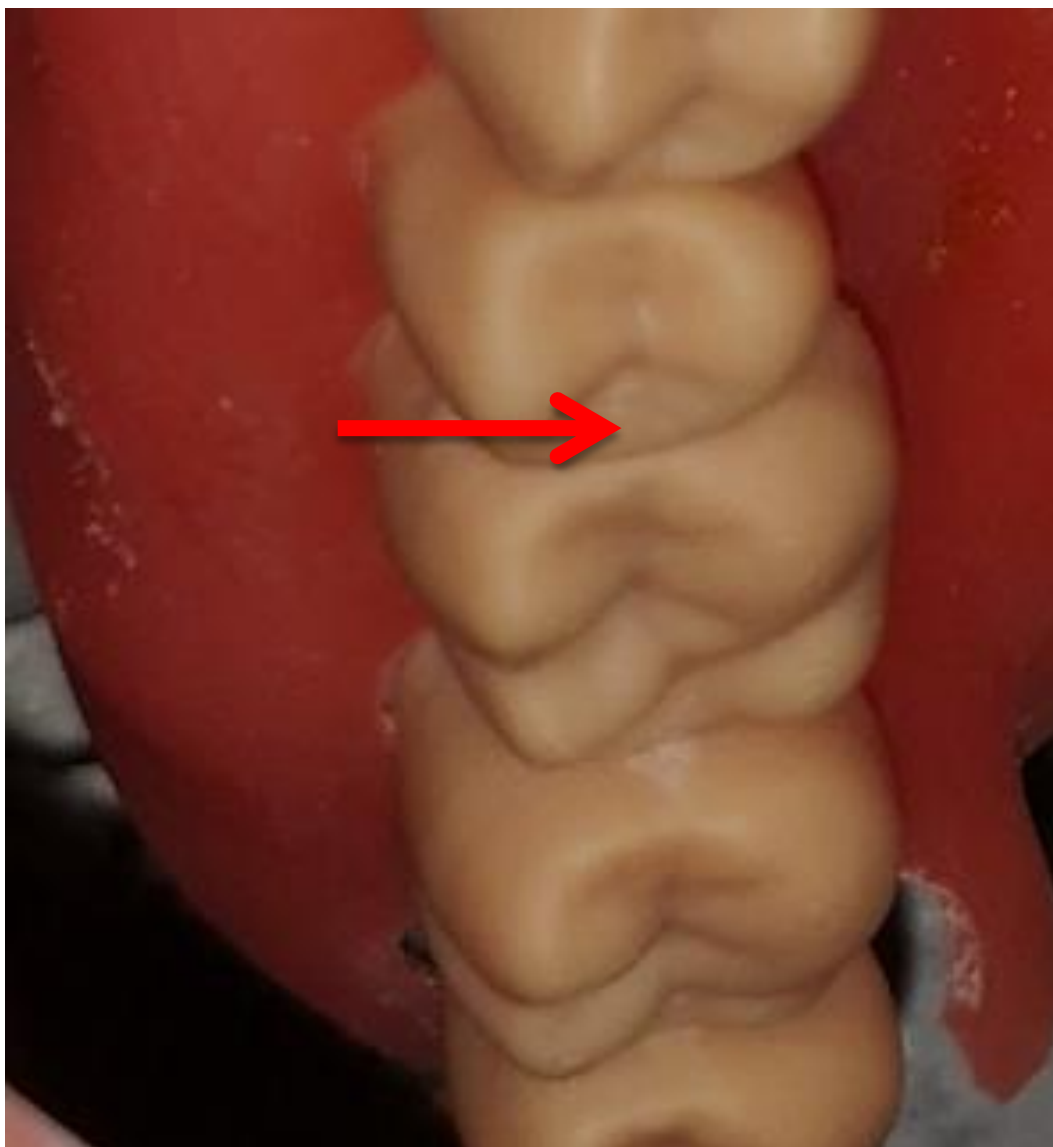


1.3d printed carious teeth

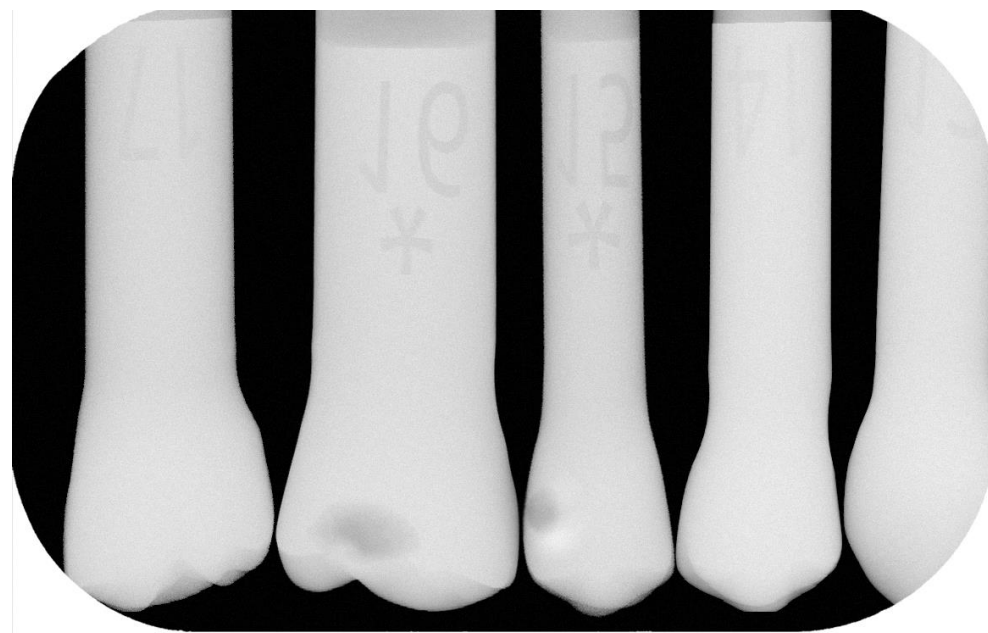




Full arch of
bespoke teeth



Distal caries
UR5 to be
treated



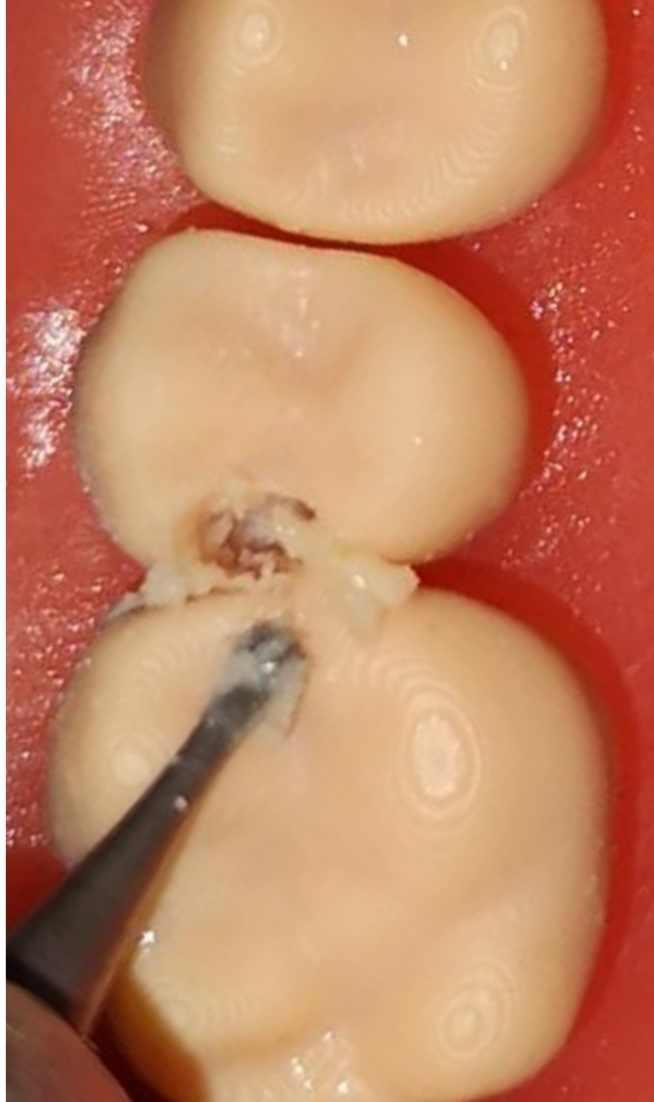


Access with
high speed

Caries visible in
dentine



Caries feels soft
and can be
hand excavated



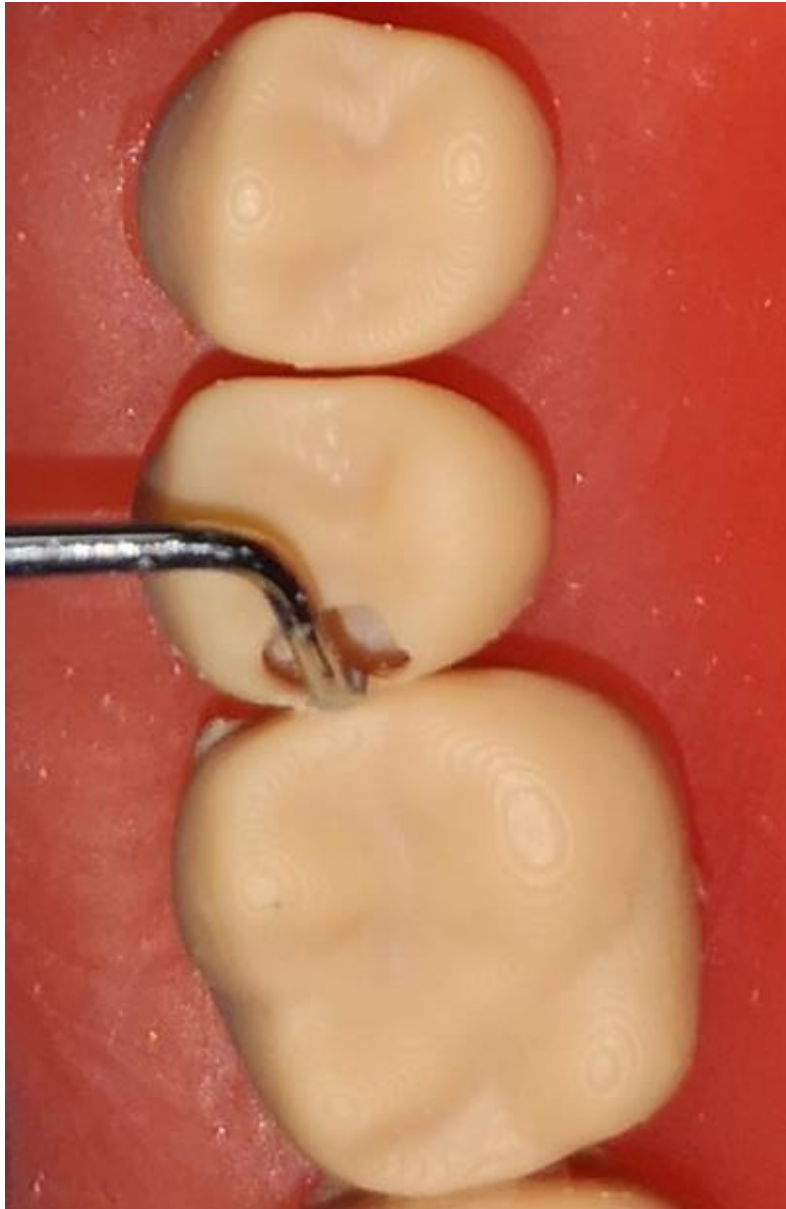
Soft caries can
also be removed
with slow speed



Preserve distal
wall to avoid
damage to UR6

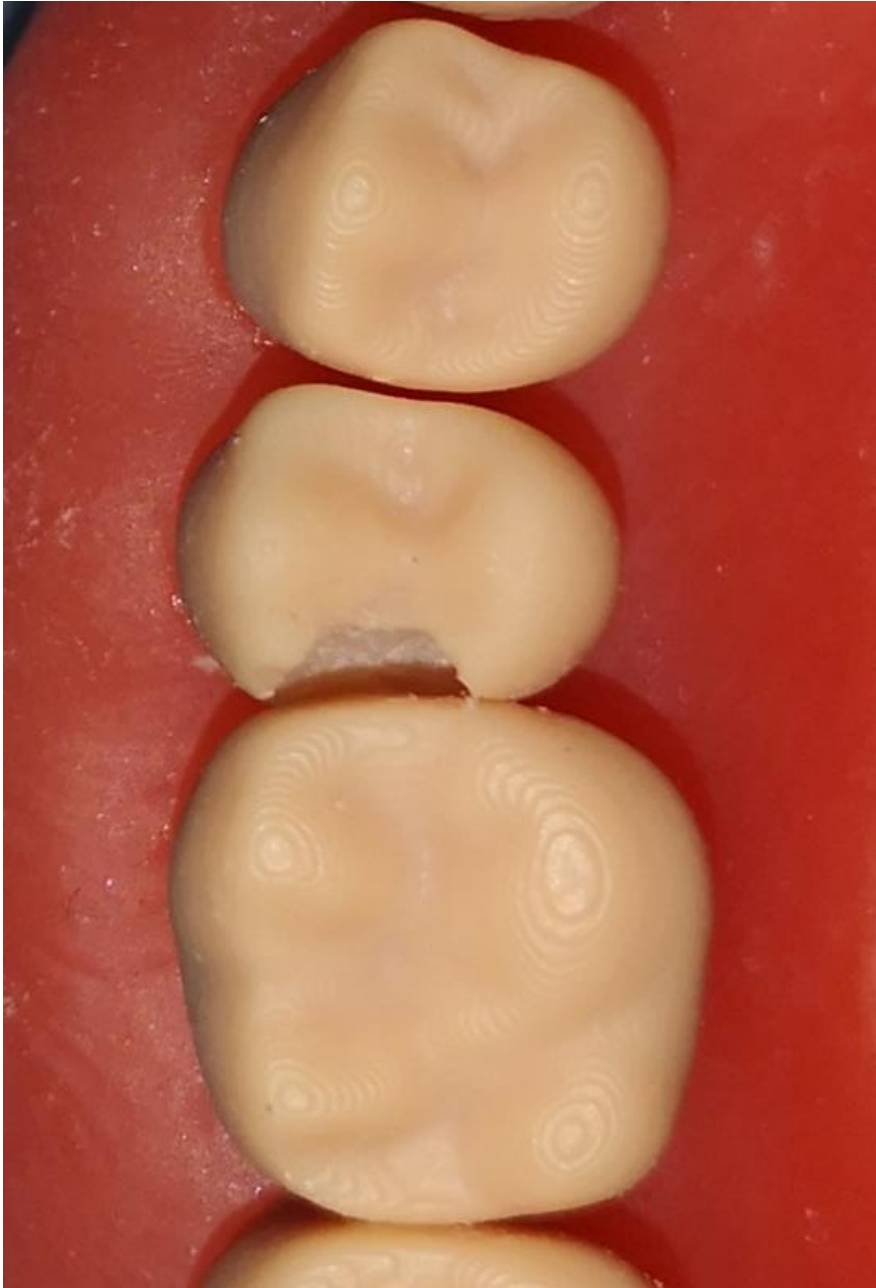


Confirm caries
removal with
probe



Break distal wall
with excavator





Final cavity

3D Printed Caries Removal

- Pathology-led training, rather than template cutting
- Correct use of all instruments required
- Highly cost effective (less than a standard Frasco tooth)

2. Realistic Crowns



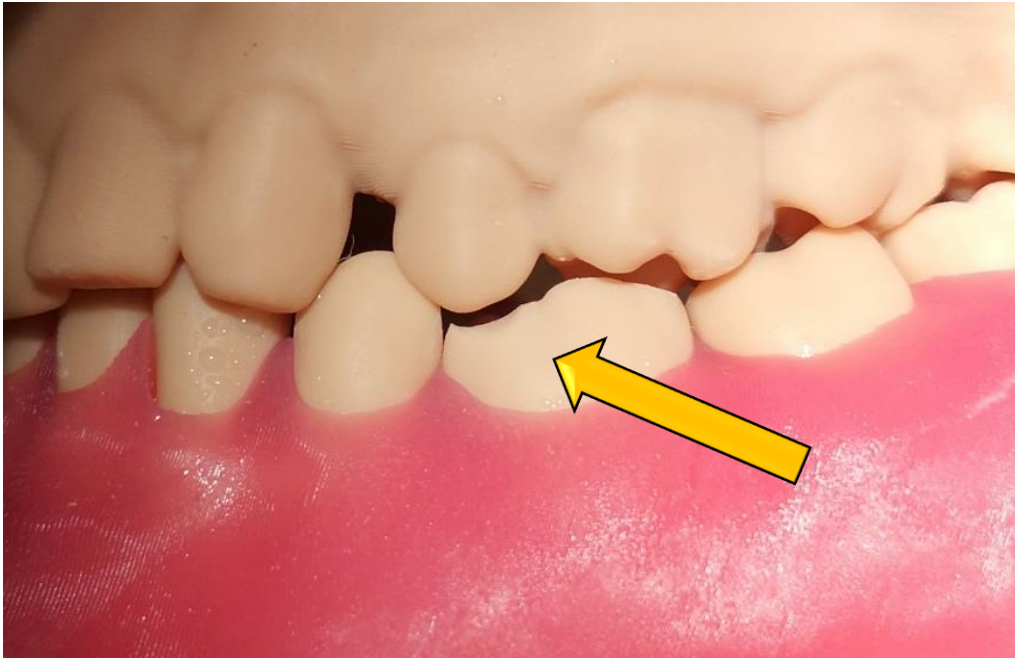
2. Realistic Crowns



2. Realistic Crowns



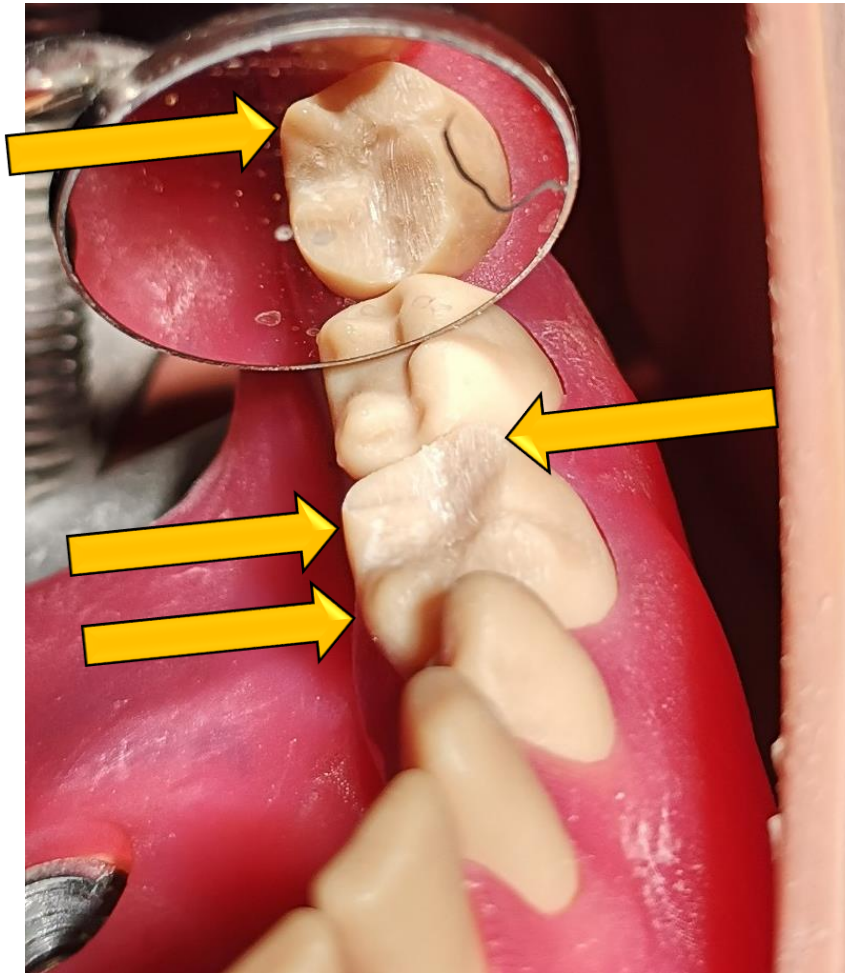
Appropriate occlusal reduction



Mesio-buccal cusp
reduction
Aiming for 1.5mm
occlusal clearance

Appropriate occlusal reduction

Some lingual
regions left
untouched



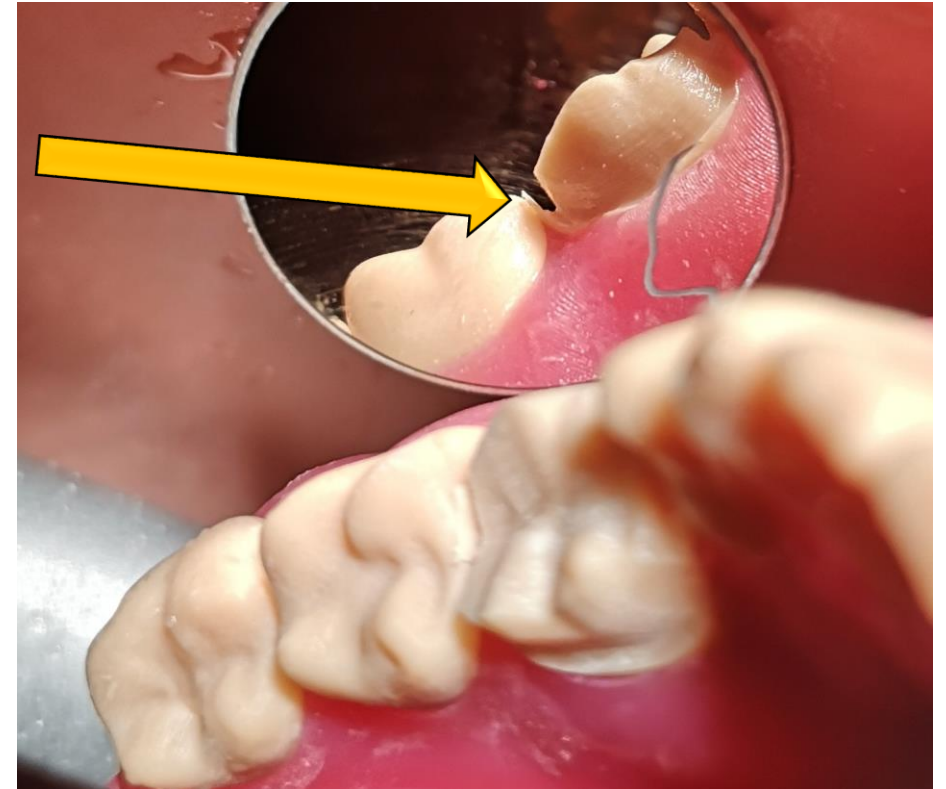
Distal cusps reduced
where needed

Breaking contacts

Fine needle diamond bur

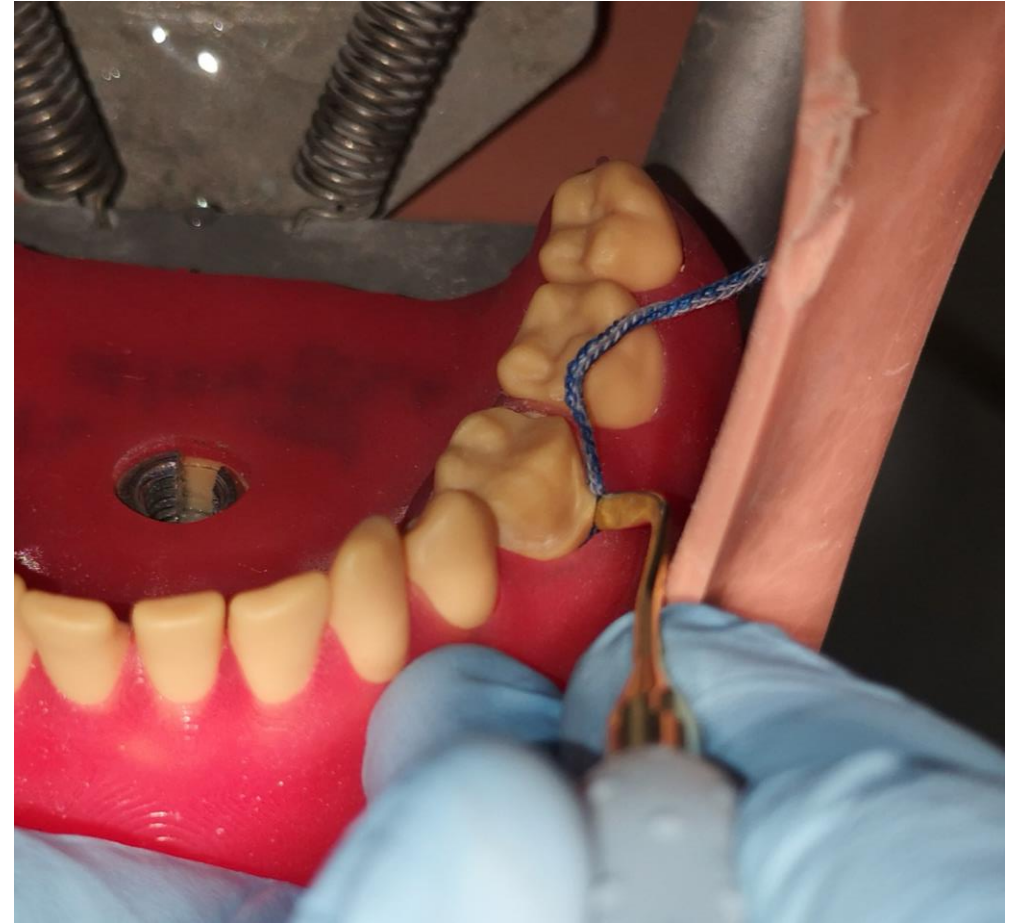


Preserve a thin wall of enamel, then break with hand instrument



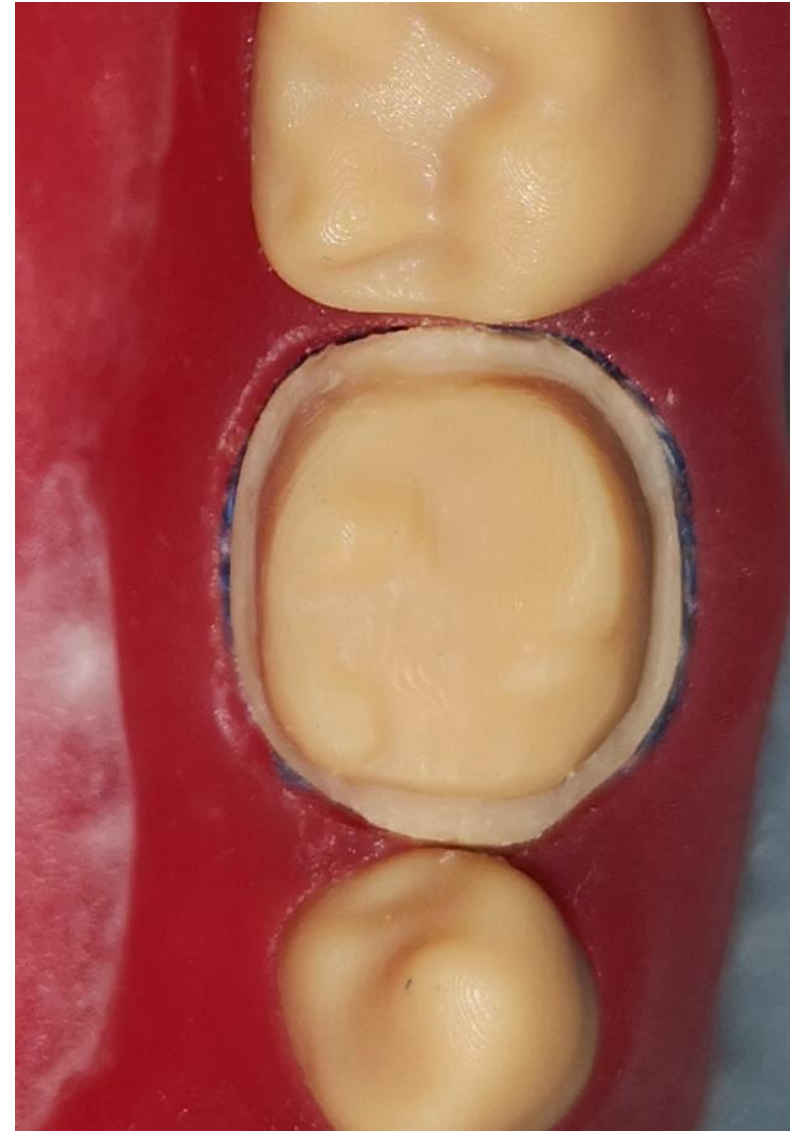
Retraction Cord (if required)

- Moisten with water and apply

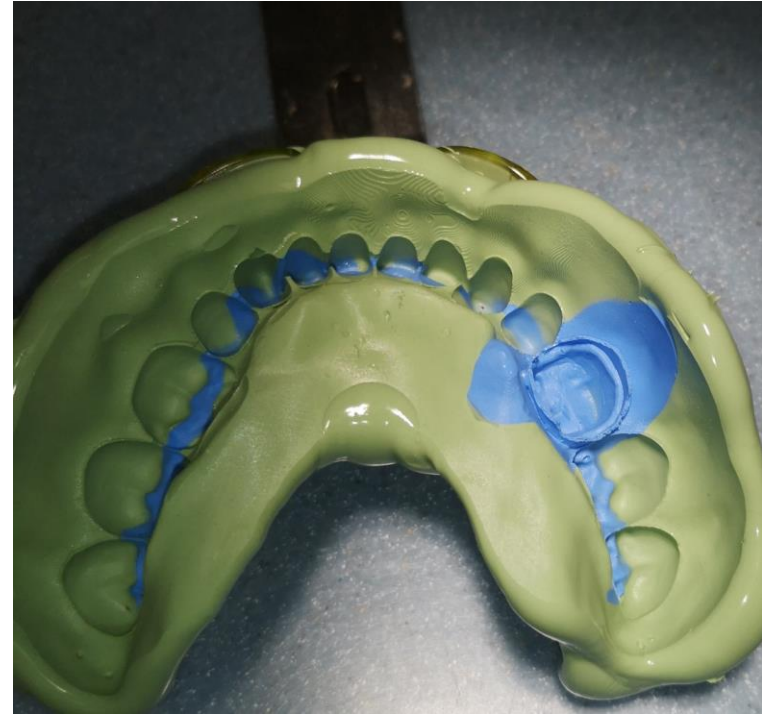
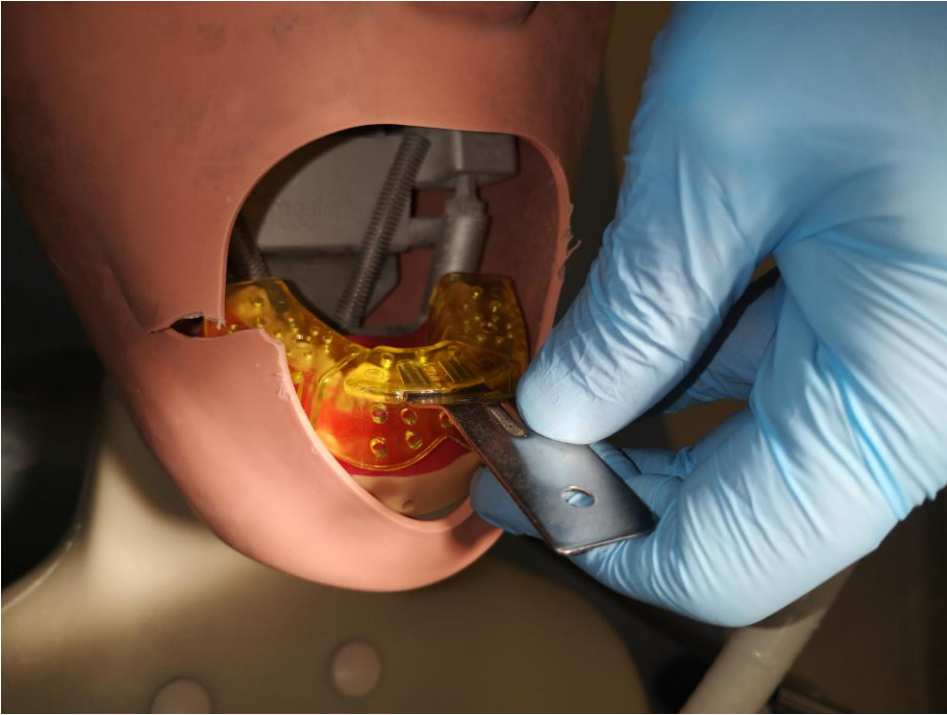


Retraction Cord (if required)

- If cord was used, we suggest a cord-in impression technique for this model



Tray Selection and Silicone Impression



Temporary using 'wax-up'

Original



Wax Up (ML cusp)



Fit Appointment Simulation



Fit Appointment Simulation

Must identify reason for not seating and correct it



Fit Appointment Simulation

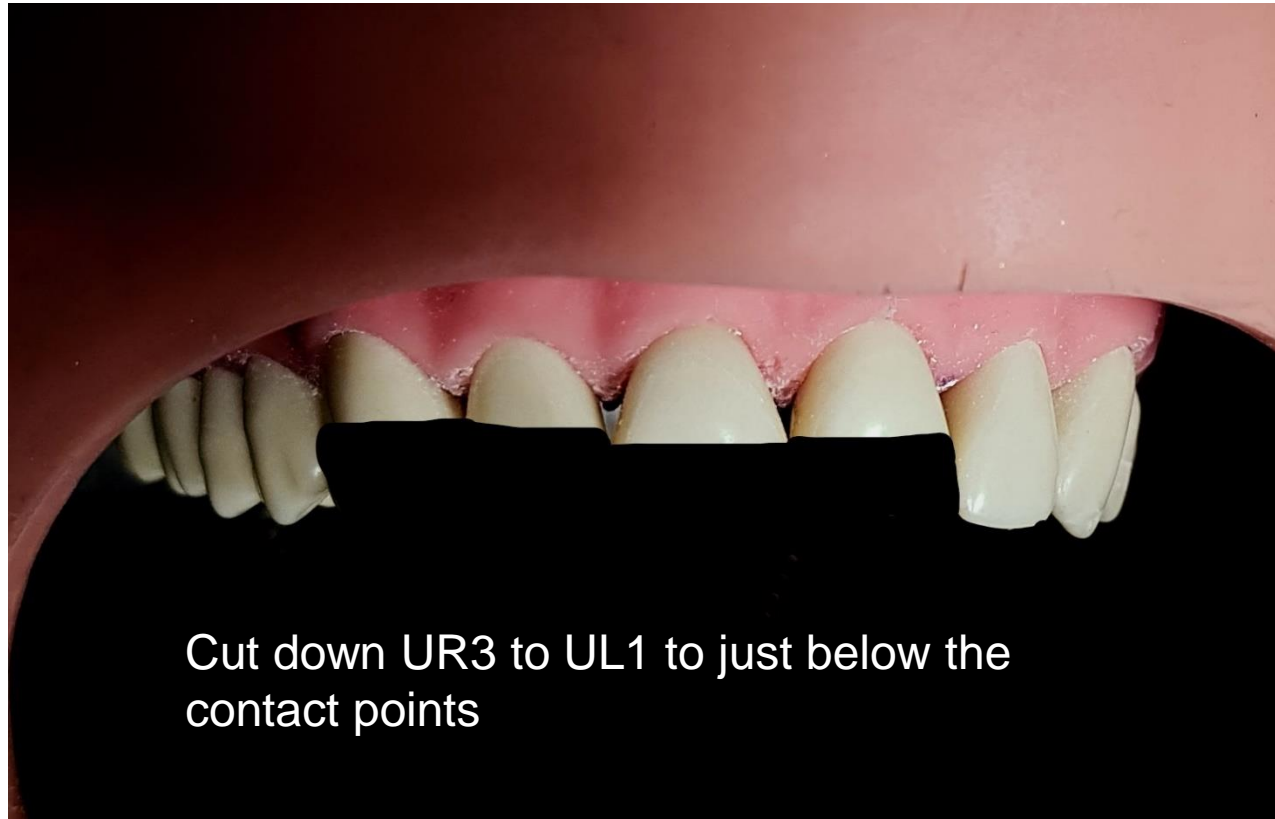
Must identify reason for not seating and correct it



Realistic Crown Exercises

- Patient-specific preparation
- Full procedure including adjusting the final crown to fit

3. Wear Case Composite Build-Ups



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Advanced Wear Case

- Realistic pattern of tooth surface loss
- Gain experience using silicone stent for composite build-ups

Summary

3d printing offers cost-effective ways to enhance clinical simulation and move closer to real clinical situations.

Used as an adjunct to clinical experience, not a replacement.