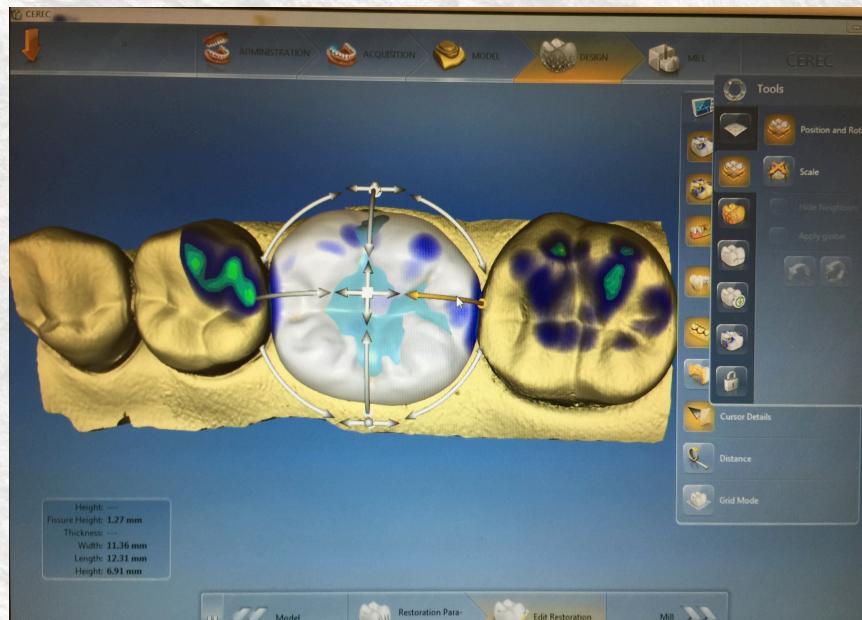


# CADCAM: CEREC Restoration Design

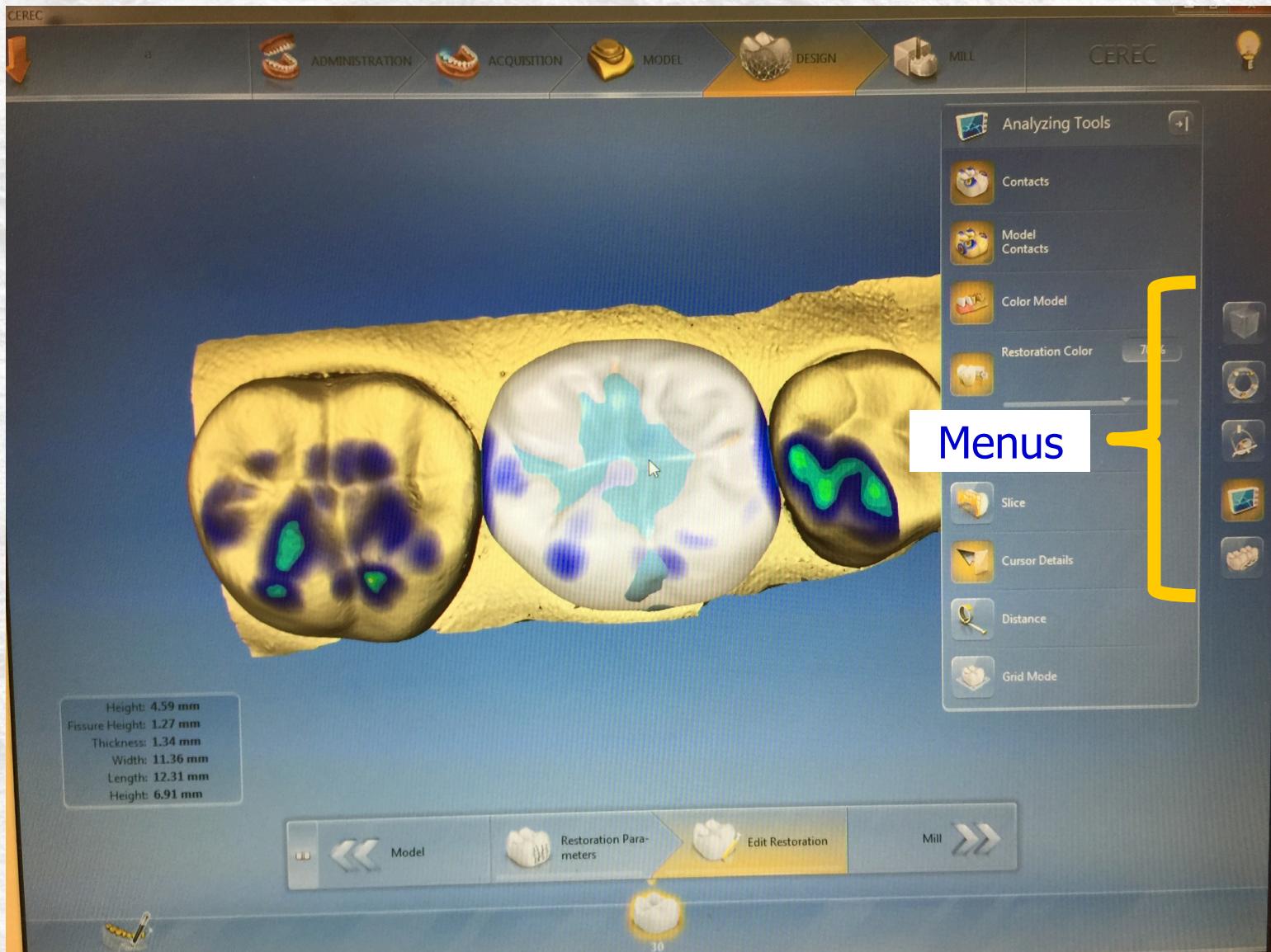


# Design Phase

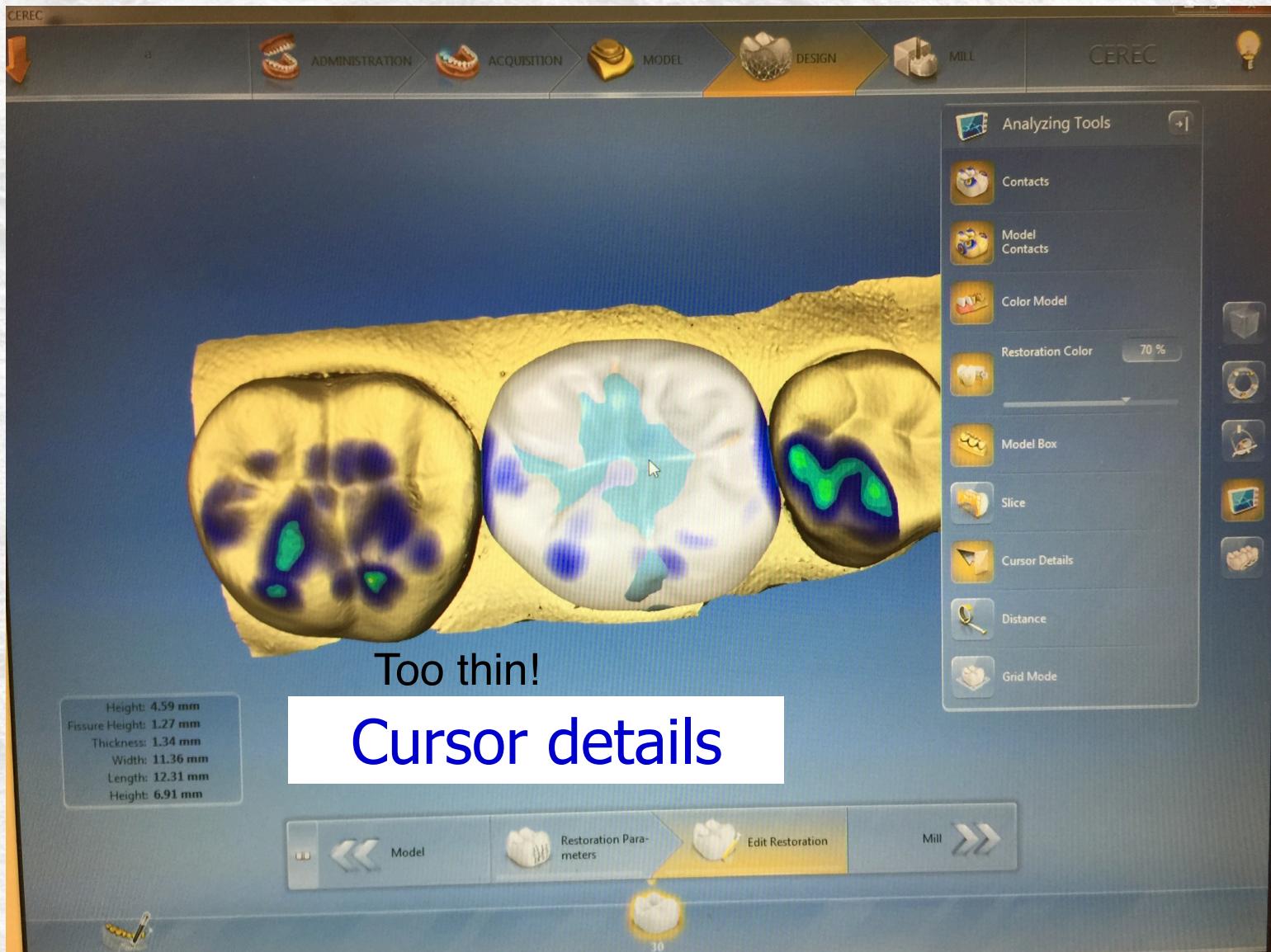
- Use edit tools to modify the design proposal
- Focus on contours, proximal contacts and occlusion
- Don't over-edit!
- Understand the milling process



# Design Phase



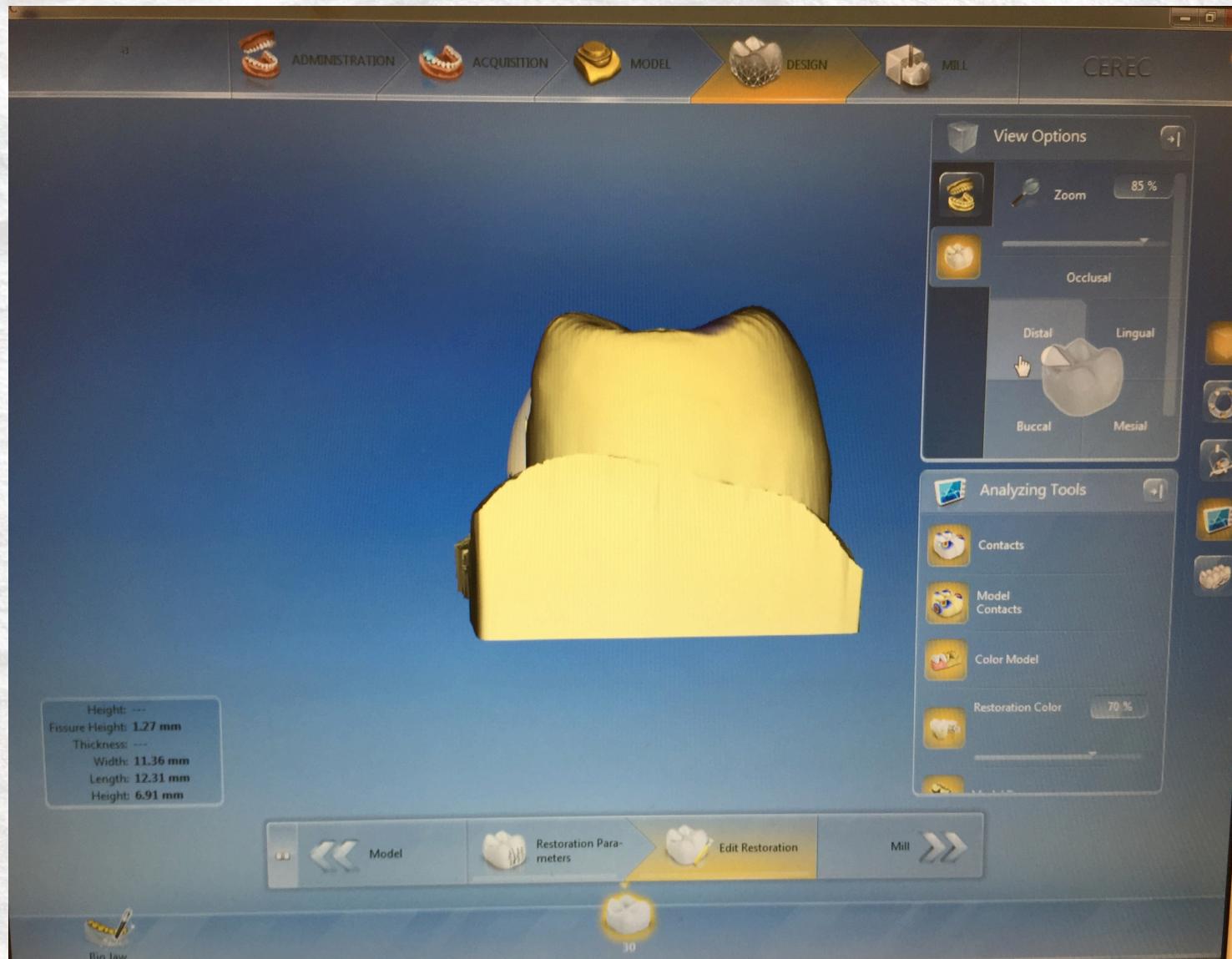
# Design Phase



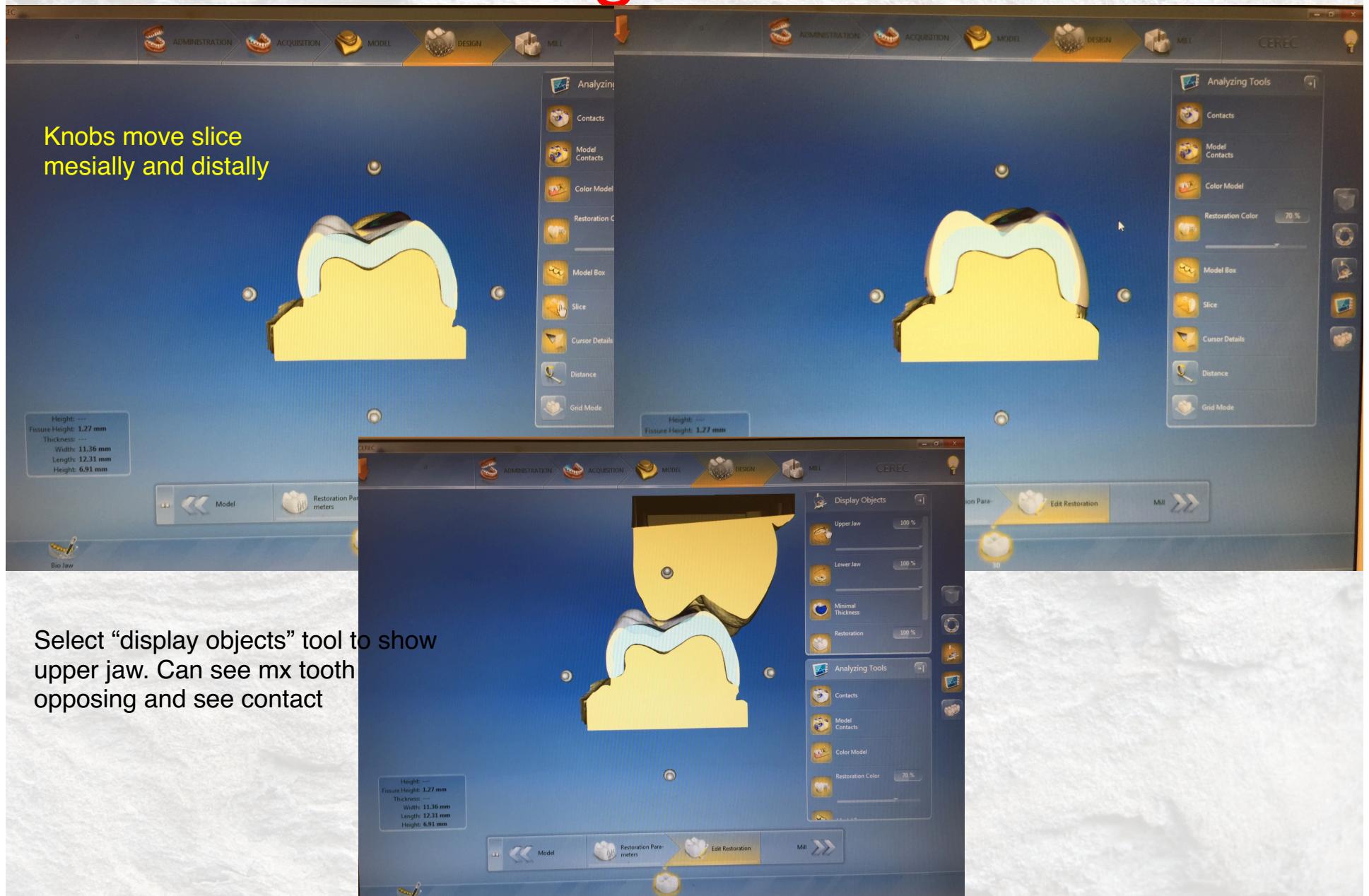
# Design Phase



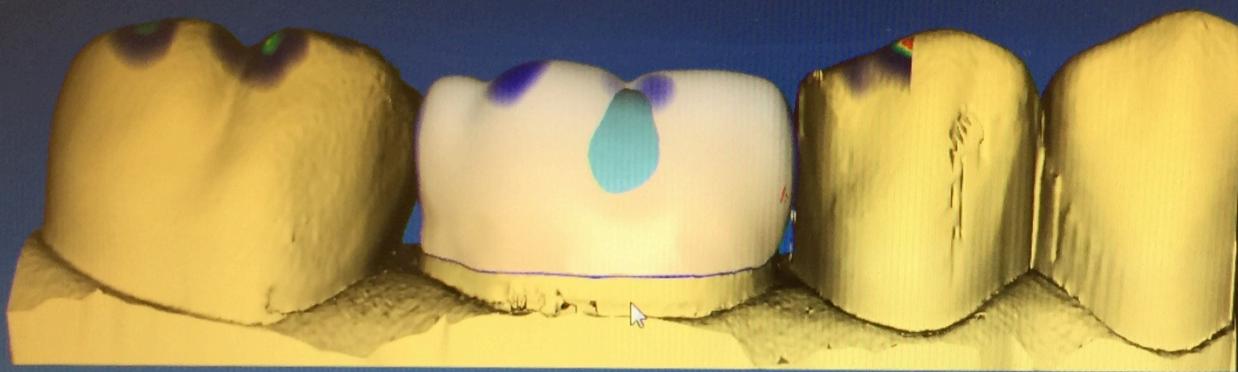
# Design Phase



# Design Phase



# What's wrong with this design?



Note cusp tips of adjacent teeth. Draw straight line from premolar to molar. Design is low and cusps look flat/worn. Not even in occlusion. Look at proposal and see what you can do to modify it.

- Tools**
  - Form
  - Move
  - Shape
  - Biogeneric Variation
  - Recalculate
  
- Display Objects**
  - Upper Jaw 100 %
  - Lower Jaw 100 %
  - Minimal Thickness
  - Restoration 100 %
  - Trimmed Model

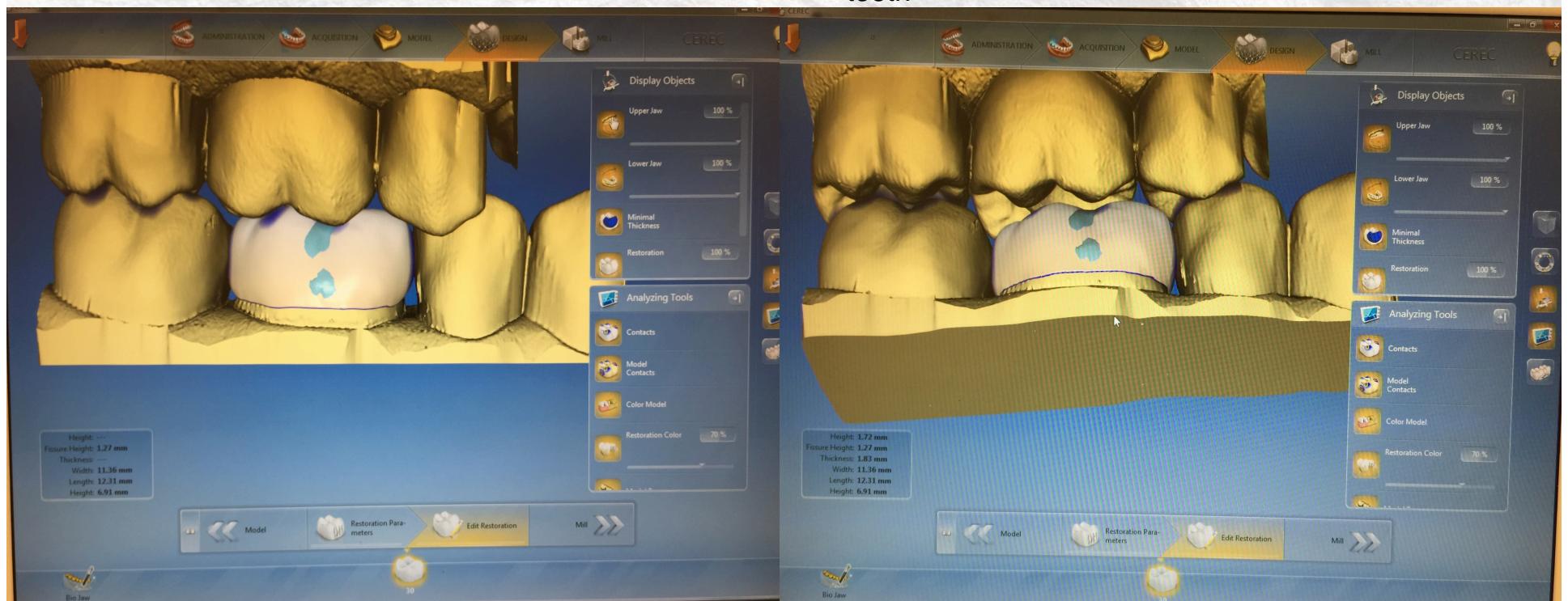


Pin Jaw

# Design Phase

Looks okay here...

If you rotate the model a bit you can see cusps of initial design don't occlude with opposing tooth



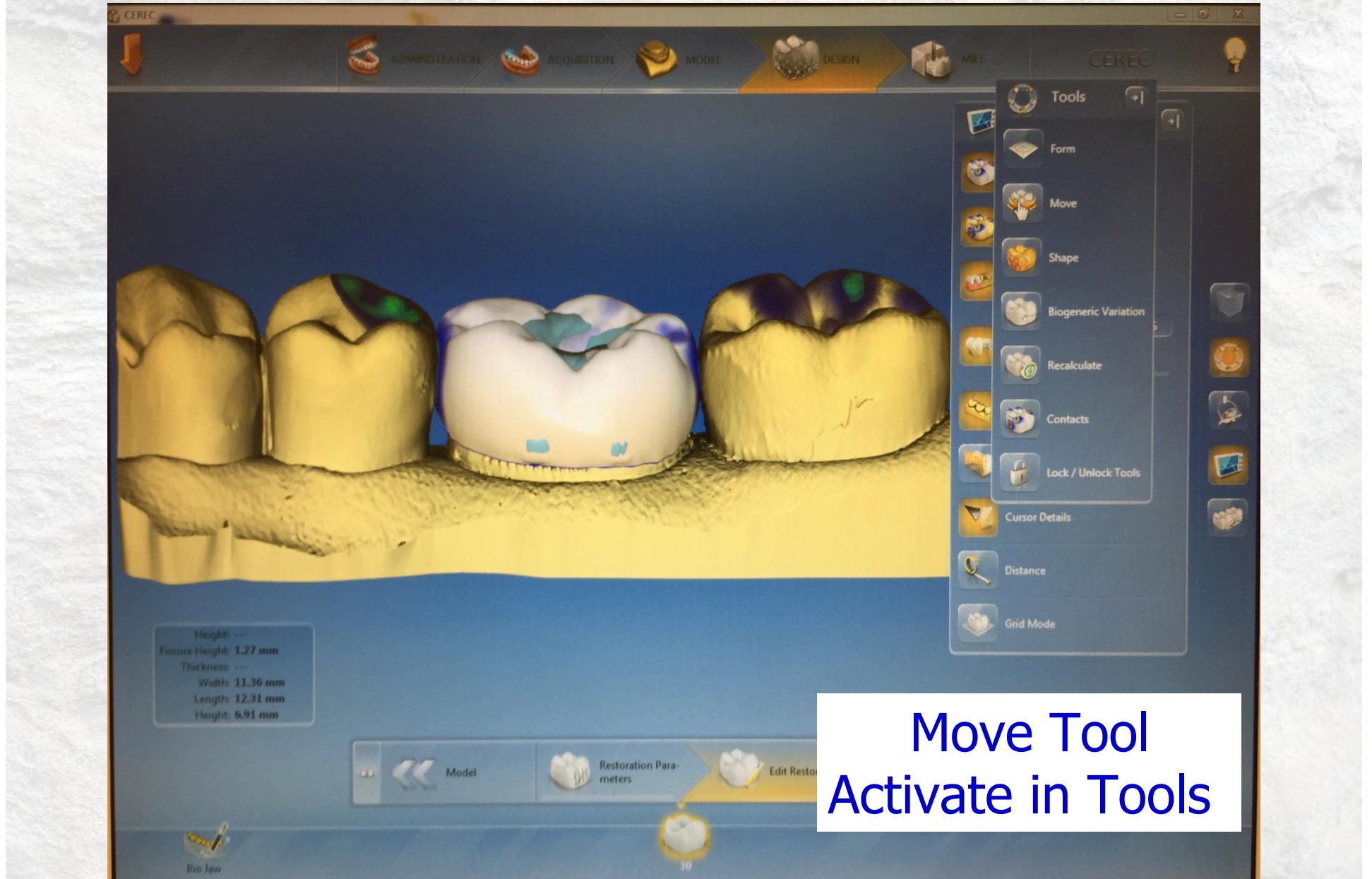
Shape: intermediate changes

Move: large changes (rarely use; designs aren't usually that off)

Form: small changes to design proposal

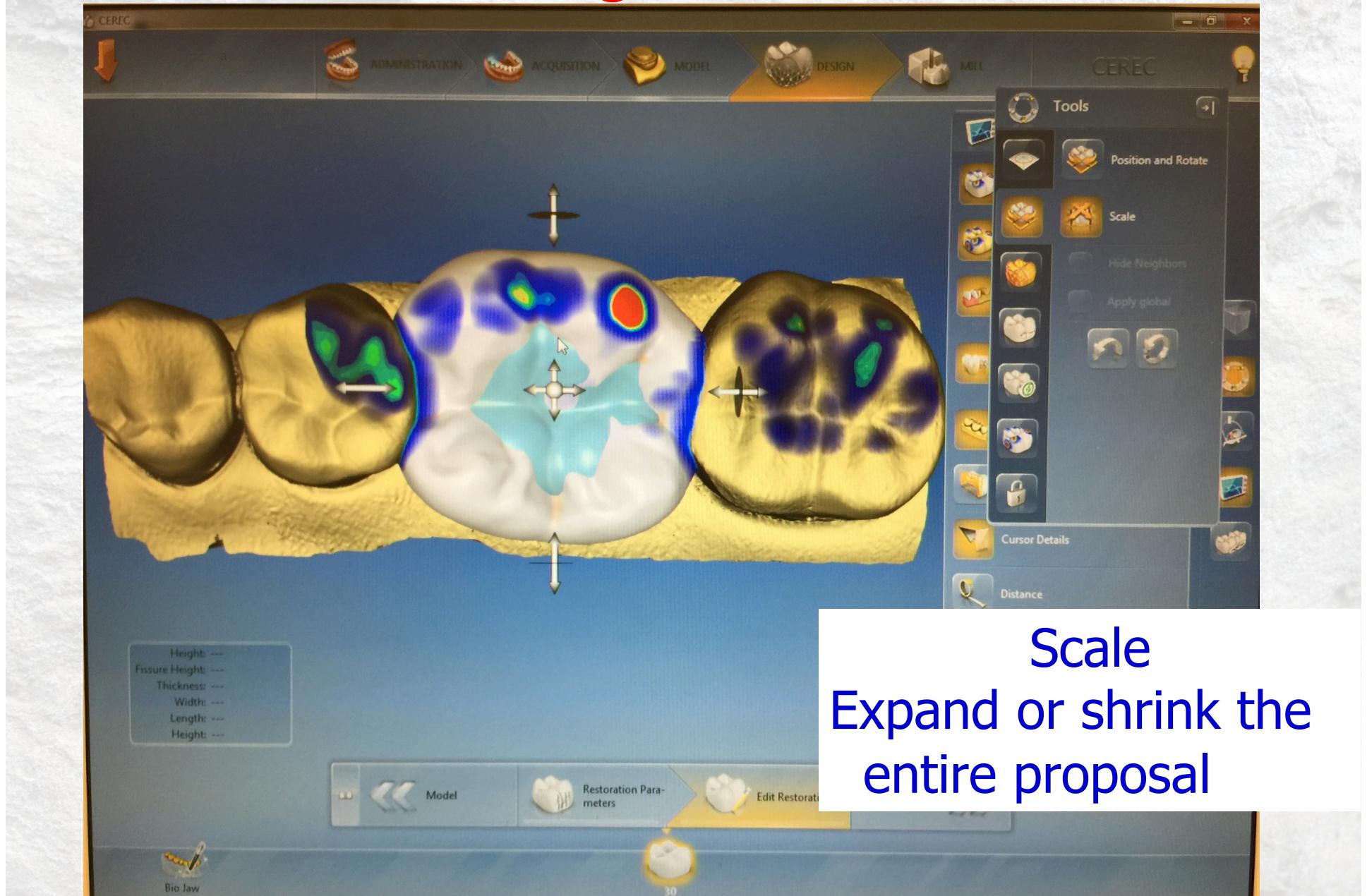
You want to go from big to small

# Design Phase

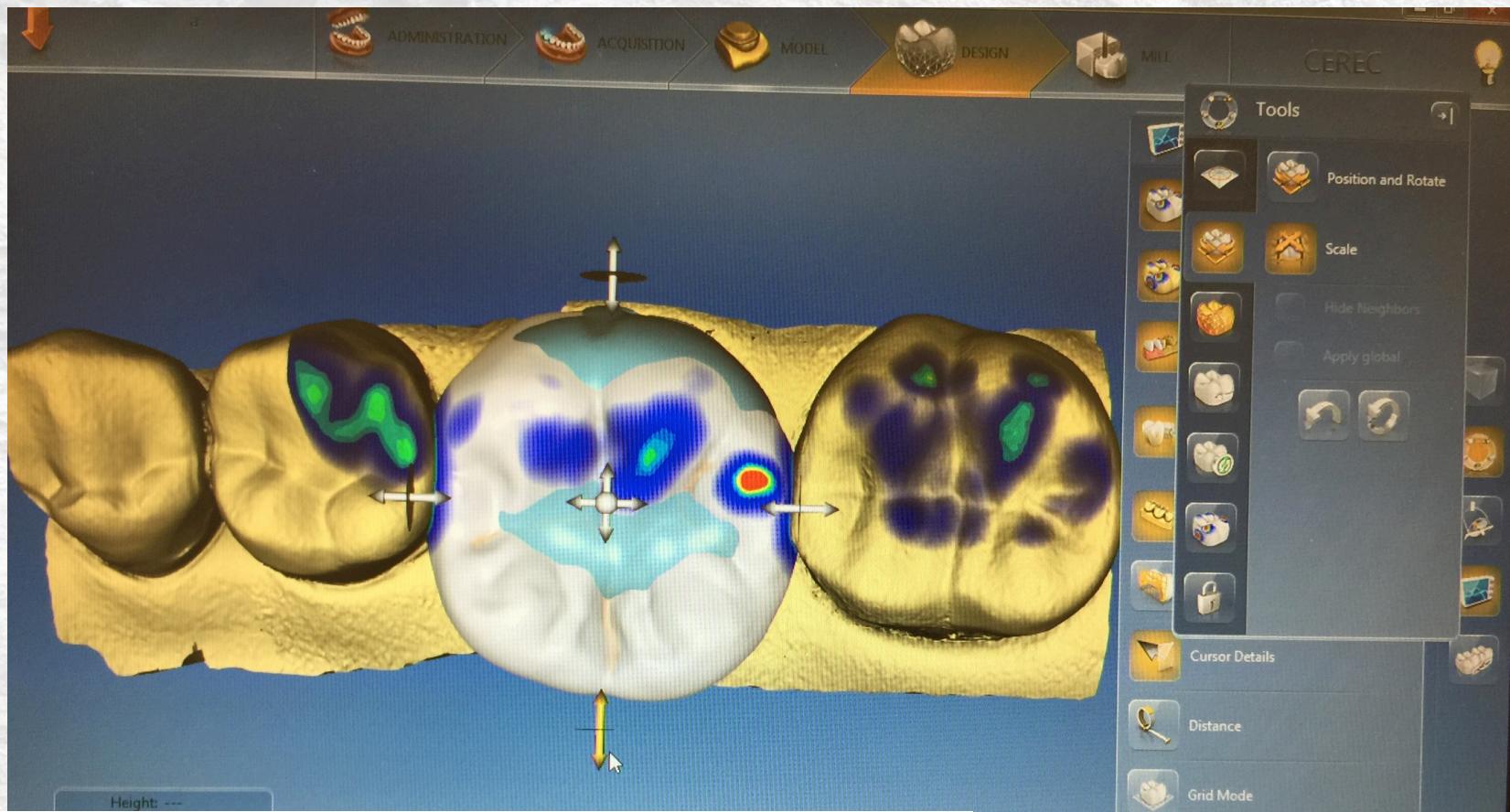


Move Tool  
Activate in Tools

# Design Phase



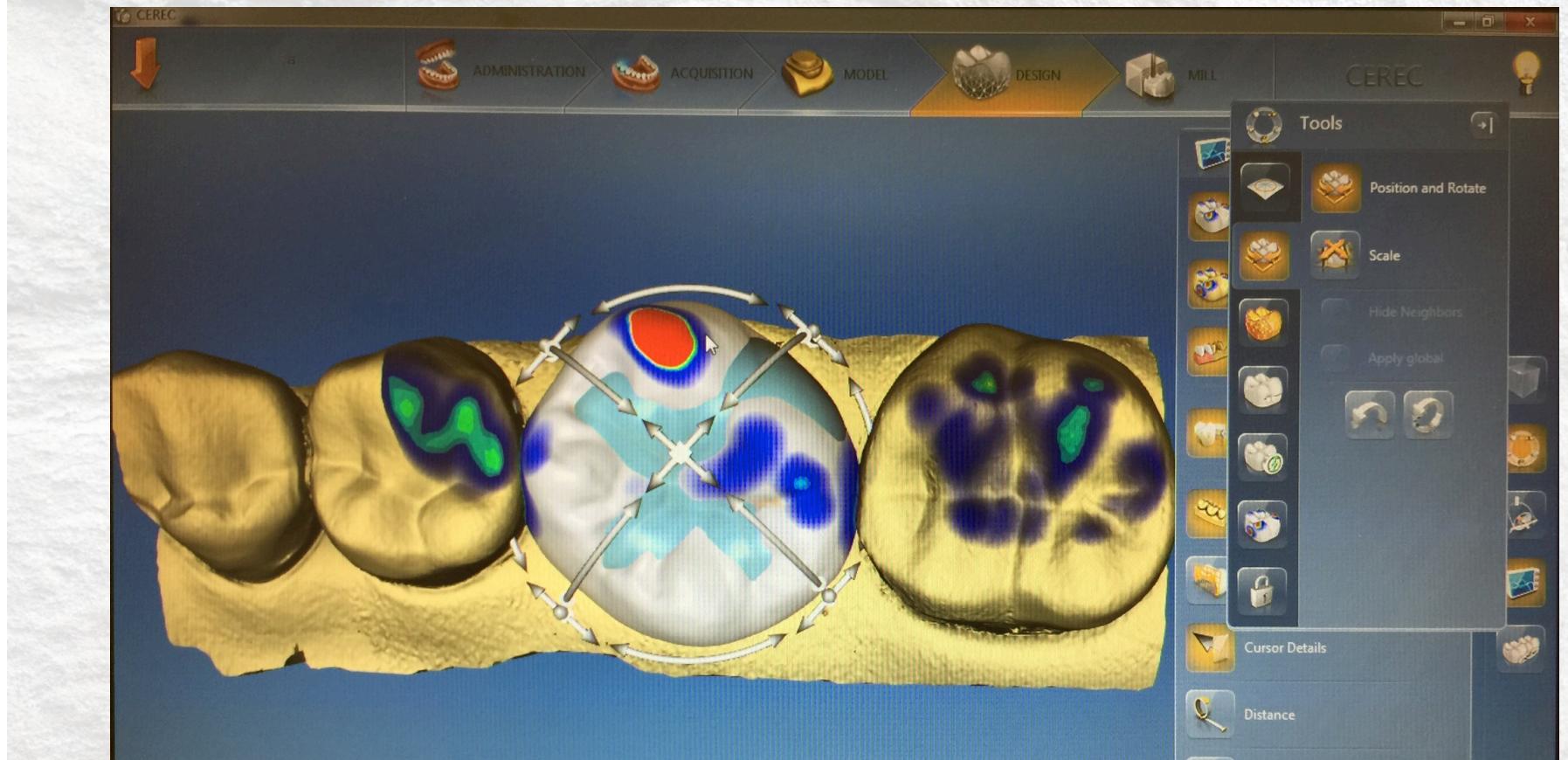
# Design Phase



Scale

Expand buccal-lingual by holding cursor over facial or lingual cusps

# Design Phase



## Move Tool

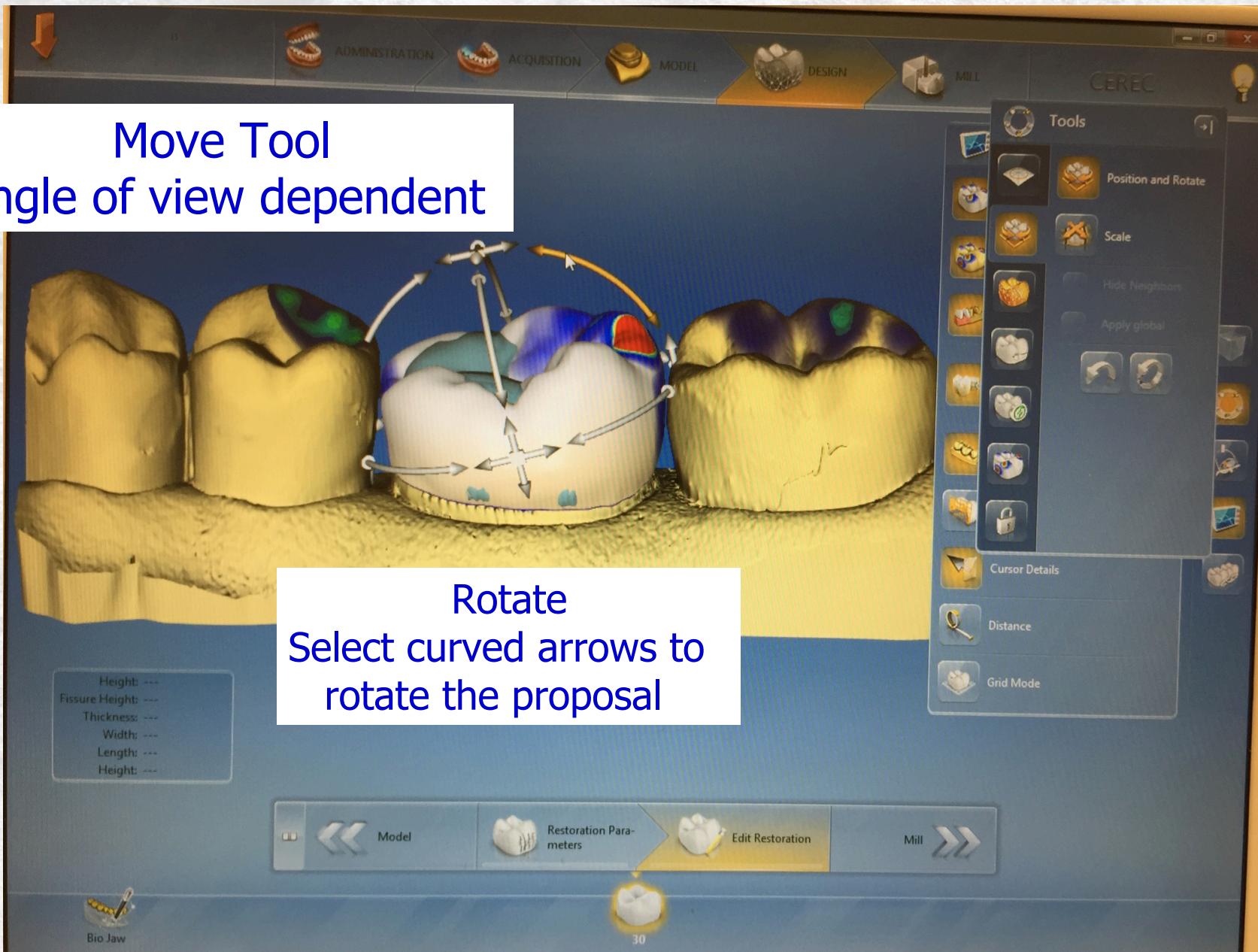
Moves entire proposal around or along one of 3 axis

mesial-distal; buccal-lingual; occlusal-cervical

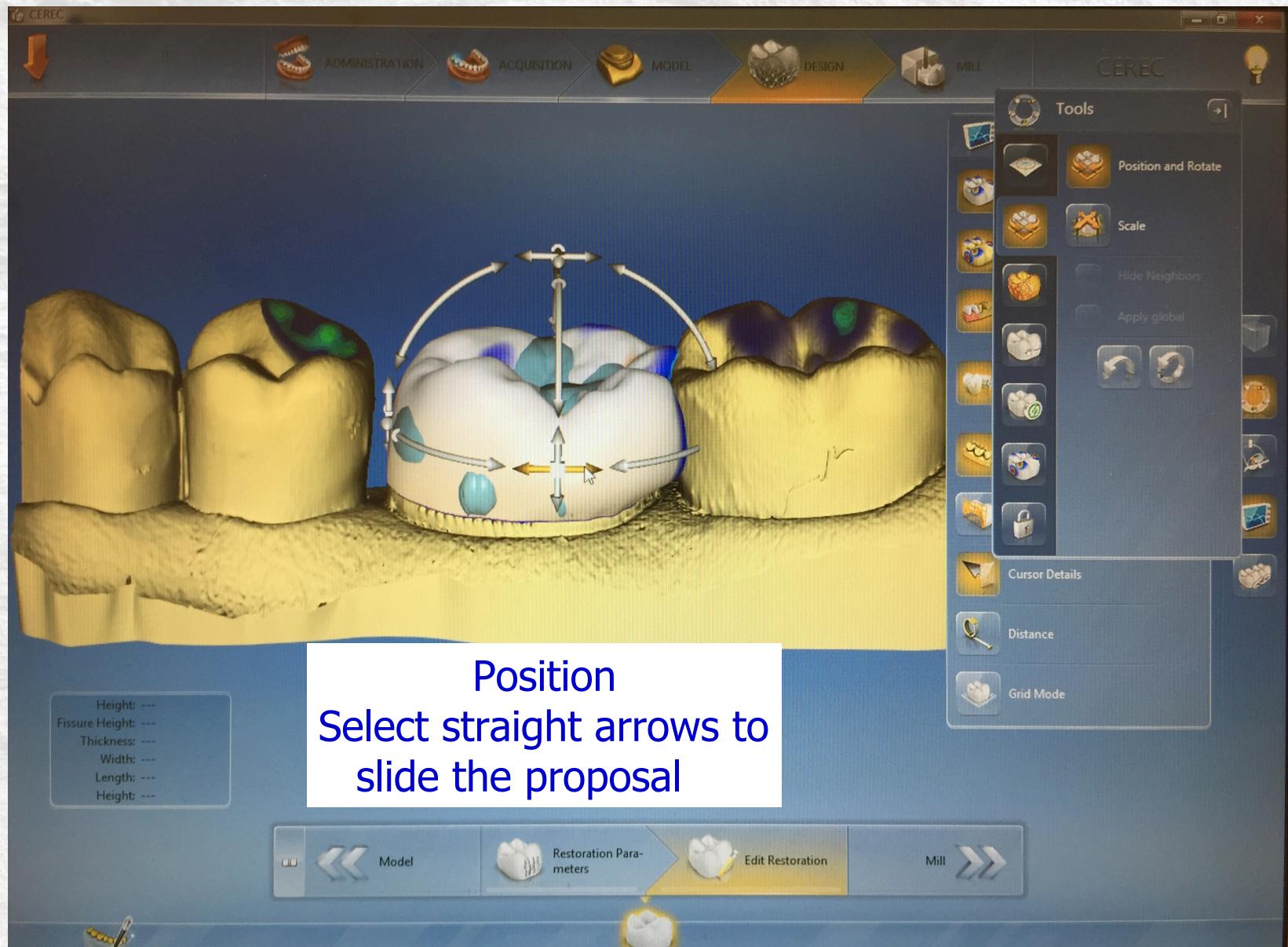
Position > slide the proposal; Rotate > spin the proposal

Will affect occlusal and proximal contacts

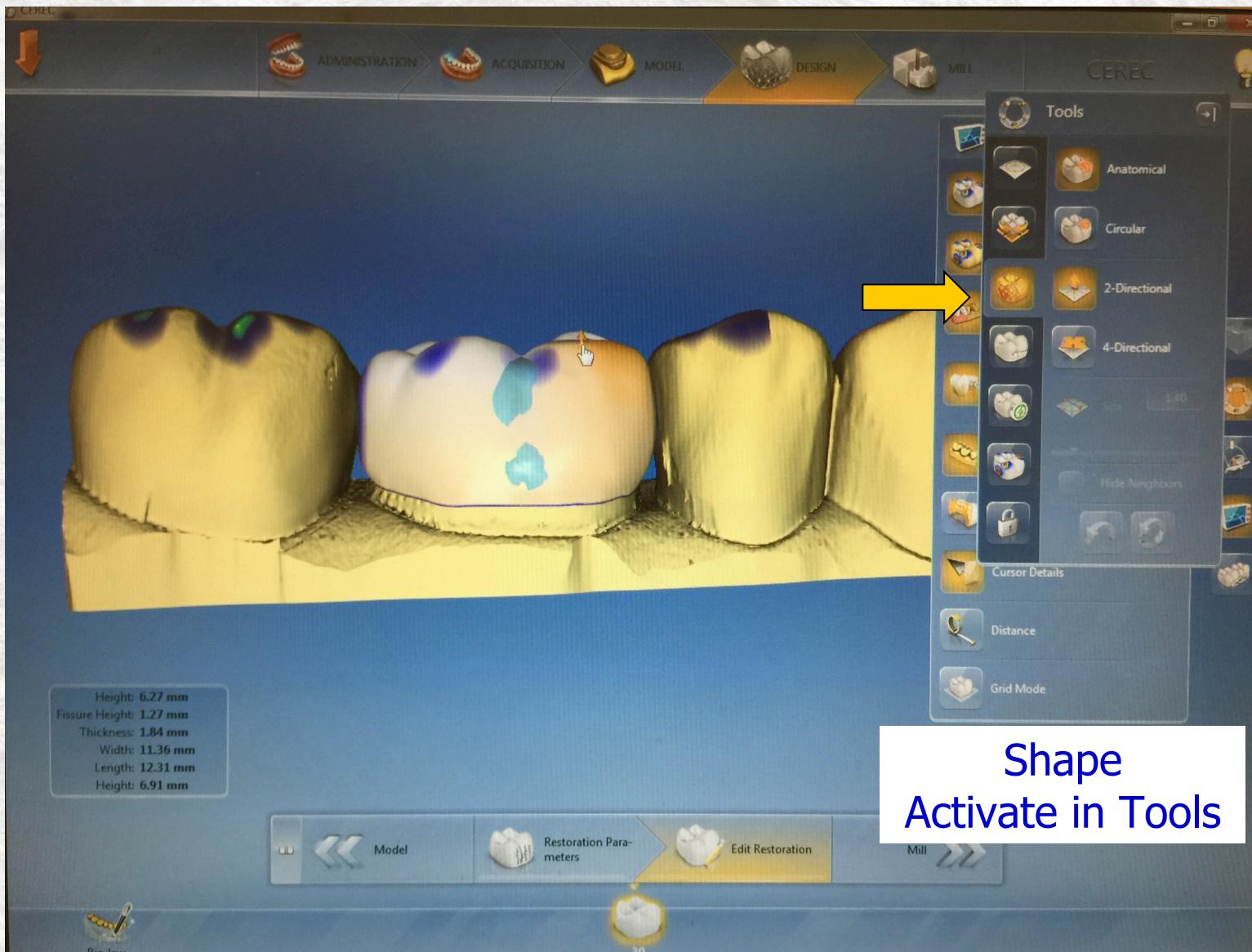
# Design Phase



# Design Phase



# Design Phase



We can determine size of the shape with circular,  
but not anatomical (computer decides)

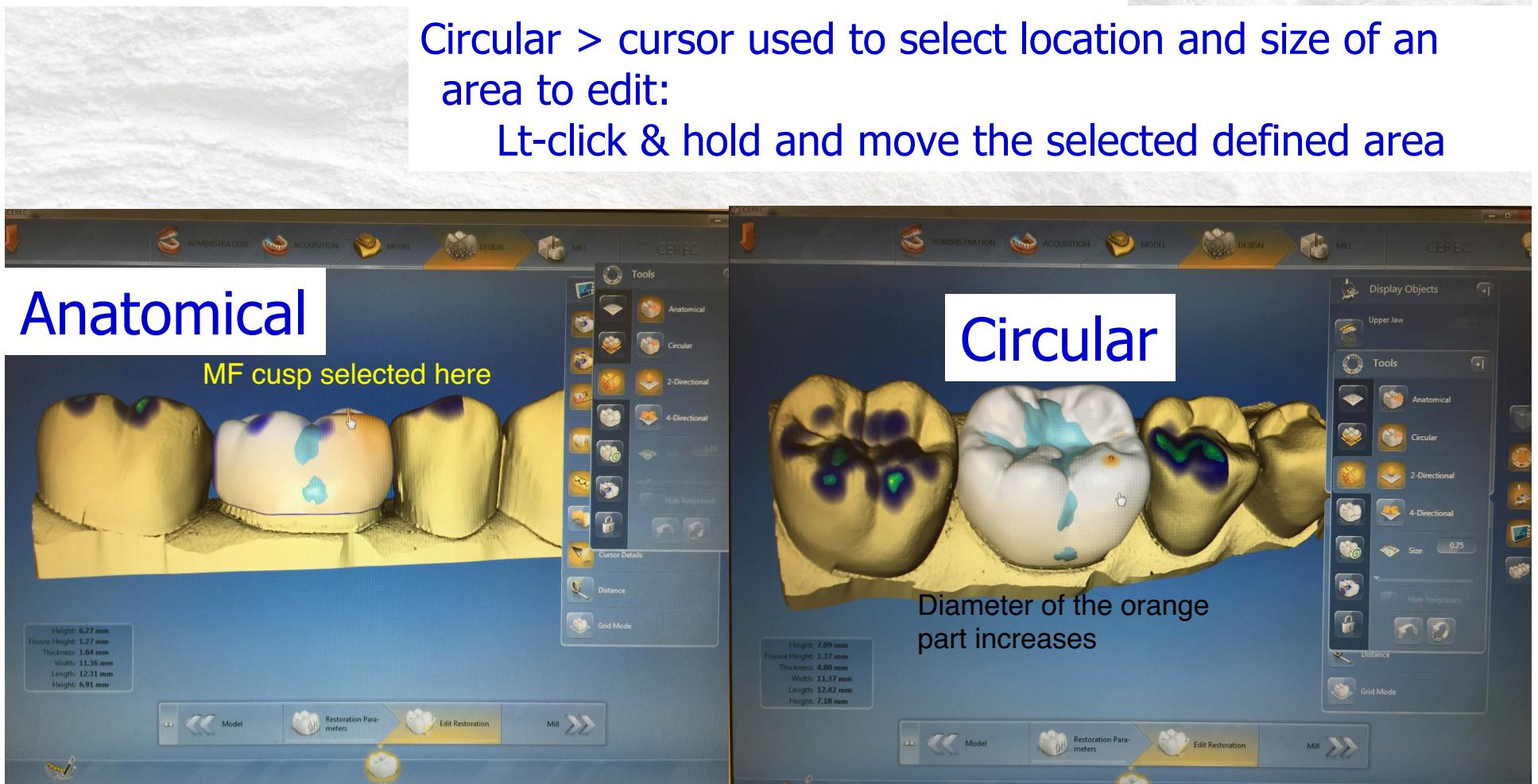
# Design Phase

Anatomical > cursor used to select an anatomic feature to edit:

Lt-click & hold and move the selected feature; cusp, fissure, etc

Circular > cursor used to select location and size of an area to edit:

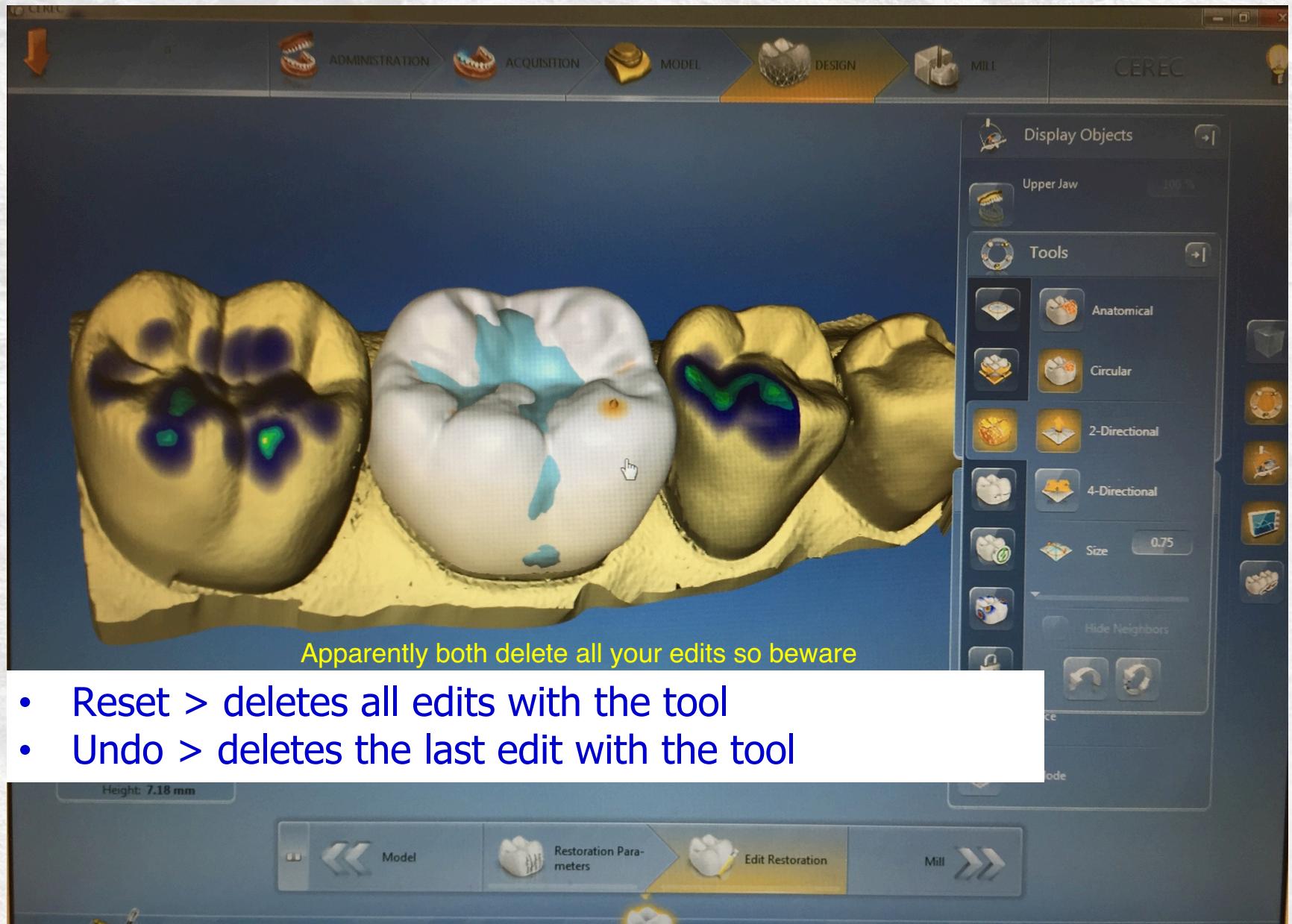
Lt-click & hold and move the selected defined area



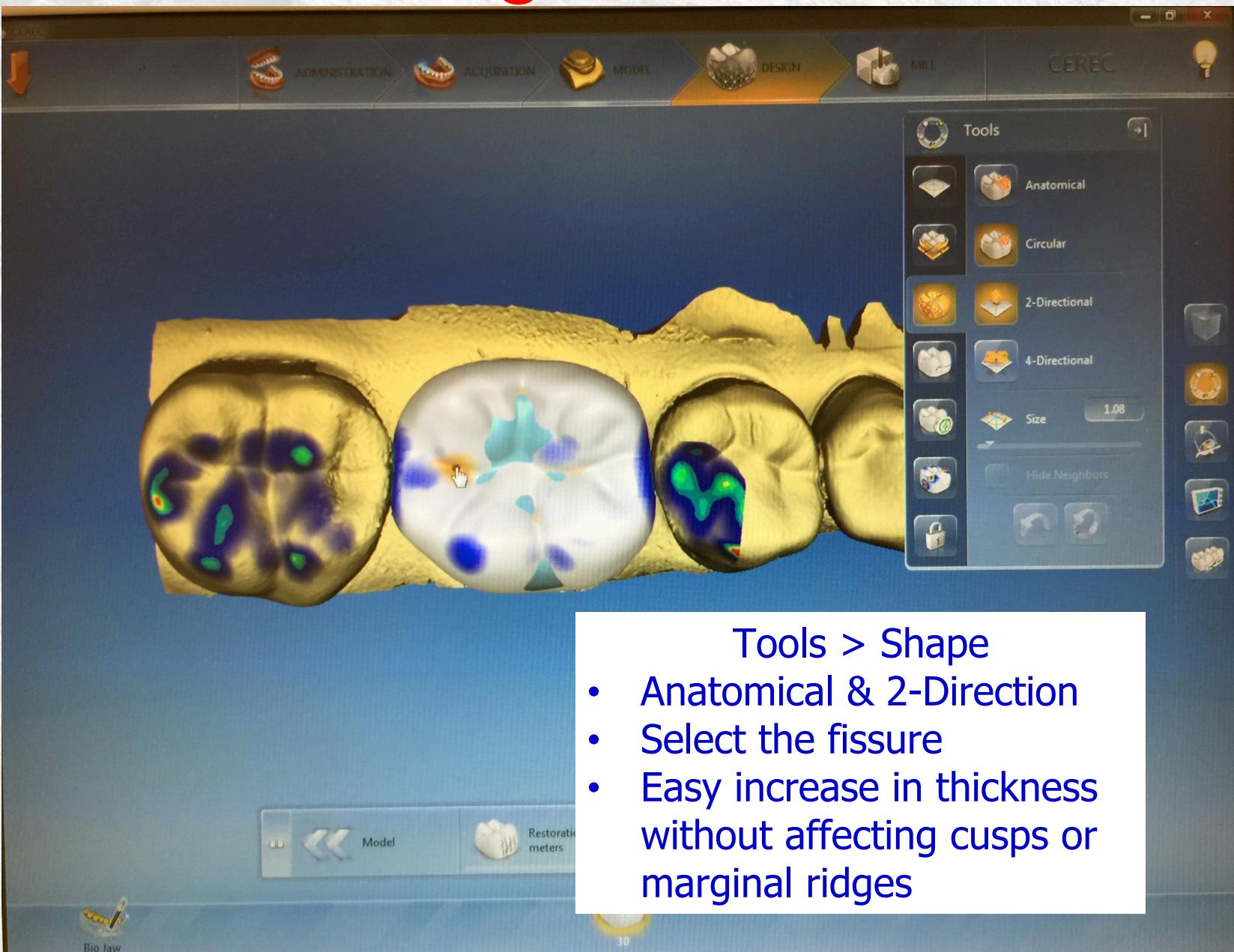
# Design Phase



# Design Phase

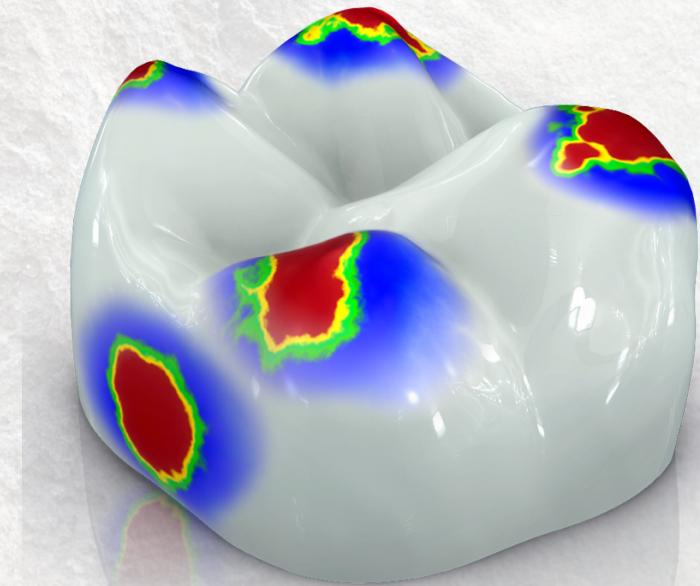


# Design Phase

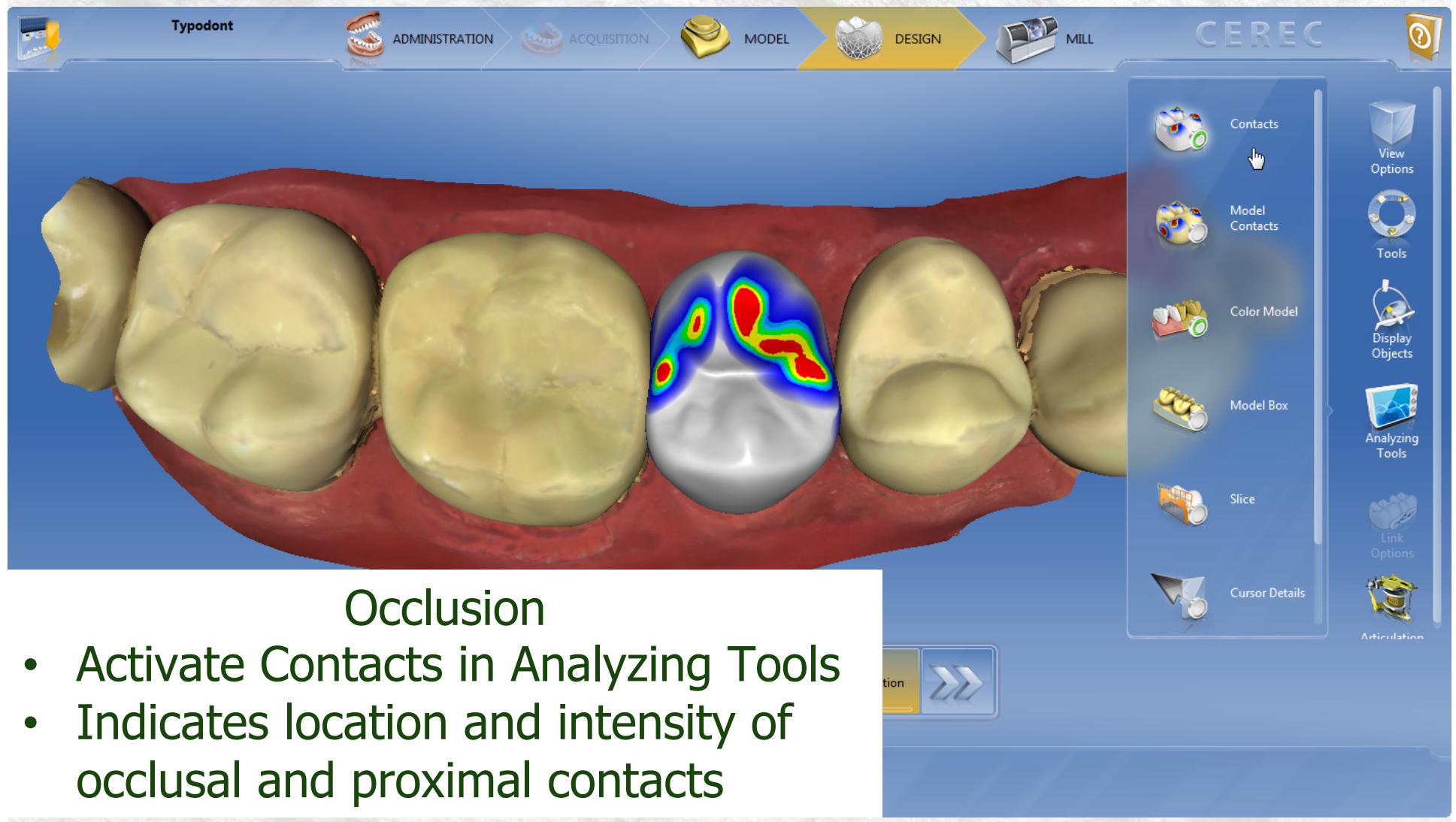


# Graphic Indicators

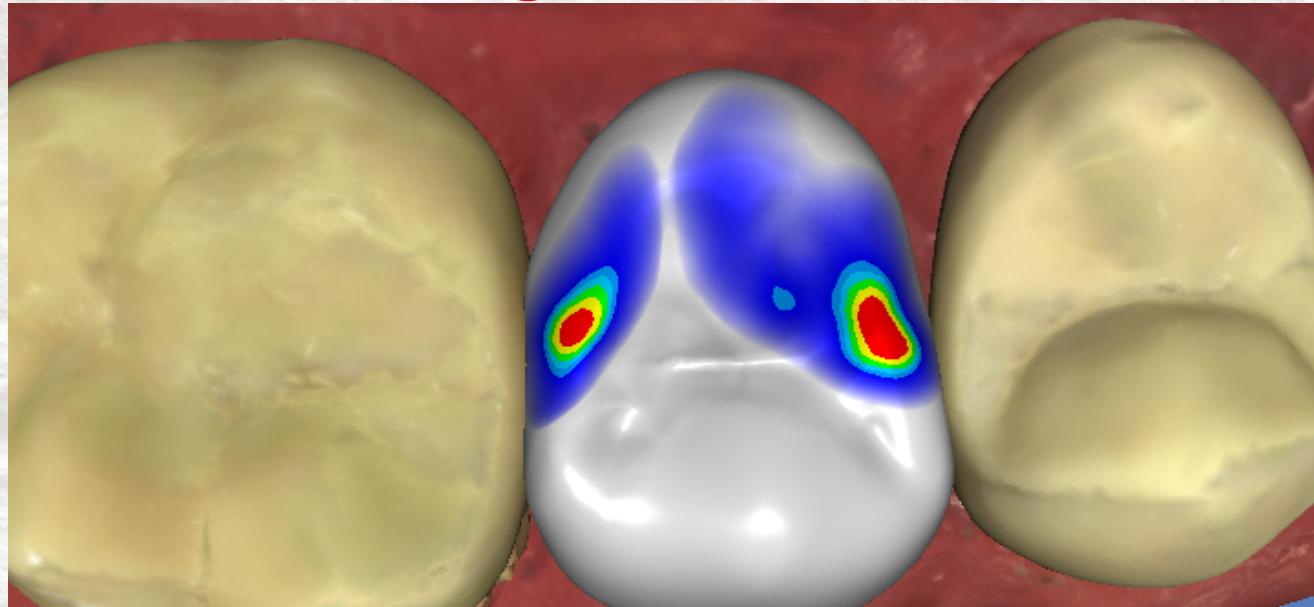
- Need graphic indication of how the changes affect the proposal relative to the dentition
  - Occlusion > contact with the opposing teeth
  - Proximal Contact > contact with adjacent teeth
- Location, size, and intensity of contact are
  - clinically important to determine prior to milling the proposal to minimize chairside adjustment time



# Design Phase



# Design Phase



## Contact Strength

Blue = within 1  $\mu\text{m}$  of contact

Green = 1 - 50  $\mu\text{m}$   
intersection

Yellow = 50 - 100  $\mu\text{m}$   
intersection

Red = >100  $\mu\text{m}$  intersection

## Occlusal Contacts

- Consider plane of occlusal table first
- May improve by rotating or sliding the occlusal table

# Design Phase

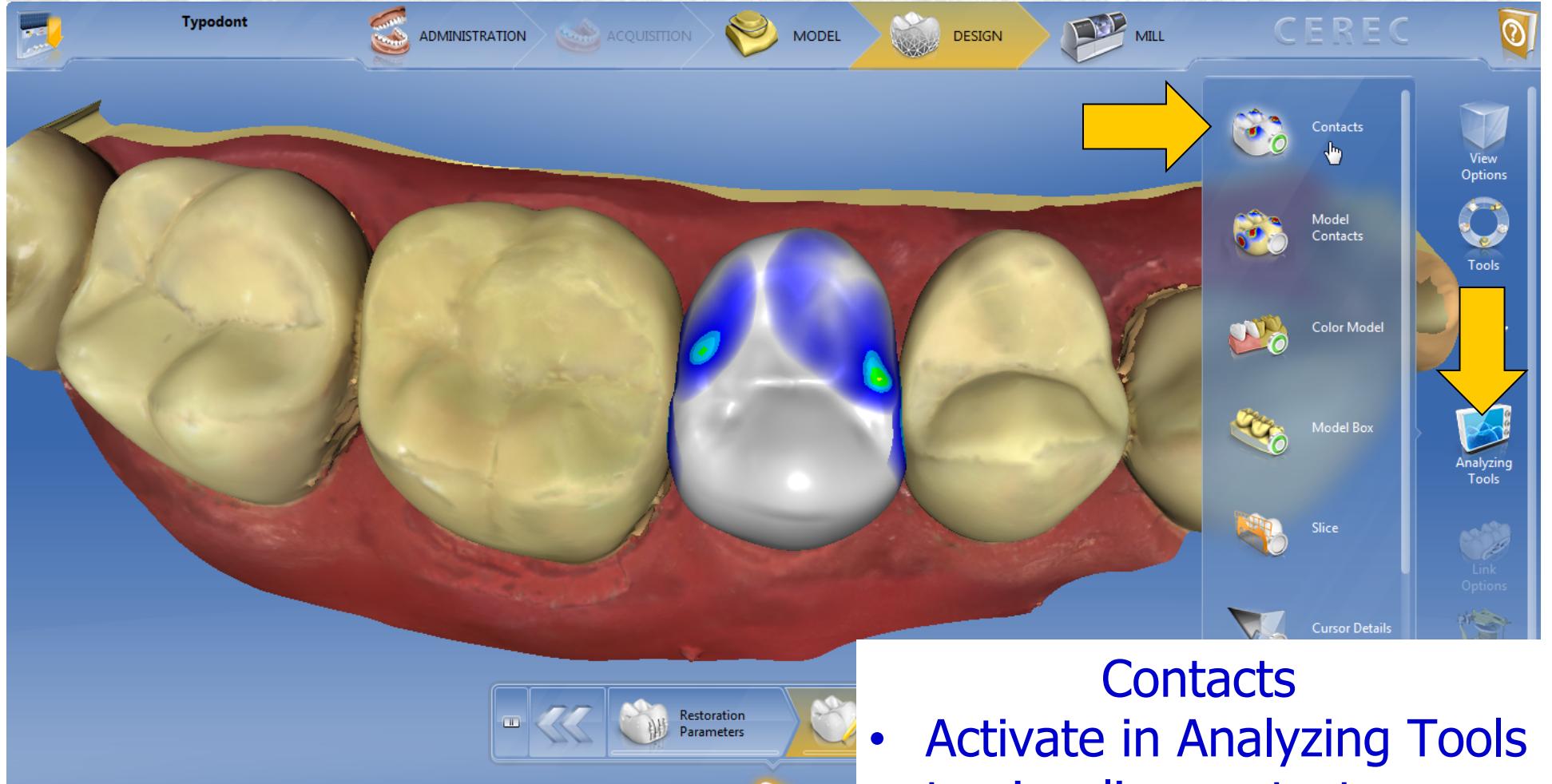
## Proximal Contacts

- Need graphic indication of how the changes affect the proposal relative to the dentition > Proximal Contacts in Analyzing Tool
- Proximal contact anatomy
  - Should be an area, not a point
  - Molar contacts larger than bicuspid contacts
  - Generally located in the middle to occlusal 1/3
- Over-build the contact to create the correct location and size
- Then reduce the intensity of the contact to create the desired “tightness”

Want occlusal contacts on cusp tips and flat areas.  
So marginal ridges and central fossa.

CEREC usually gives contacts on slopes -> adjust  
contours and anatomy

# Design Phase



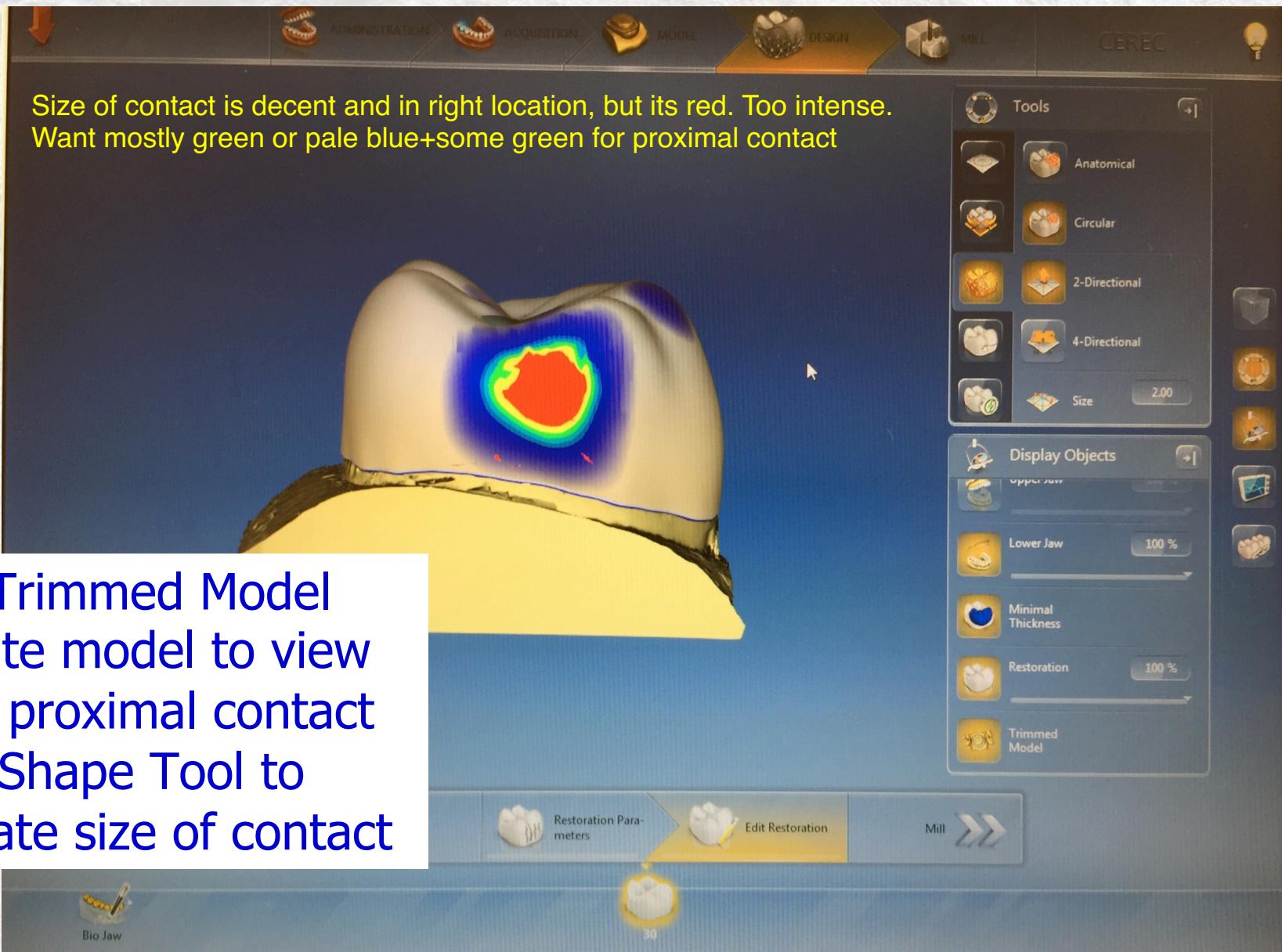
**Contacts**

- Activate in Analyzing Tools to visualize contacts

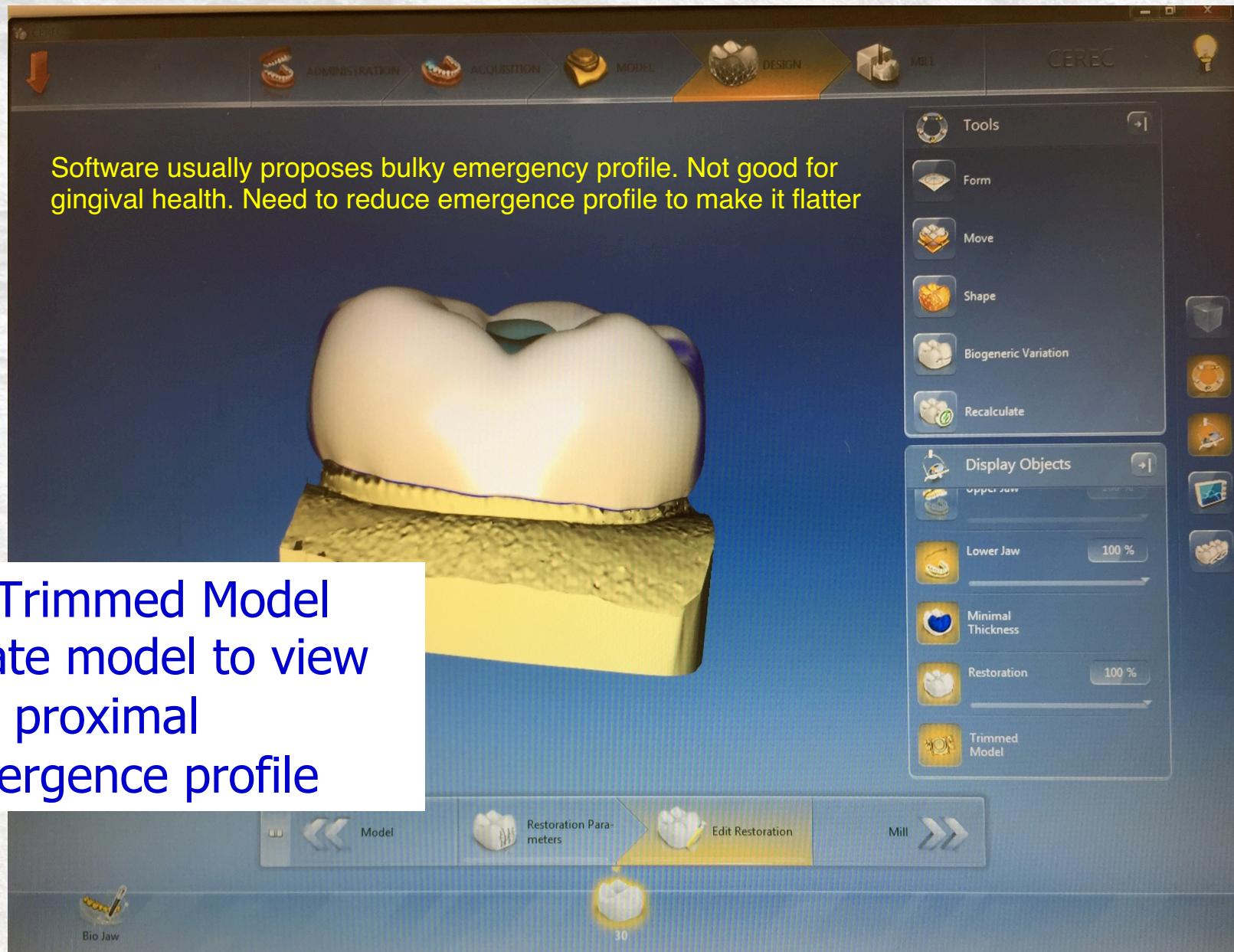
# Design Phase



# Design Phase



# Design Phase



# Design Phase

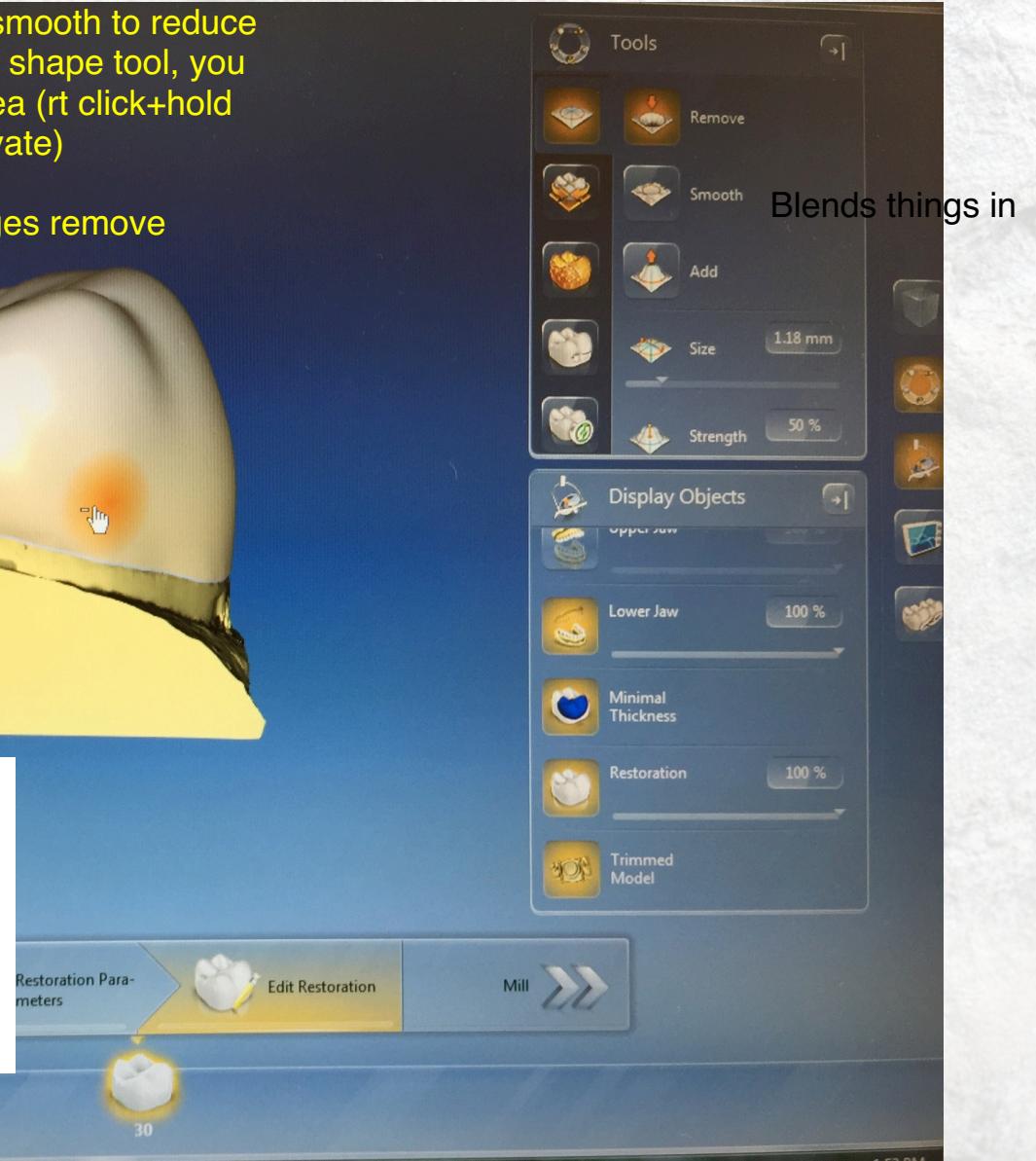
Use form tool (top). Select remove or smooth to reduce bulkiness at gingival margin. Similar to shape tool, you can change the size of the affected area (rt click+hold changes diameter; lt click+hold to activate)

Smaller changes smooth, larger changes remove

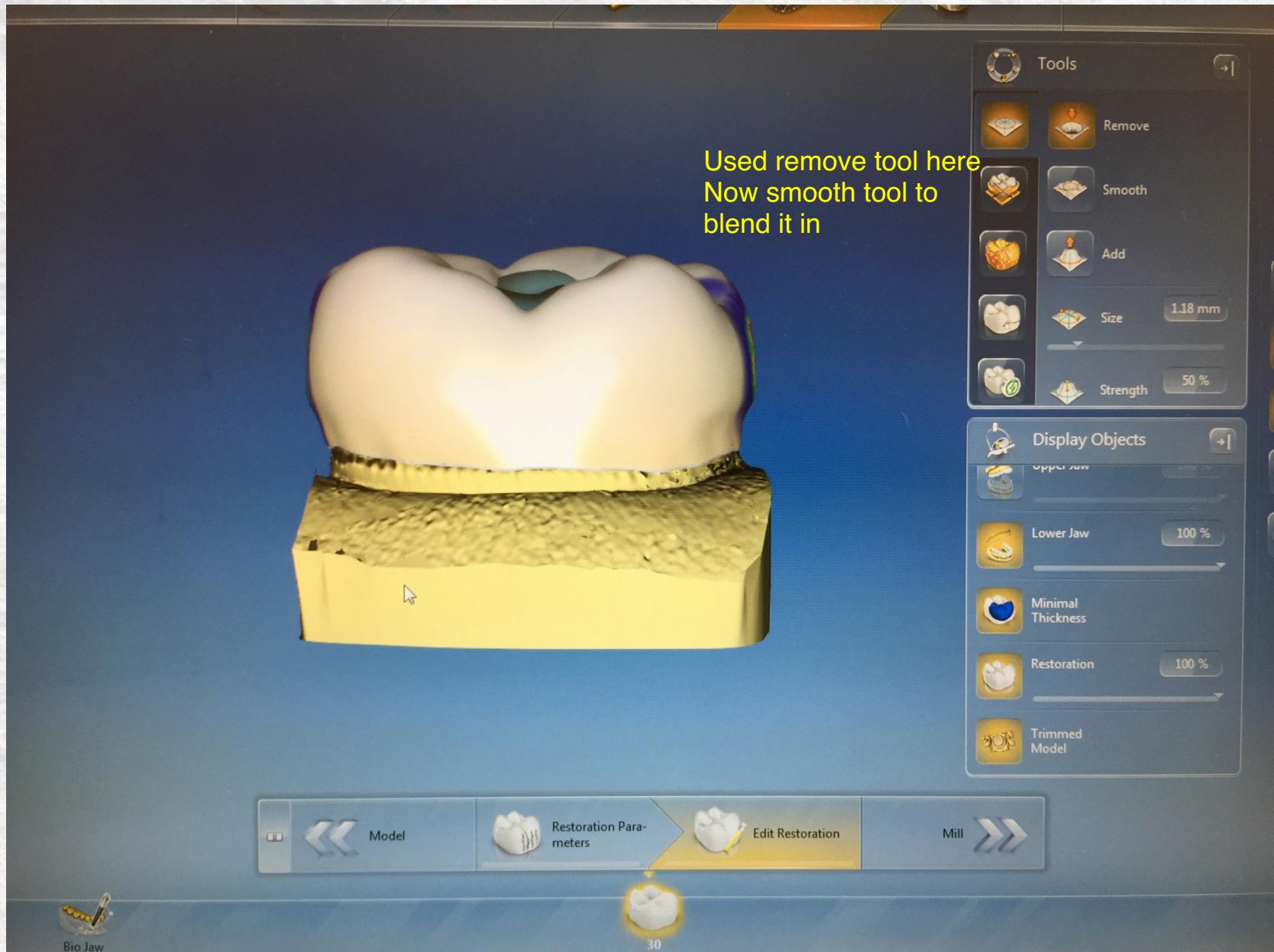


Trimmed Model

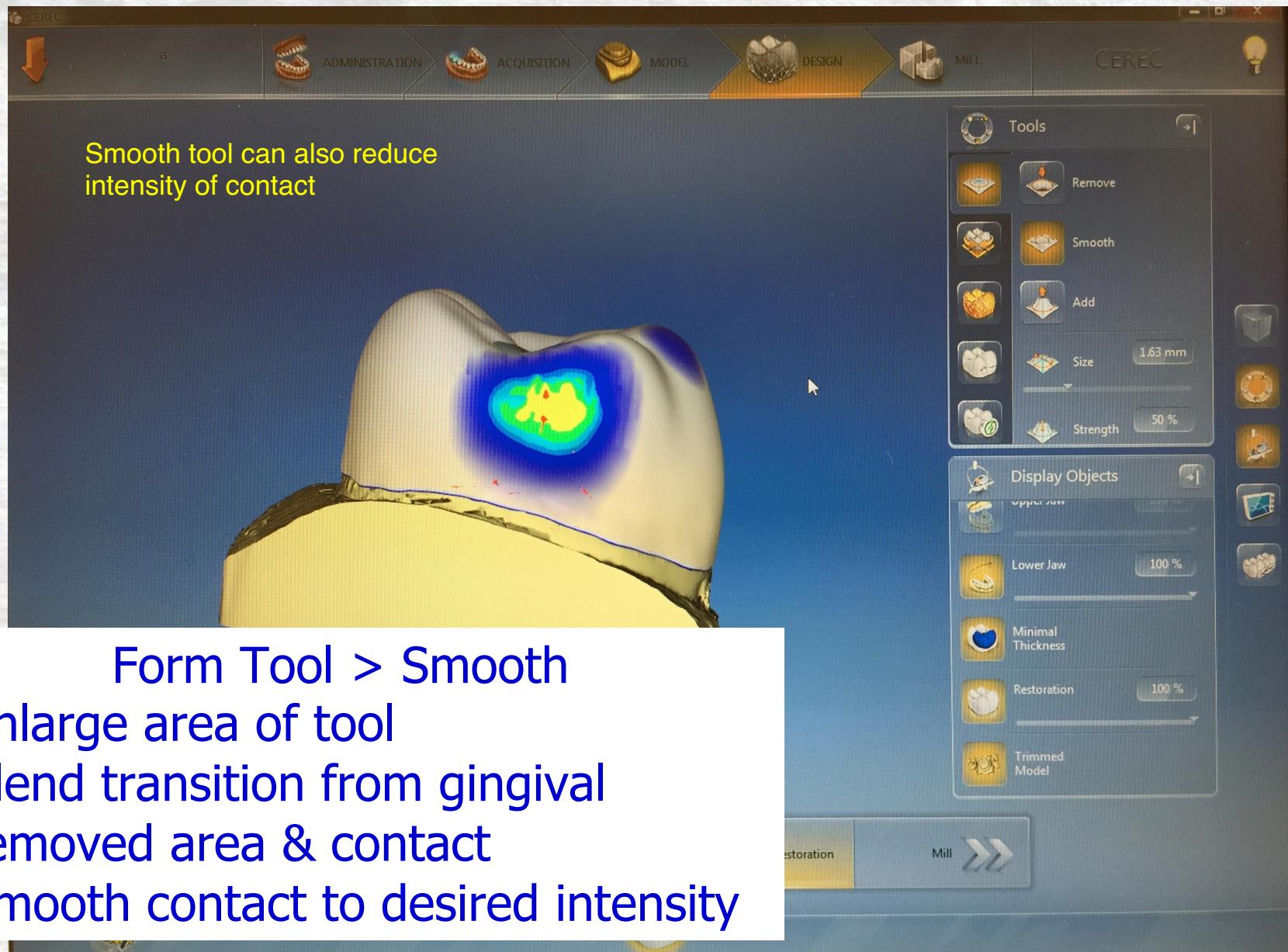
Rotate model to view the proximal & use remove or smooth tool at gingival



# Design Phase



# Design Phase



# Design Phase

