



UOP OKU Presentation

The utility of 3D printing in the management of an endodontic microsurgery case with anatomical complexity.



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Paresthesia after endodontic microsurgery

- Incidence not been extensively studied.
- Mainkar et al (JOE 2020) -
 - 14% overall
 - **38% in premolar surgeries!**
- Permanent damage to patients.
- Lawsuits!





A typical “high risk” case

- #29 - previously treated with symptomatic apical periodontitis.
- Possible reason for failure - impossible to instrument isthmus in C-shaped canal.
- Close proximity to mental foramen.





A typical “high risk” case

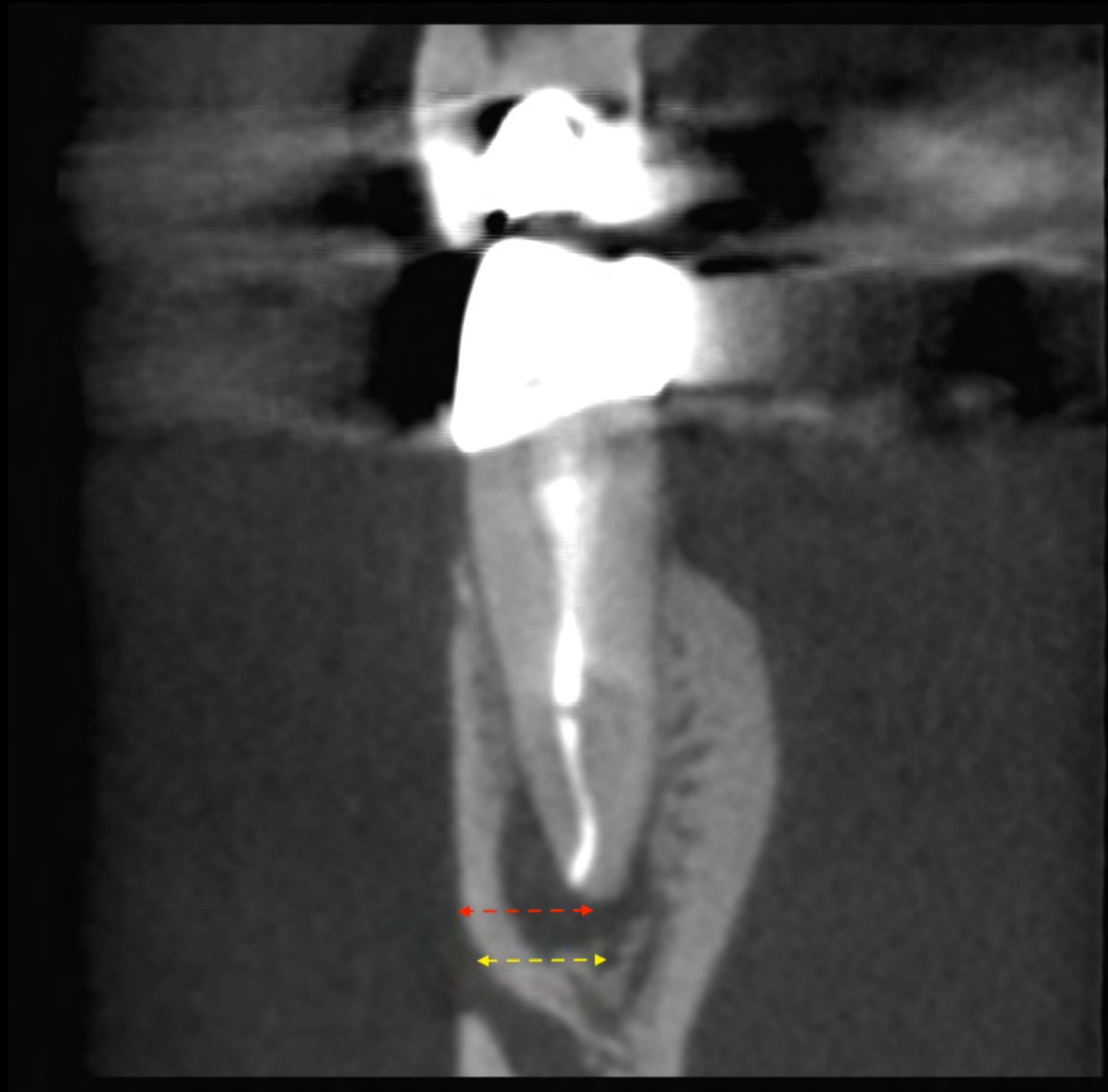
- #29 - previously treated with symptomatic apical periodontitis.
- Possible reason for failure - impossible to instrument isthmus in C-shaped canal.
- Close proximity to mental foramen.
- But most importantly...





- **Red** - level of anatomic apex corresponding to edge of mental foramen.
- **Yellow** - level at which traditional osteotomy would extend.

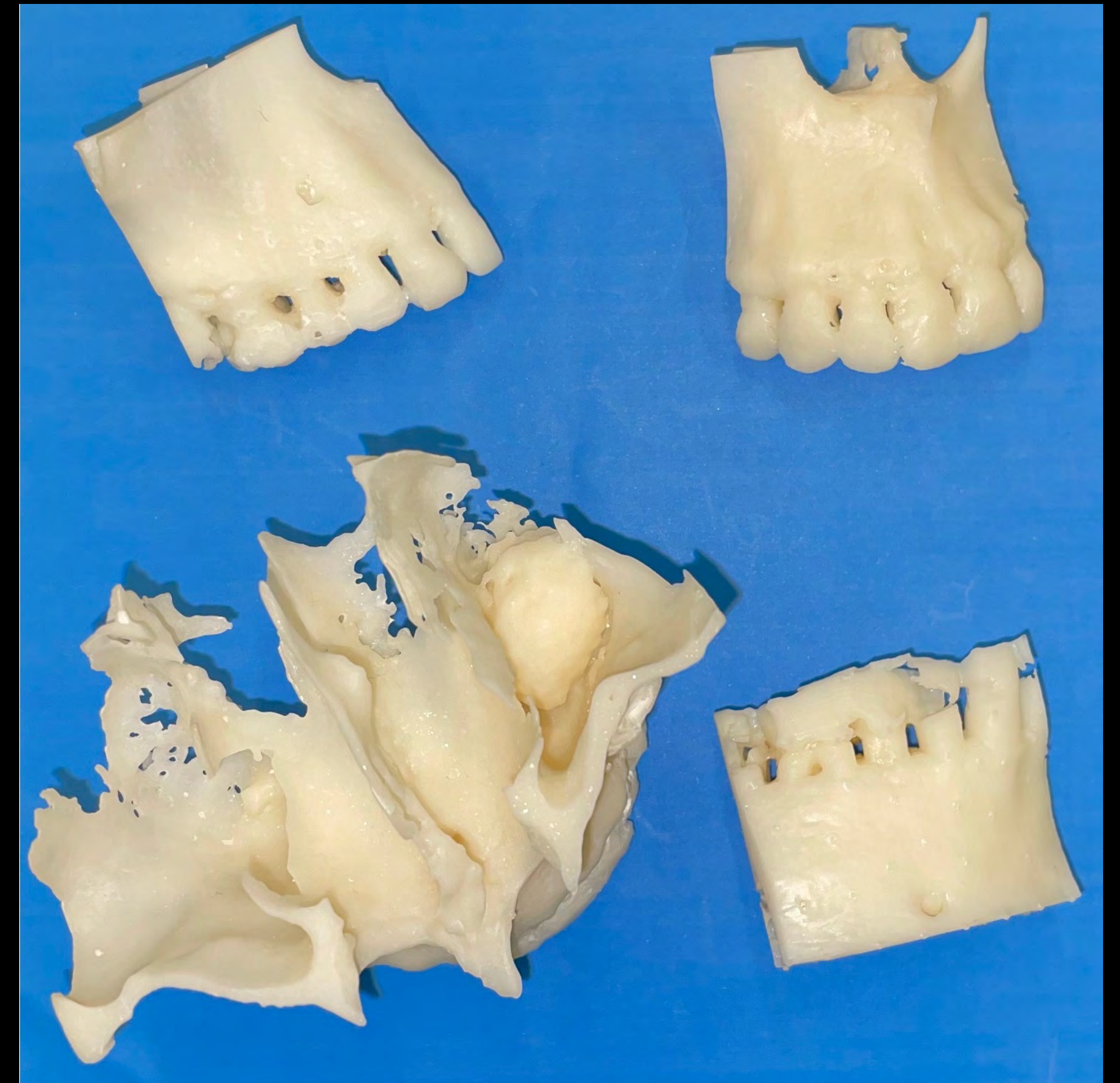
DANGER





3D Printing to the rescue!

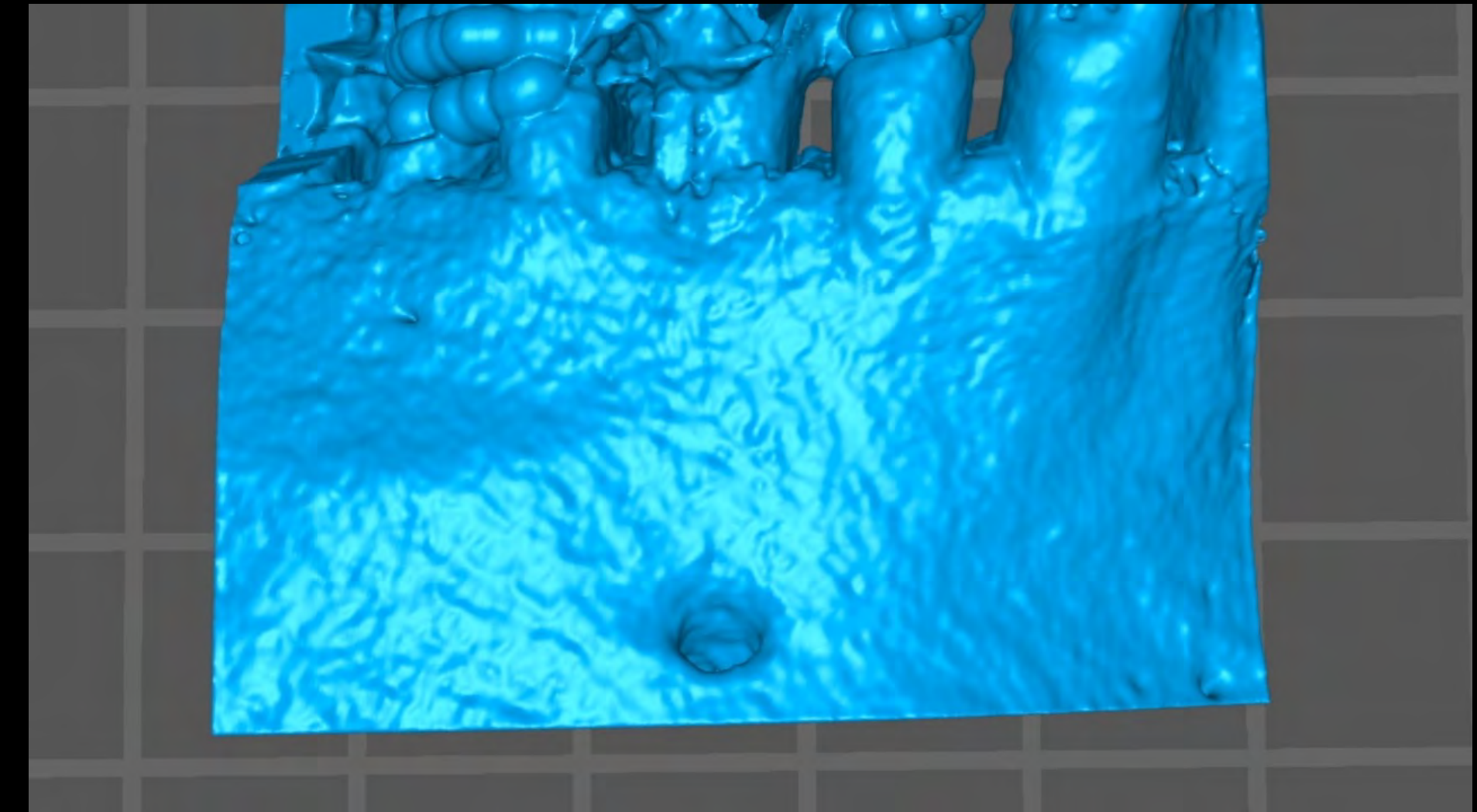
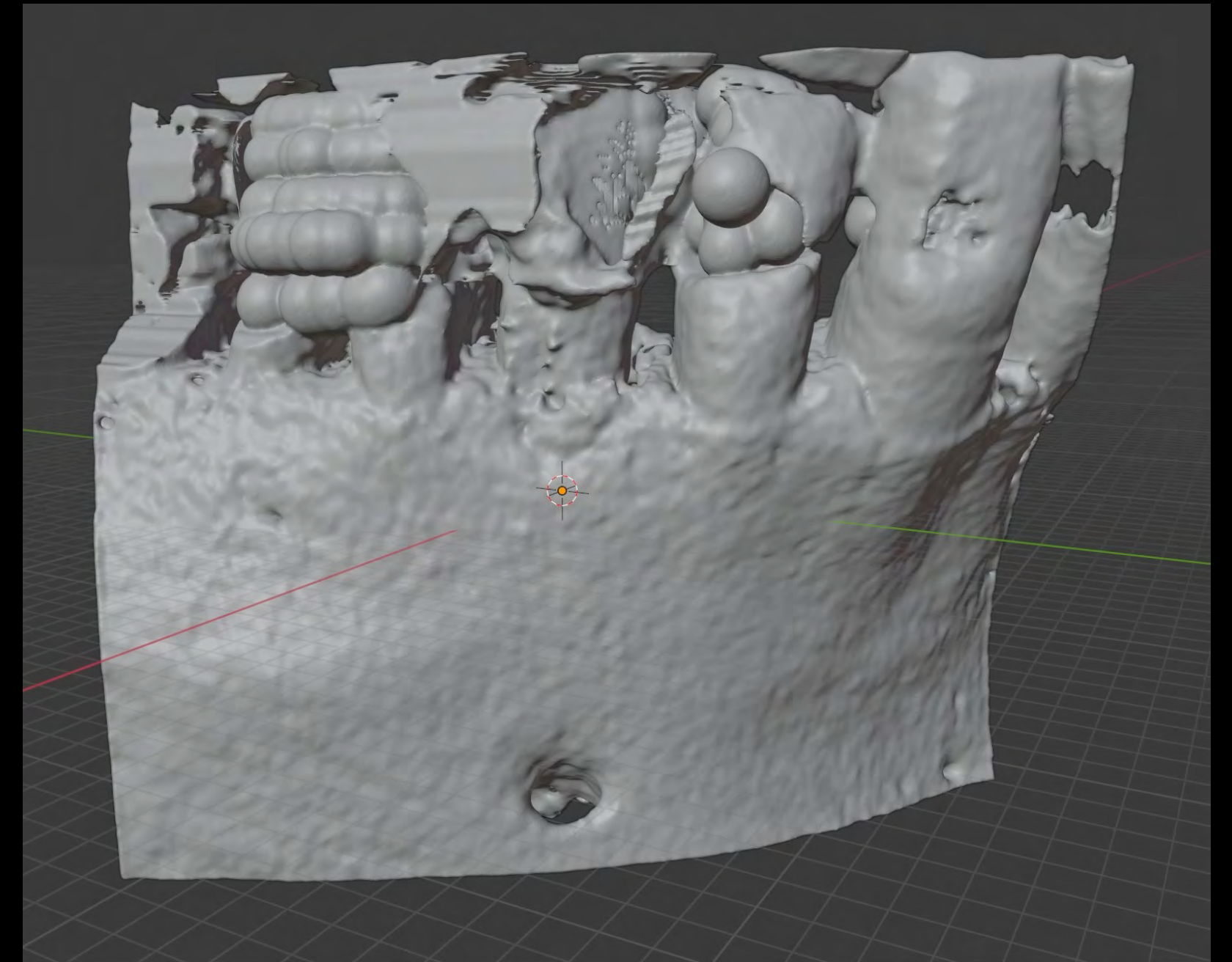
- Methodology and application ideas conceptualized and developed by the presenter.
- Several microendodontic surgical procedures already performed with the aid of 3D printed models at UOP Postgrad Endo.
- Unique to UOP.
- Subject of ongoing research in the Department of Endodontics.





3D Printing to the rescue!

- Converted CBCT DICOM files to 3D printable “.stl” files.
- 3D printed the model.
- Created a suck-down stent on the model.
- Marked the mental foramen and retraction grooves.





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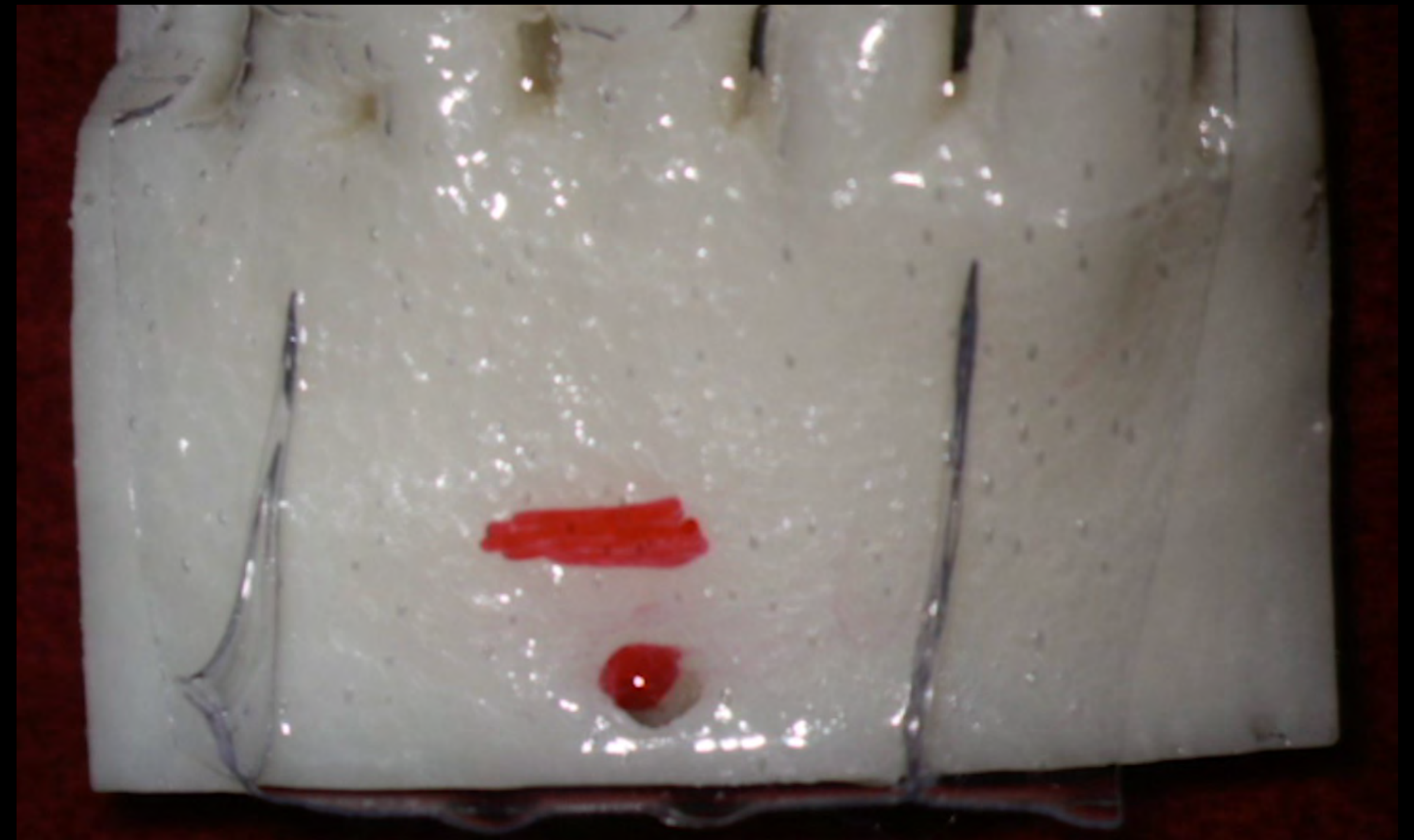
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Postoperative Radiograph @ 6 weeks





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No paresthesia!



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- Avoided complication - iatrogenic errors.
- Influenced efficiency - stent acted as a guide.
- Cost 95c!



Conclusion

A CBCT-derived 3D-printed model can be a cost-effective yet valuable tool for the clinician, in terms of surgical efficiency, and for the patient, in terms of risk-abatement, during endodontic microsurgical procedures.



Acknowledgements

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Thank you!

