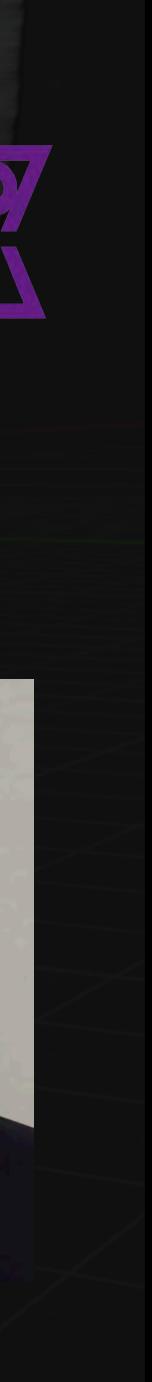


UOP OKU Presentation

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

Shreyas Oza BDS DDS / Lucas Brand DDS - UOP Endodontics 2021







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

Paresthesia after endodontic microsurgery

CLINICAL RESEARCH

Incidence of Altered Sensation after Mandibular Premolar and Molar Periapical Surgery



Anshul Mainkar, DDS, Qiang Zhu, DDS, PhD, and Kamran Safavi, DMD, MEd

ABSTRACT

Introduction: Altered sensation is a rare but disturbing adverse event after mandibular premolar and molar periapical surgery procedures, and its incidence is not known. The aim of this study was to determine the incidence of altered sensation after periapical surgery procedures in mandibular premolars and molars. Methods: This retrospective study includes patients who received periapical surgery in endodontic clinics of a university hospital in the United States. Data were obtained by review of the records for patients who met the inclusion criteria, and statistical analysis of possible predictive factors was performed using the 2-tailed Fisher exact test ($\alpha = 0.05$). **Results:** Sixty-two patients (63 teeth, 13 premolars and 50 molars) met the inclusion and exclusion criteria and were analyzed in the study. The first followup visit occurred 3 to 37 days after surgery. Altered sensation was observed in 9 patients. Observation of altered sensation was significantly higher (odds ratio = 7.19) after premolar surgeries (5/13) compared with molar surgeries (4/50). Conclusions: Despite the limited size and retrospective nature of this study, it was concluded that the incidence of altered sensation after periapical surgery appears to be relatively high (14%), with a higher incidence found in premolars compared with molars. (J Endod 2020;46:29-33.)

Altered sensation; apicoectomy; mental nerve; paresthesia; periapical surgery

Altered sensation, most commonly associated with damage to the mental and inferior alveolar nerves, is a rare complication in dental procedures. Altered sensation is a broad term that includes dysesthesia, paresthesia, and anesthesia¹. Dysesthesia and paresthesia are abnormal sensations that can be spontaneous or provoked. The 2 terms differ in that dysesthesia is reserved for sensations that are unpleasant². There is some overlap in the clinical use of these terms because of difficulties in deciding what sensations are considered unpleasant. "Pins and needles" sensation is usually categorized as paresthesia¹. Anesthesia is loss of sensation¹. Altered sensation, especially if long-term or permanent, has a significant impact on a patient's quality of life and can have medicolegal consequences. In a followup study of altered sensation of the trigeminal nerve, patients reported 43% eating disorders, 38%

speech problems, 37% depression, 14% relationship changes, and 13% negative impact on employment as a consequence of the altered sensation³. The mechanisms, etiology, prognosis, and management of altered sensation after dental treatment

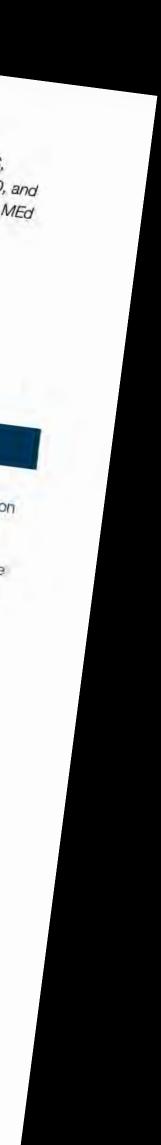
is extensively described in the literature; however, there is minimal scientific knowledge about altered sensation after periapical surgery. Two review articles from 2011 and 2014 did not identify any published case reports about altered sensation after periapical surgery^{4,5}. The significance, prevention, and treatment of altered sensation after endodontic surgical procedures are discussed in texts and published articles^{6,7}; however, reports on altered sensation after periapical surgery are rare

SIGNIFICANCE

This study reported the incidence of altered sensation after mandibular posterior periapical surgeries and discussed possible predictive factors for altered sensation.

From the Division of Endodontology, University of Connecticut Health, Famington, Connecticut

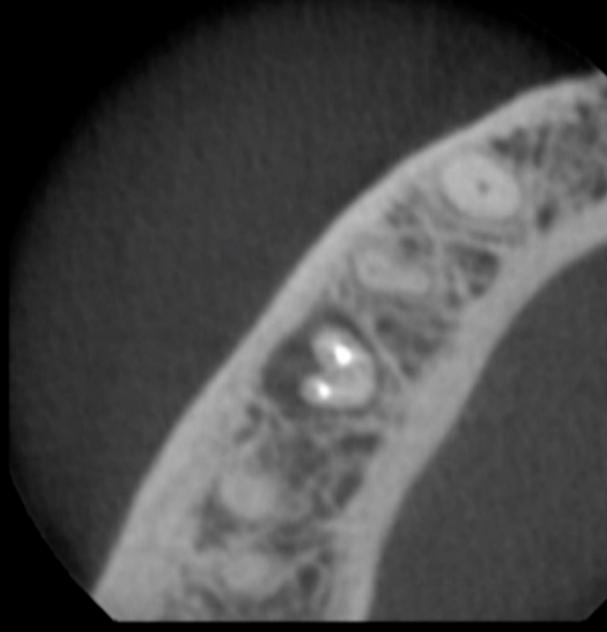
Address rou





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



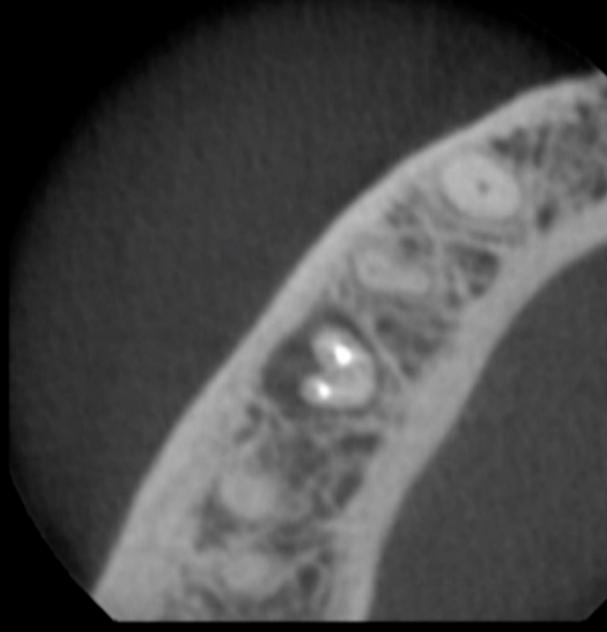




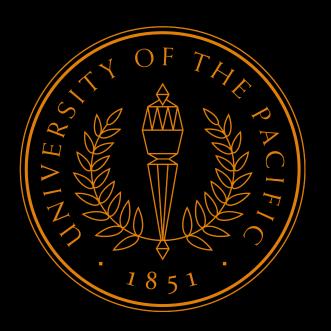


- #29 previously treated with symptomatic apical periodontitis.
- Possible reason for failure impossible to instrument isthmus in C-shaped canal.
- Close proximity to mental foramen.
- But most importantly...

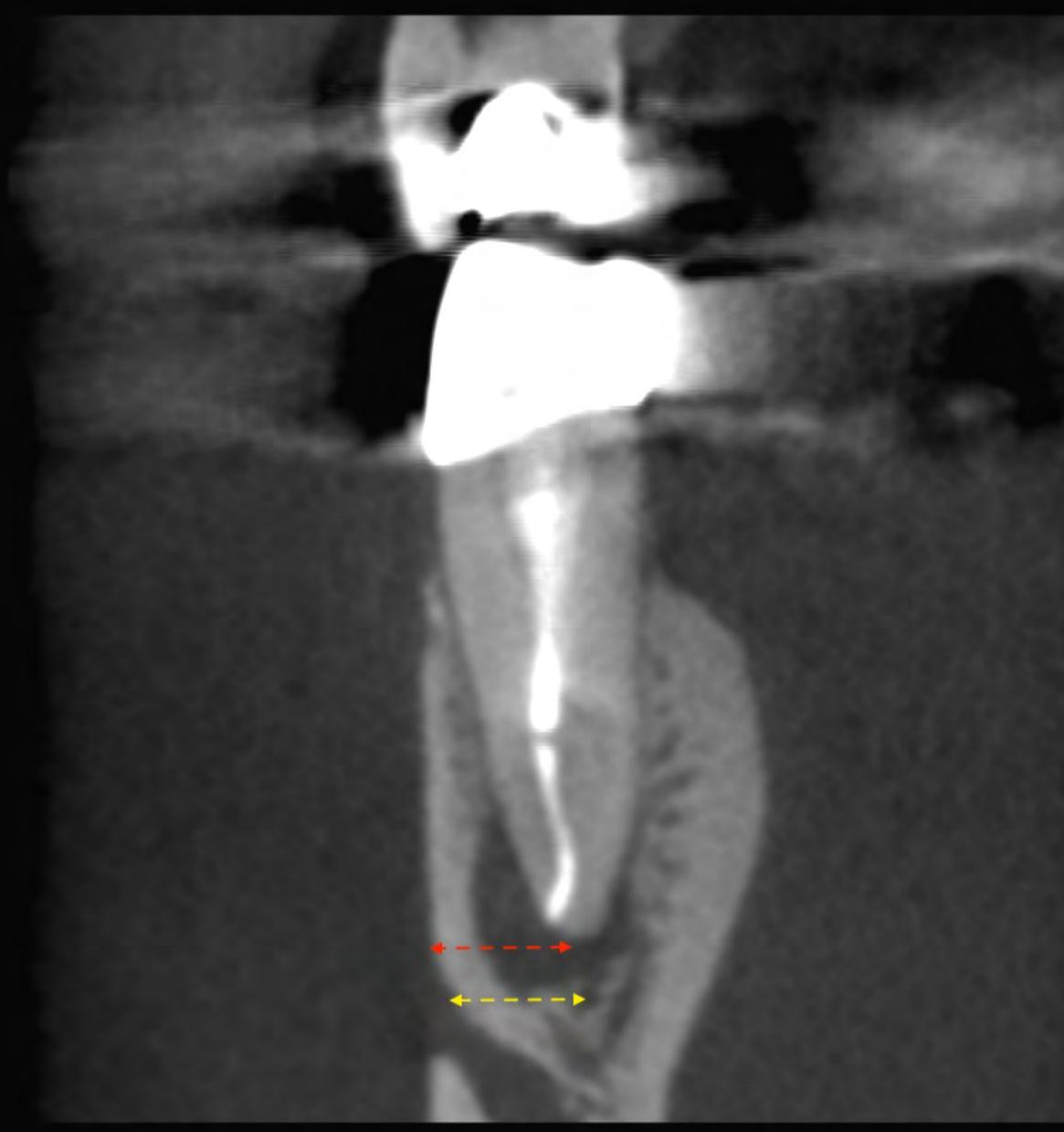








- Red level of anatomic apex corresponding to edge of mental foramen.
- Yellow level at which traditional osteotomy would extend.

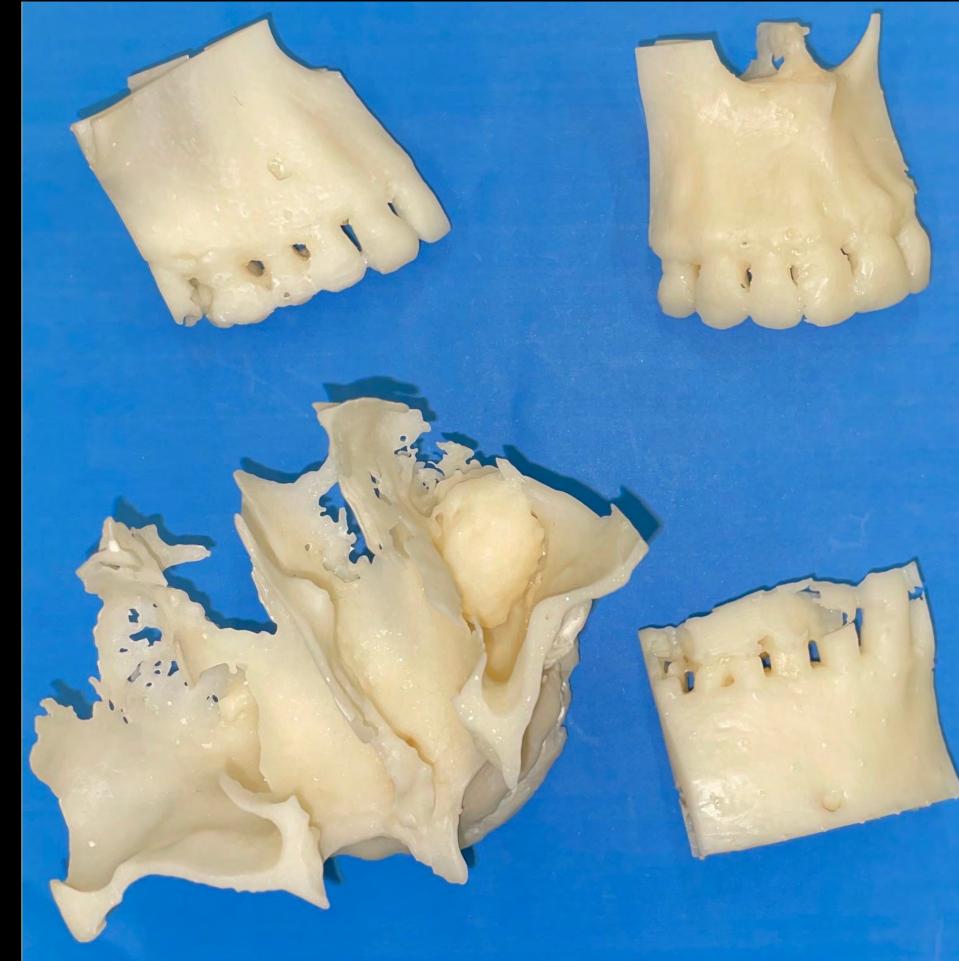






3 Printing to the rescue!

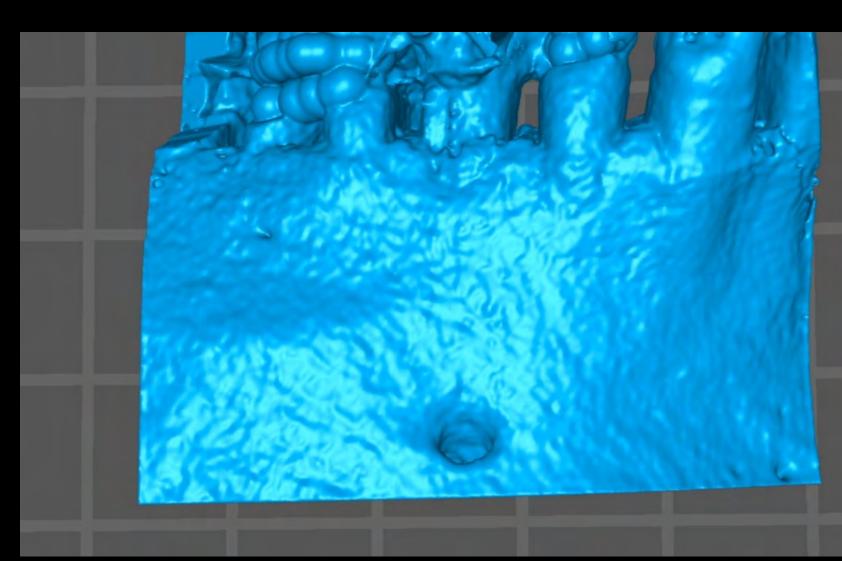
- Methodology and application ideas conceptualized and developed by the presenter.
- Several microendodontic surgical procedures already performed with the aid of 3D printed models at UOP Postgrad Endo.
- Unique to UOP.
- Subject of ongoing research in the Department of Endodontics.

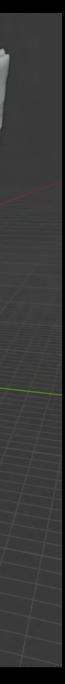




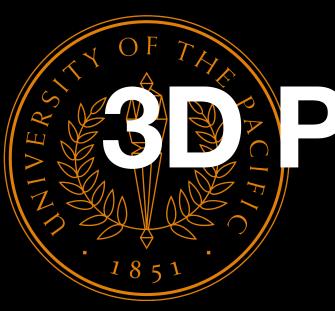


- Converted CBCT DICOM files to 3D printable ".stl" files.
- 3D printed the model.
- Created a suck-down stent on the model.
- Marked the mental foramen and retraction grooves.







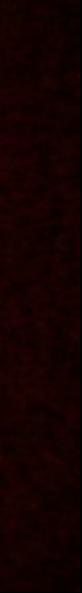


Brinting to the rescue!

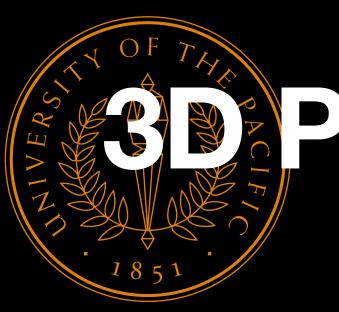
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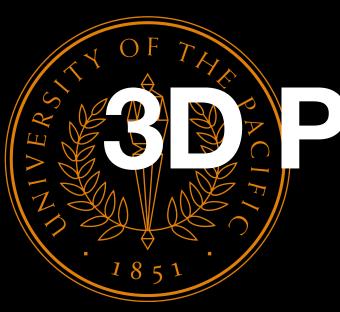




30 Printing to the rescue!

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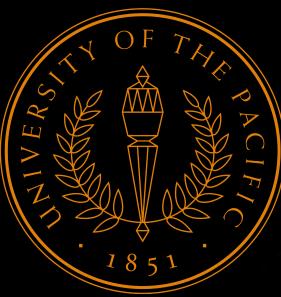


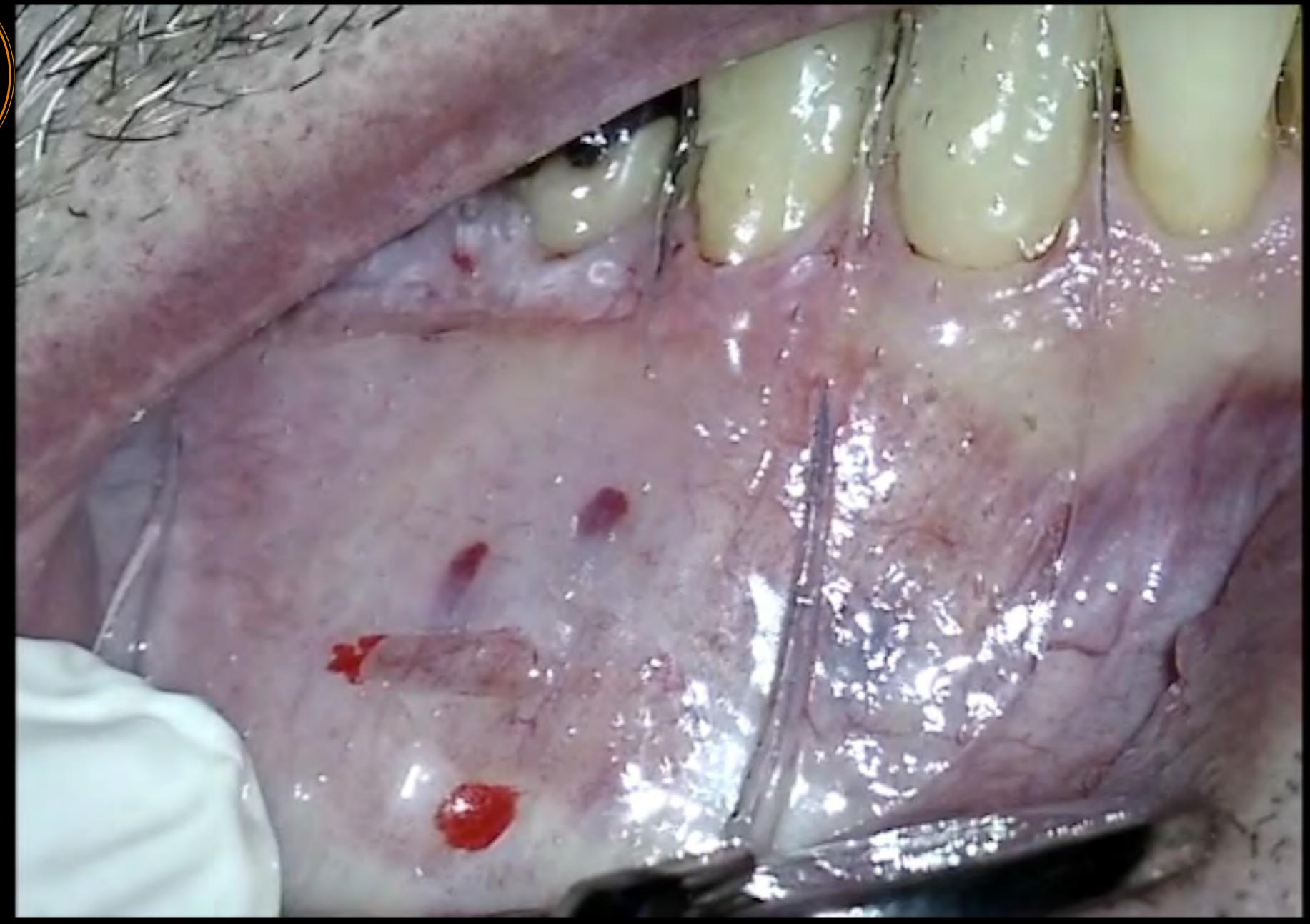


3D Printing to the rescue!

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No paresthesia!



Avoided complication - paresthesia!



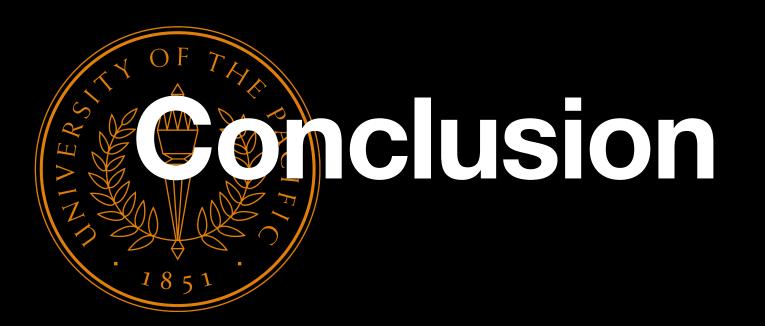
- Avoided complication paresthesia!
- Avoided complication iatrogenic errors.



- Avoided complication paresthesia!
- Avoided complication iatrogenic errors.
- Influenced efficiency stent acted as a guide.



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



abatement, during endodontic microsurgical procedures.

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-



Special thanks to Dr. Ralan Wong and Dr. Lucas Brand for their help in preparation for this presentation.

Thank you!

