SURGICAL REMOVAL OF A SEPARATED INSTRUMENT DURING APICOECTOMY

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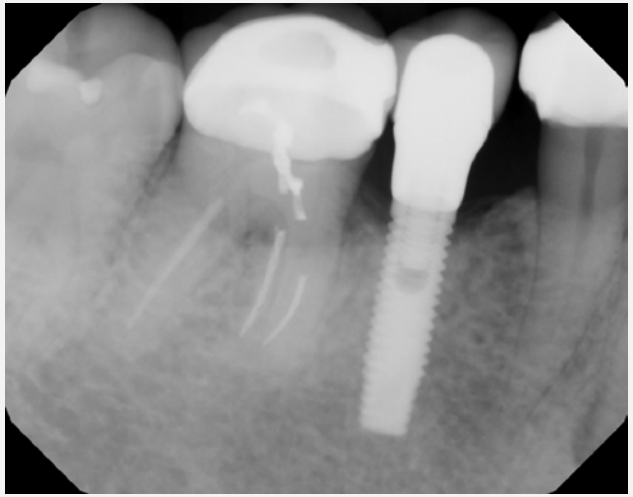
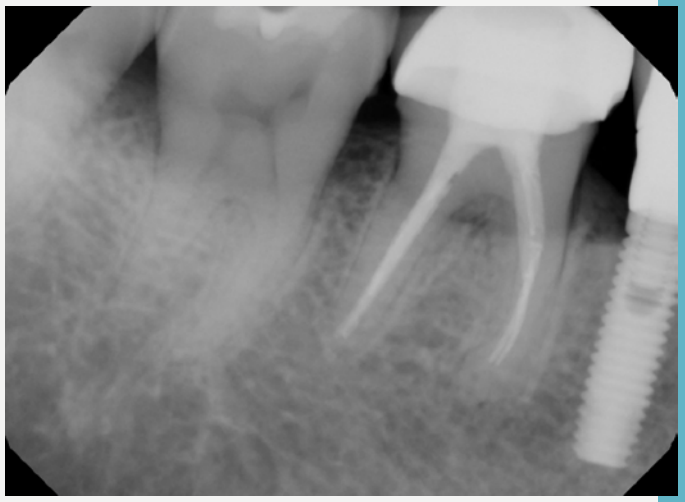
BACKGROUND INFORMATION ON SEPARATED INSTRUMENTS

- The incidence of separated instruments ranges from 0.4-23%, with Endodontists reporting around 5%. [1]
- Most fractures of instruments occur in the M roots of mandibular molars due to the inaccessibility and angulation.[2]
- The general consensus is that the separated instrument does not have a significant effect on outcome as long as there is not a pre-operative lesion[3,4]
- Orthograde removal involves a variety of methods including: extractors, wire loops, post removal systems, ultrasonics, and laser irradiation [1]

CLINICAL CASE



Pre-op PA 2015



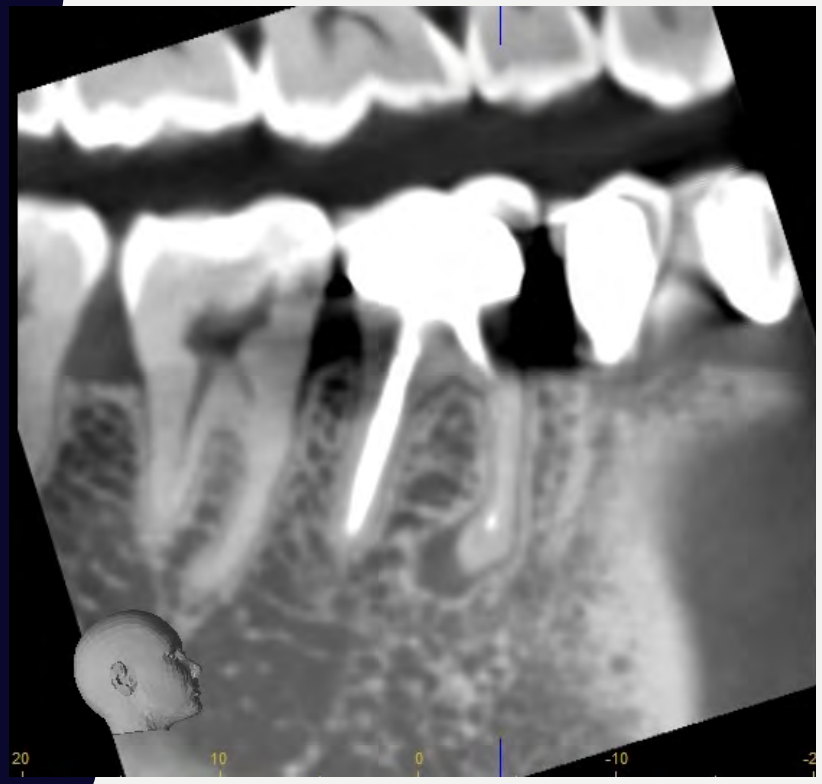
Re-treatment 2015

- 52 years old Female patient, ASA 1
- Presented for evaluation and treatment of tooth no 30.
  - Initial RCT was done ~ 10 years ago at an outside clinic where 2 rotary instruments were separated in the ML and MB canals.
  - #30 was re-treated in the residency clinic in 2015 but the files were unable to be bypassed or removed due to their size and location in the canal.
- Pt presented to the graduate endodontic clinic for evaluation of #30 due to presence of new PARL on M root.
  - Pt symptomatic to percussion at this time

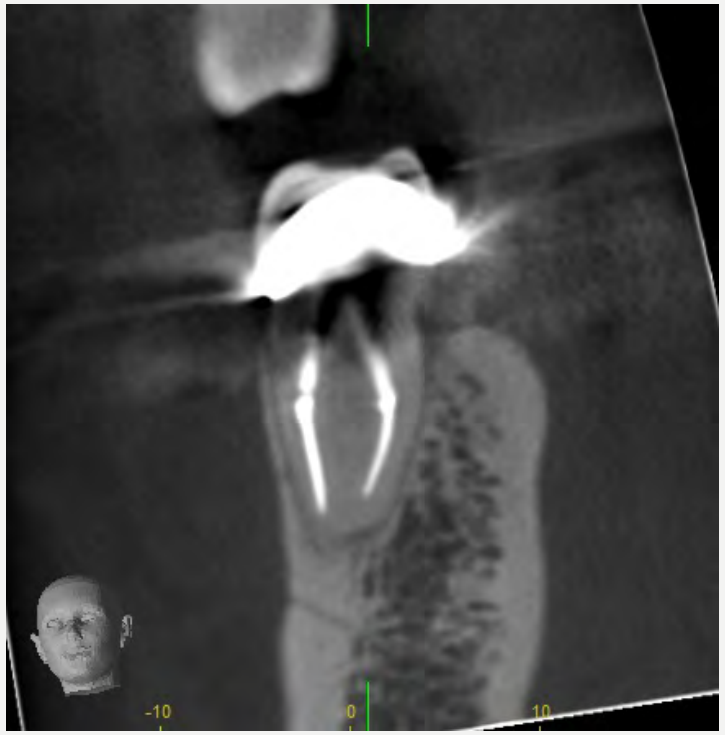
Pre-op PA 2022 showing separated rotary instruments in ML and MB canals

Pre-op BW

Pre-op Clinical photo



Sagittal slice showing lesion of low density on D aspect of M root



Coronal slice showing separated instruments in ML and MB canals

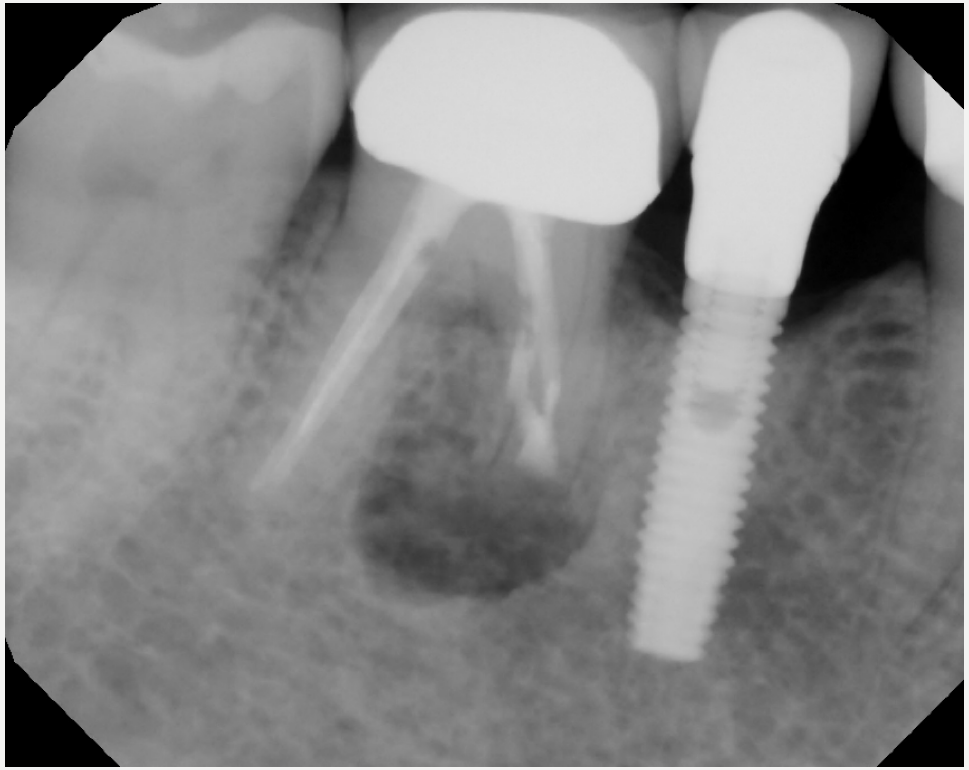
Axial slice showing isthmus between MB and ML canals

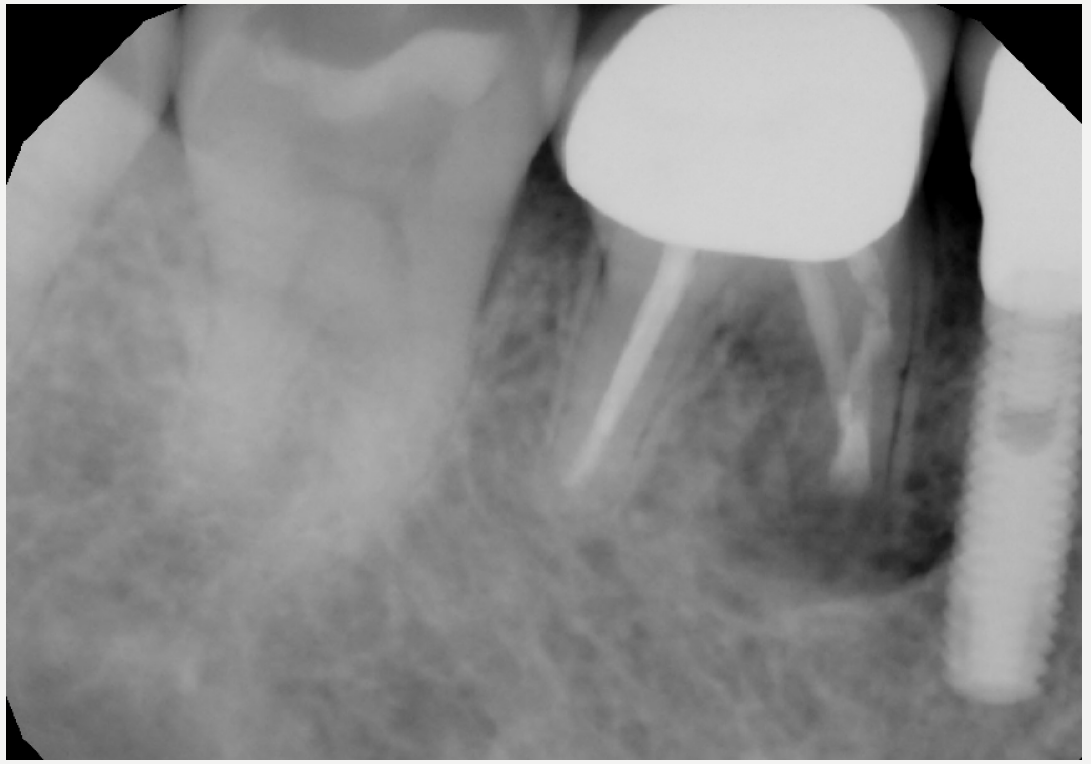
TREATMENT PLAN

- Decided to attempt surgery due to previous re-treatment that was unsuccessful in removing separated instruments
- Planned for papilla sparing full thickness flap with obtuse vertical releasing to avoid implant epithelial attachment
- 3mm resection of M root and attempt to remove separated instruments with ultrasonics
- BC putty retrofill
- No graft needed

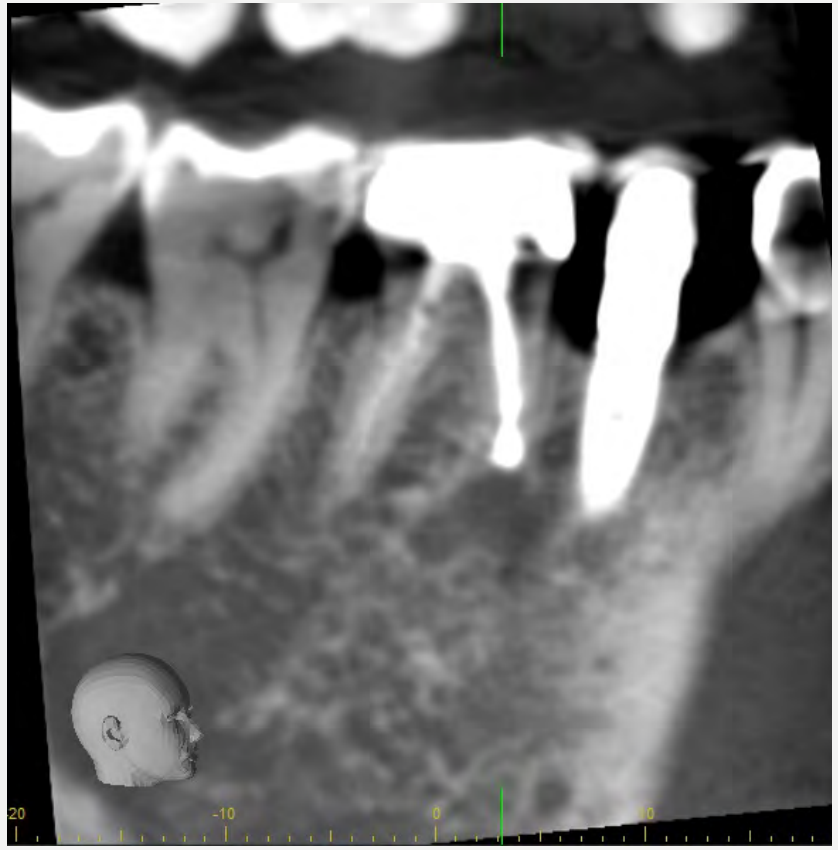
Instrument retrieved from MB canal

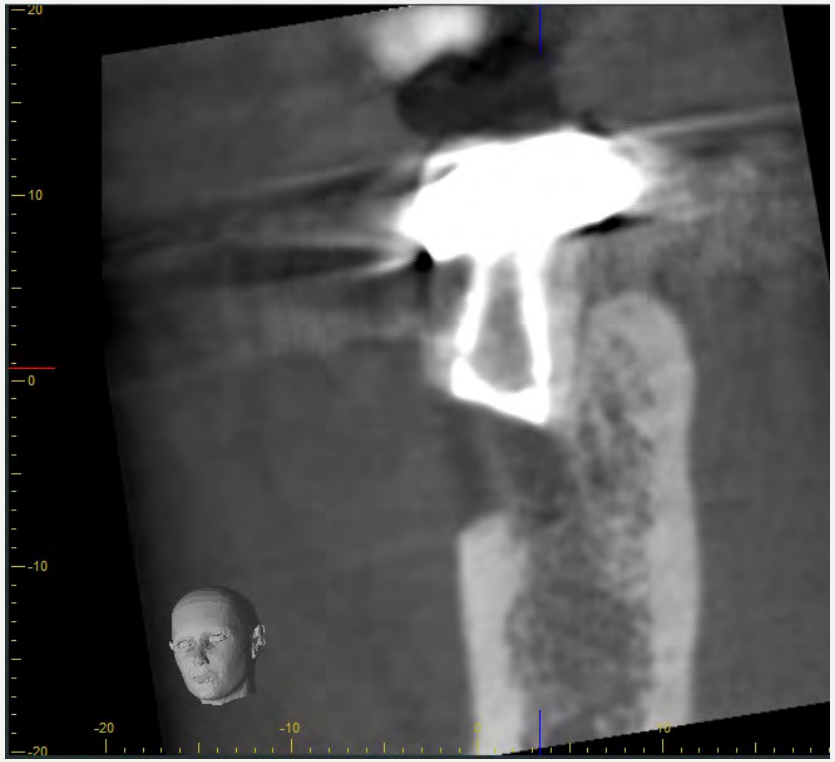
MB and ML instruments





Final PAs showing retrofill





Immediate post-op CBCTs showing osteotomy side and retrofill into isthmus

Immediate pre-op

1 month follow up

CONCLUSION

- When deciding between orthograde of retrograde instrument removal, consider the amount of tooth structure and retrievability of the separated instrument
- Surgical may be a better option especially if re-treatment was already attempted beforehand
  - More direct access to instruments after resection
  - No need to remove tooth structure internally
  - Alters environment of periapical region
- Present options to the patient and explain RBAs

REFERENCES

1. Hargreaves, K. M., & Berman, L. H. (2016). *Cohen's pathways of the pulp* (11th ed.). Elsevier.

2. J Cuje, C Bargholz, M Hulsmann: The outcome of retained instrument removal in a specialist practice. *Int Endod J.* 43:545 2010

3. MC Crump, E Natkin: Relationship of broken root canal instruments to endodontic case prognosis: a clinical investigation. *J Am Dent Assoc.* 80:1341 1970

4. P Spili, P Parashos, HH Messer: The impact of instrument fracture on outcome of endodontic treatment. *J Endod.* 31:845 2005

THANK YOU!

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Project Title: Surgical removal of a separated instrument during apicoectomy

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The aim of this presentation is to demonstrate the surgical removal of separated instruments via apicoectomy and retrograde fill. This treatment option is one to consider especially when previous orthograde removal has already been attempted. Thanks to Dr. Adham Azim for supervising and planning this procedure.

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