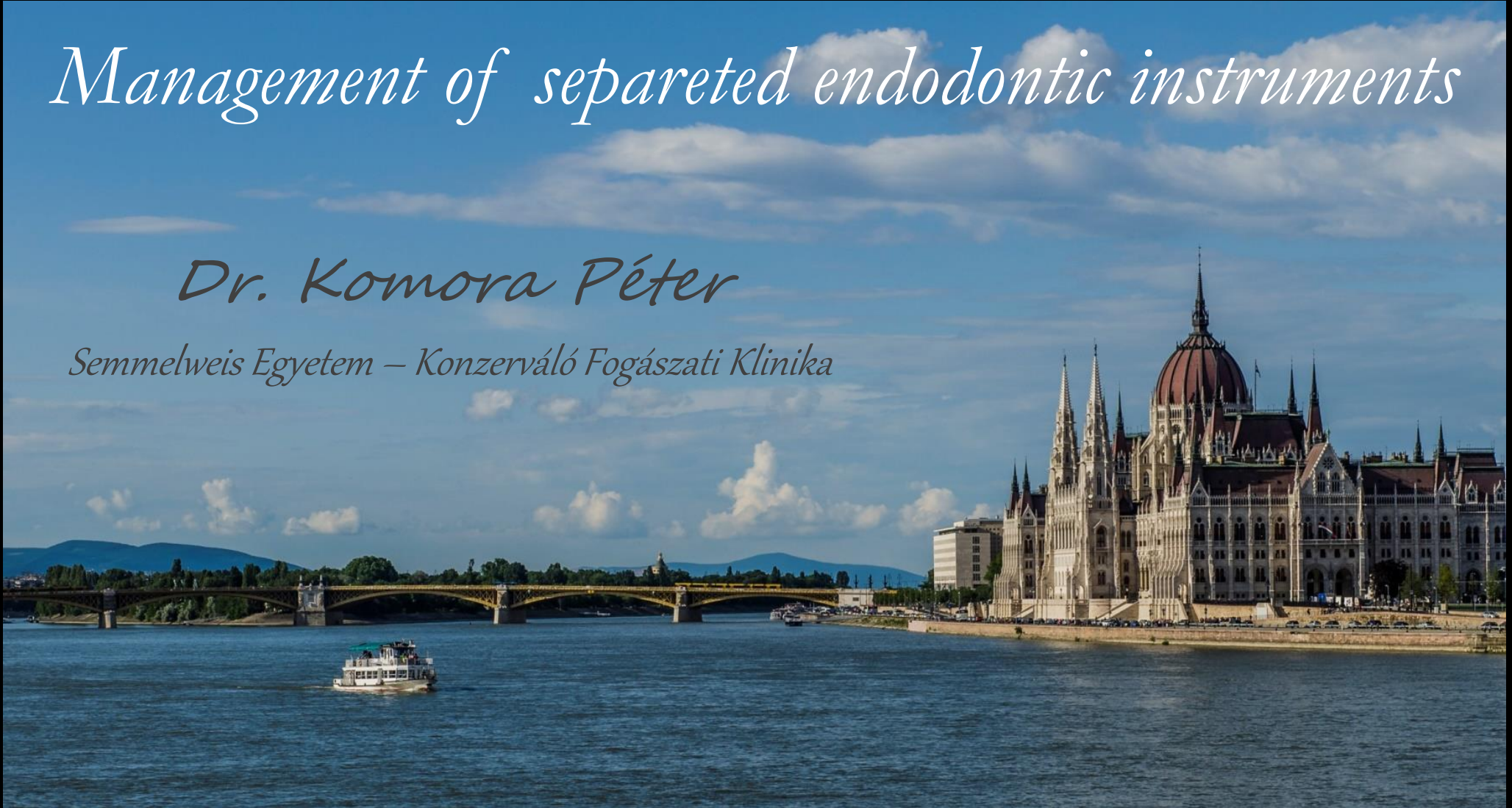




# *Management of separated endodontic instruments*

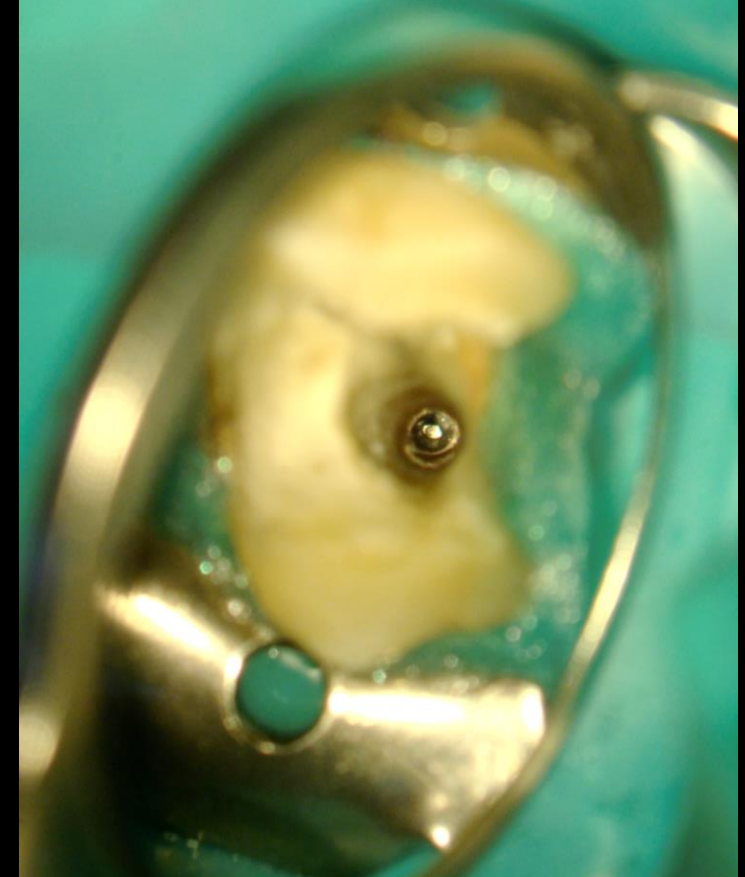
*Dr. Komora Péter*

*Semmelweis Egyetem – Konzerváló Fogászati Klinika*



# Introduction

- It can have an effect on the success of root canal treatment
- Prevents/hinder chemo-mechanical preparation
- For manual files (stainless steel)
  - 0.25% to 6%
- Machine driven instruments (NiTi)
  - 1.3% -10%



## Management of Intracanal Separated Instruments

*Abmad A. Madarati, PhD, MSc, BDS,<sup>\*†</sup> Mark J. Hunter, MSc, BDS,<sup>‡</sup>  
and Paul M.H. Dummer, PhD, MSc, BDS<sup>¶</sup>*

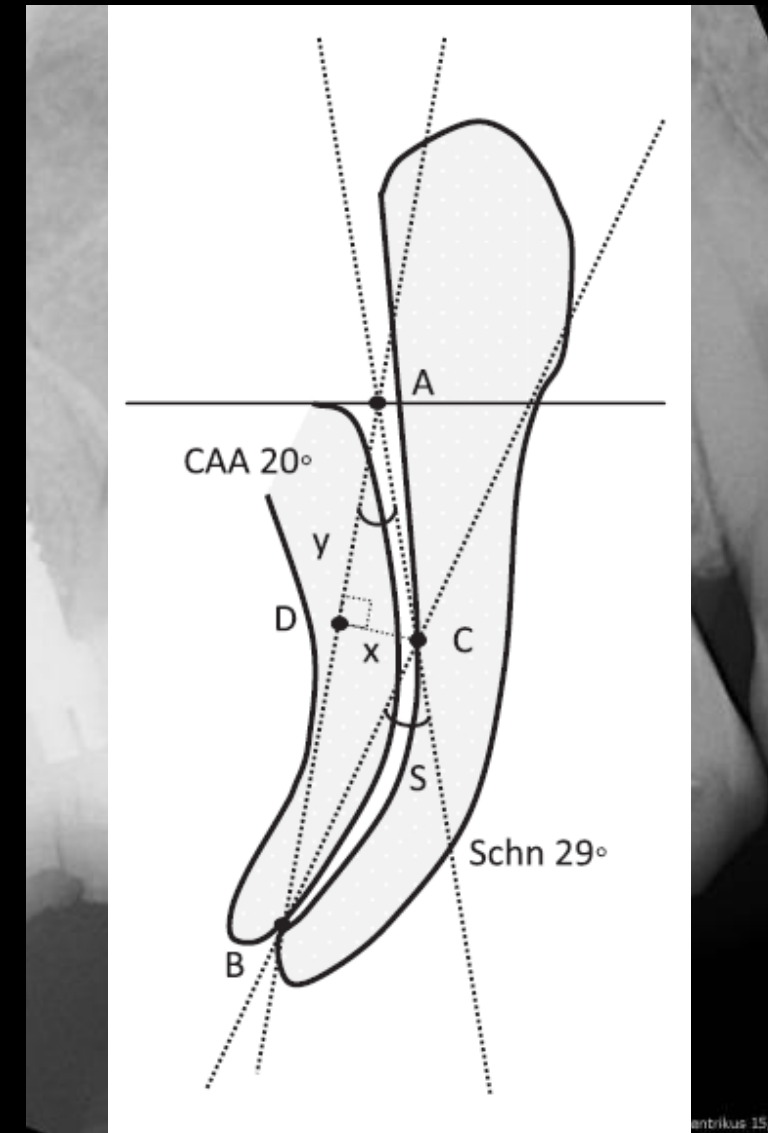
JOE — Volume 39, Number 5, May 2013

# *Factors Influencing Removal of Separated Instruments*

- Tooth Factors
- Separated Instrument Factors (Type, Design, and Length)
- Operator Factors
- Patient Factors

## Tooth Factors

- Type of tooth front-premolar-molar
- The fragment's position in the root canal
  - Coronal, middle, apical
- The separated instrument–canal wall interface
  - How many space between the instrument and the canal wall
- Initial diagnosis
  - Pulpitis
  - Periapical lesion
- Tooth anatomy
  - CAA canal access angle  $>20^\circ$
  - Schneider angle  $>40^\circ$





## Separated Instrument Factors (Type, Design, and Length)

- Type (material)
  - Stainless Steel
  - NiTi
- Design
  - Cutting edge
    - K-file
    - Hedström
  - Non-cutting edge
    - Lentulo
    - Spreader
- Length of the fragment

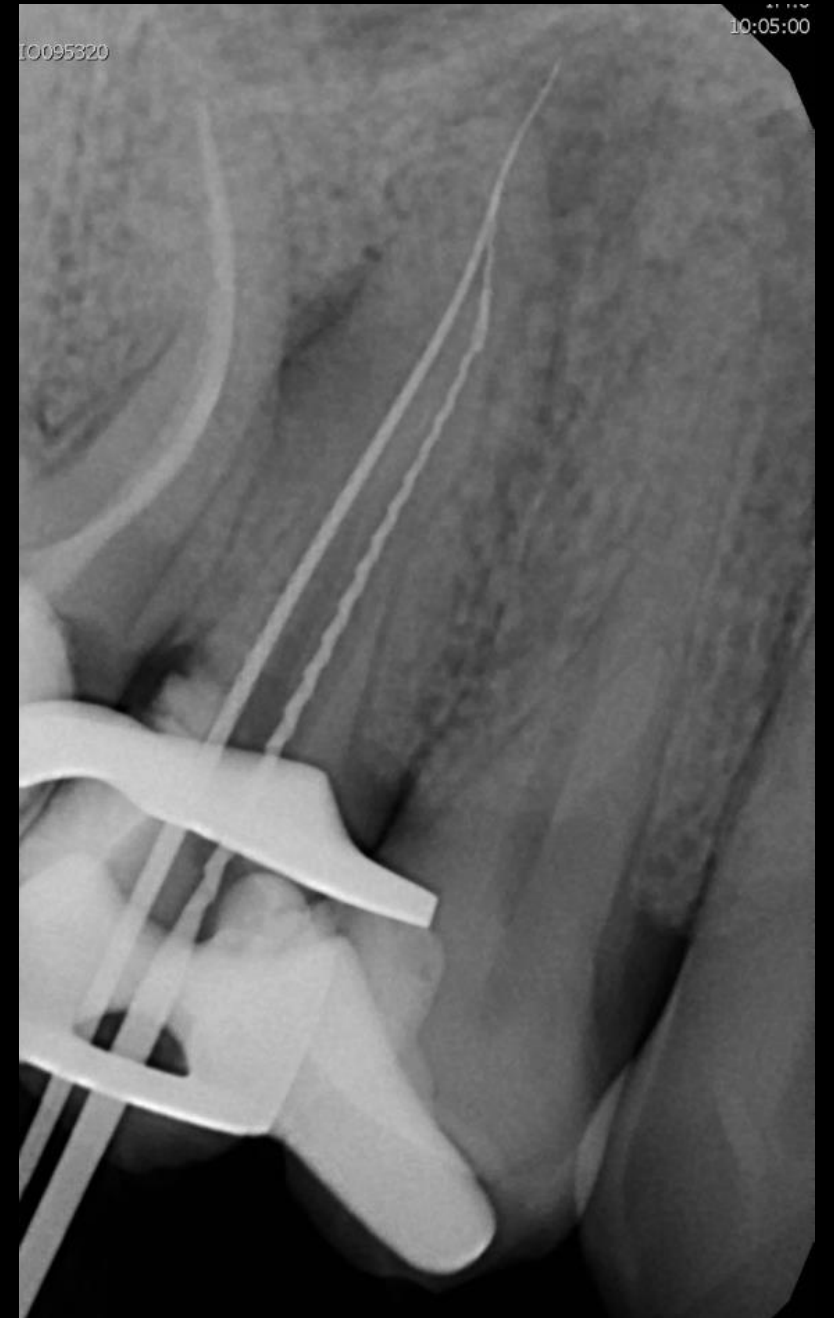


- Operator Factors
  - Competence
  - Instruments
  - Strategy
  - Knowledge
- Patient Factors



# *Treatment options*

- Orthograde treatments
  - Bypass
  - Attempt to remove
    - Calculate tooth structure loss
  - Leave the fragment in canal
    - Clean and fill to fragment level
- Surgical Management
  - Apical surgery (root end resection), hemisection, intentional replantation, root amputation
  - Apical surgery - retrograde filling



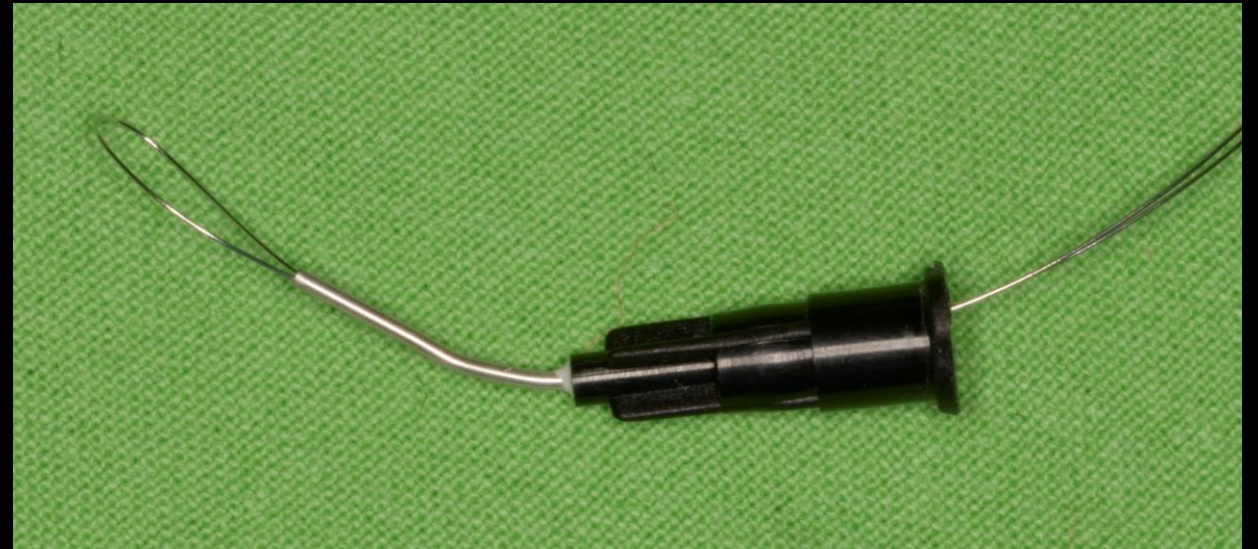
# Techniques Used for Removing the Separated Instrument

- Chemical Solvents
  - hydrochloric acid, sulfuric acid– corrosion
  - Don't recommended
- Mini Forceps
  - Stieglitz forceps
  - Peet – silver cone
- Barbed Broach and cotton
- Heated guttapercha cone





- Wire loop

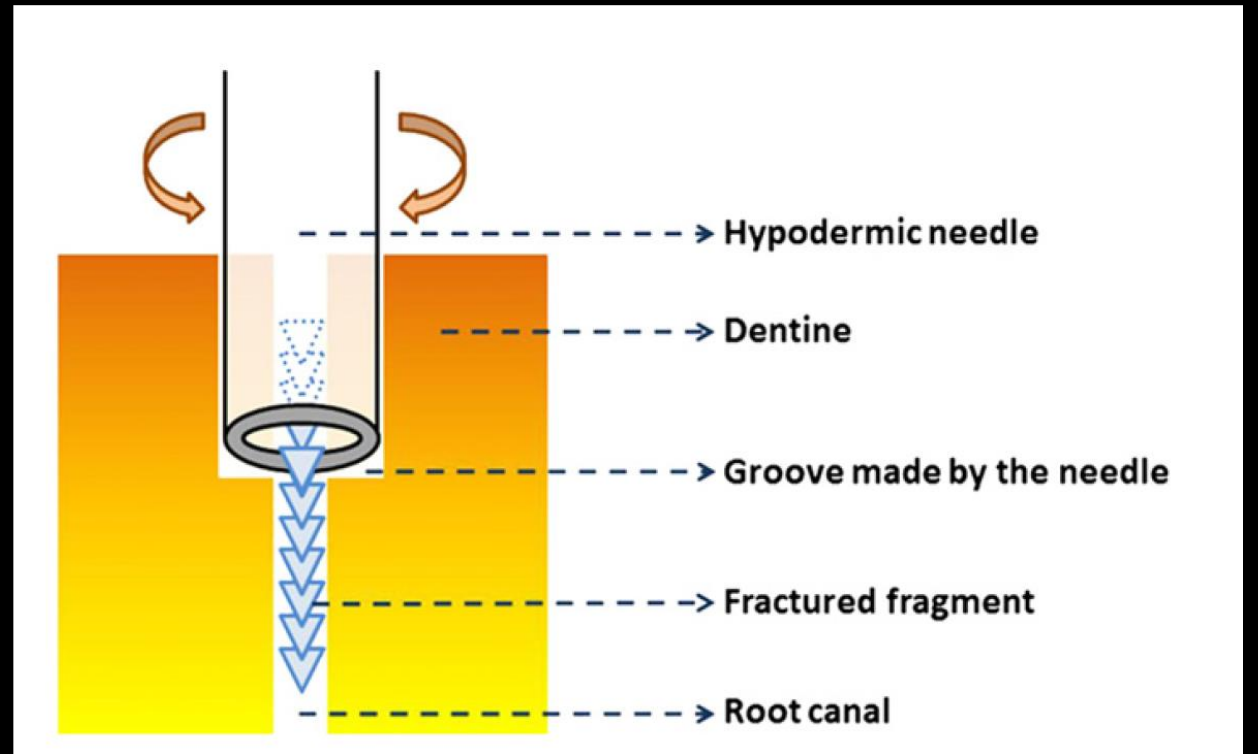


- Hypodermiás tű

- Ragasztó anyag
- Cement alkalmazása

- Kézi műszerek alkalmazása

- „Körülfonás”





- Ultrasonic

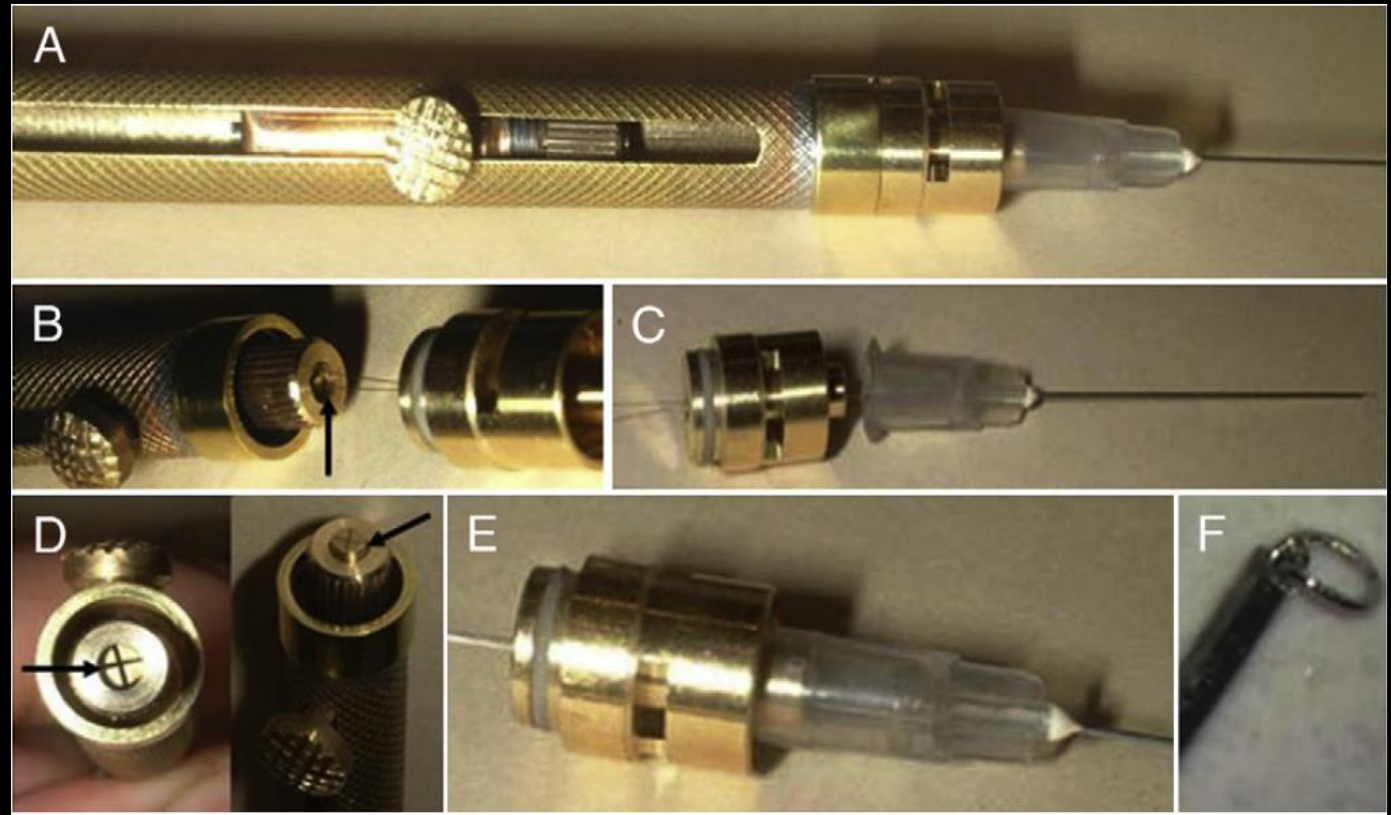




- File removal system



BTR-pen (Broken tool removal)



### Endodontic micro forceps

The working part has three movable and serrated jaws at the tip for extremely strong and firm seizing of a broken instrument inside the root canal in any configuration – the broken instrument is positioned centrally between the serrated edges of the three jaws, or laterally in the slit between any two jaws.



[www.cerkamed.com](http://www.cerkamed.com)

(Courtesy of Dr Yoshitsugu Terauchi.)



Rtg. excentrikus 15,



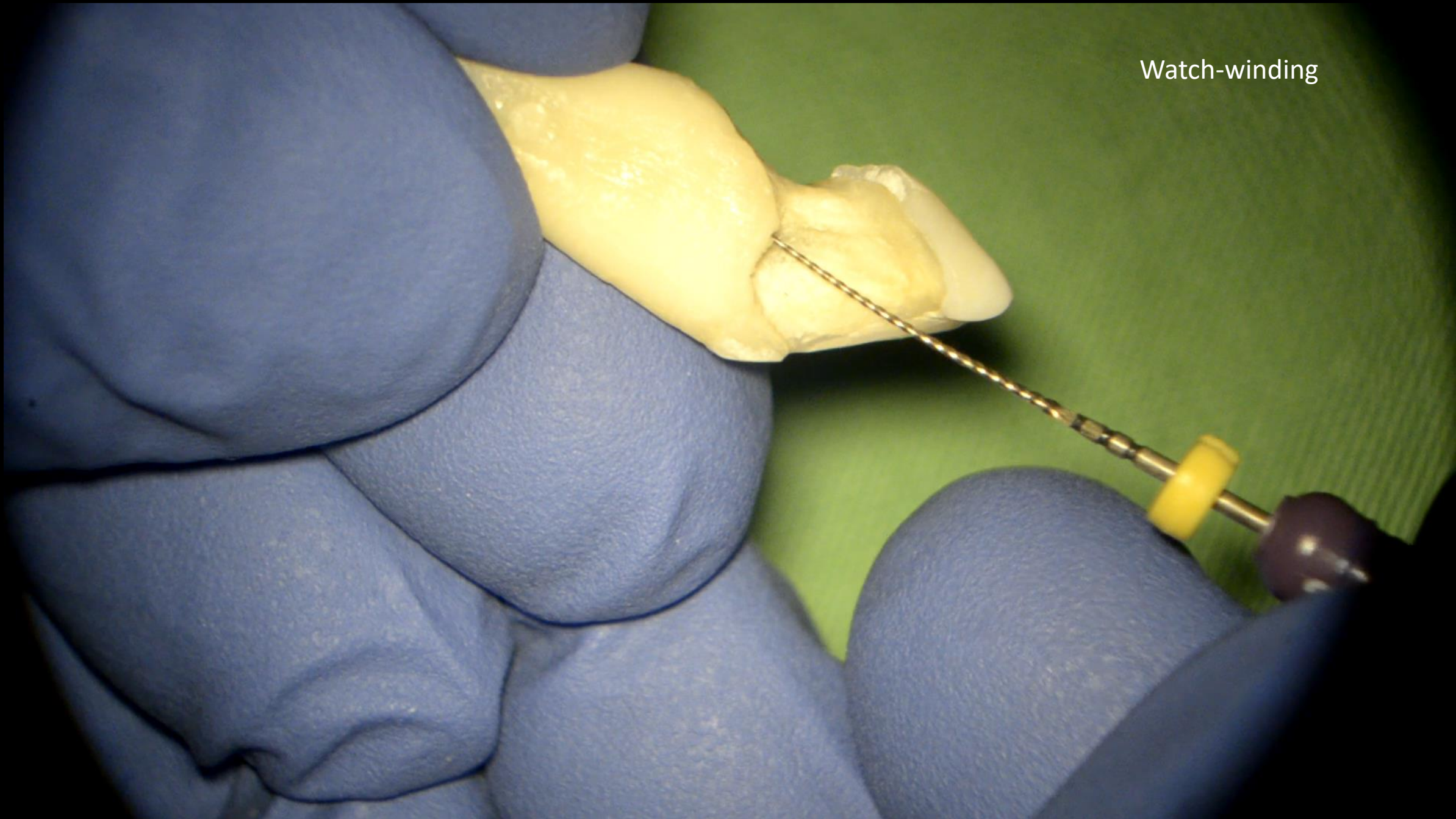
14 bypass



Rtg Periapikal

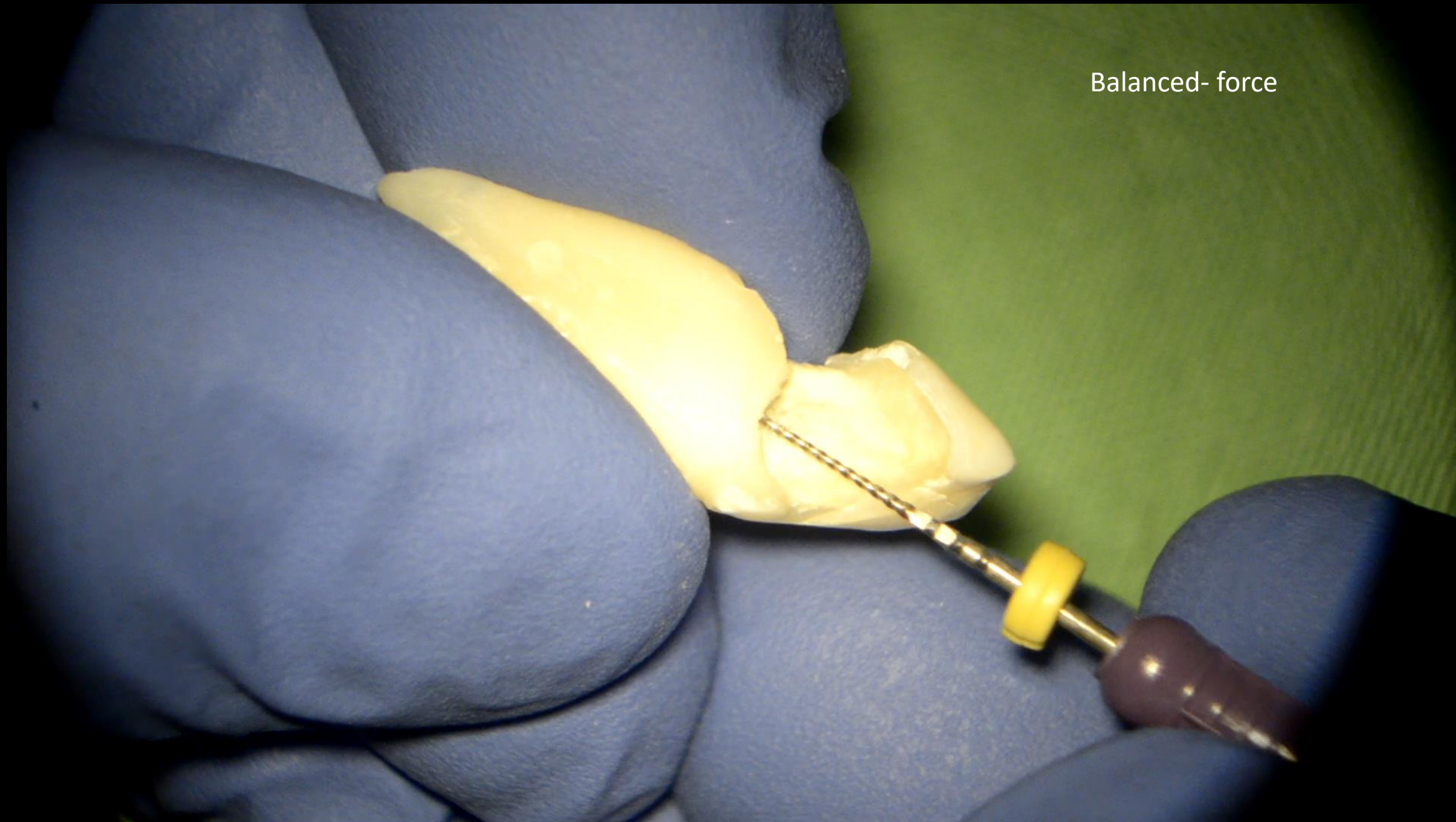


Watch-winding





Balanced- force



# *46 fog radix entomolaris*

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*Egyetemi Tanársegéd*





# JBR Journal of Interdisciplinary Medicine and Dental Science

Parashar A, et al., J Interdiscipl Med Dent Sci 2015, 3:1  
DOI: [10.4172/2376-032X.1000161](https://doi.org/10.4172/2376-032X.1000161)

Research Article

Open Access

## The Radix Entomolaris and Paramolaris: A Review and Case Reports with Clinical Implications

Amit Parashar<sup>1\*</sup>, Shikha Gupta<sup>2</sup>, Abhishek Zingade<sup>1</sup> and Shashi Parashar<sup>3</sup>

# Radix Entomolaris (additional root located lingually)

**Classification:** Carlsen & Alexandersen (1990) classified radix entomolaris (RE) into four different types based on the location of its cervical part [6]:

1. Type A: the RE is located lingually to the distal root complex which has two cone-shaped macrostructures.
2. Type B: the RE is located lingually to the distal root complex which has one cone-shaped macrostructures.
3. Type C: the RE is located lingually to the mesial root complex.
4. Type AC: the RE is located lingually between the mesial and distal root complexes.



De Moor et al. (2004) classified radix entomolaris based on the curvature of the root or root canal [11]:

1. Type 1: a straight root or root canal.
2. Type 2: a curved coronal third which becomes straighter in the middle and apical third.
3. Type 3: an initial curve in the coronal third with a second buccally oriented curve which begins in the middle or apical third.

Song JS et al. (2010) further added two more newly defined variants of RE [21]:

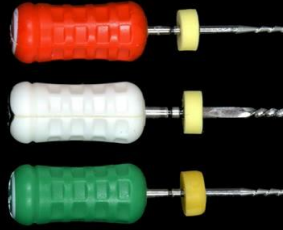
1. Small type: length shorter than half of the length of the distobuccal root.
2. Conical type: smaller than the small type and having no root canal within it.



## **Radix paramolaris (additional root located buccally)**

**Classification:** Carlsen & Alexandersen (1991) classified radix paramolaris (RP) into two different types [29]:

1. Type A: cervical part is located on the mesial root complex.
2. Type B: cervical part is located centrally, between the mesial and distal root complexes.



# *24 retreatment with complicated anatomy*

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*Egyetemi Tanársegéd*



- Referred patient
- 10 years prior root canal filling
- Periodontitis apicalis chronica acute flare

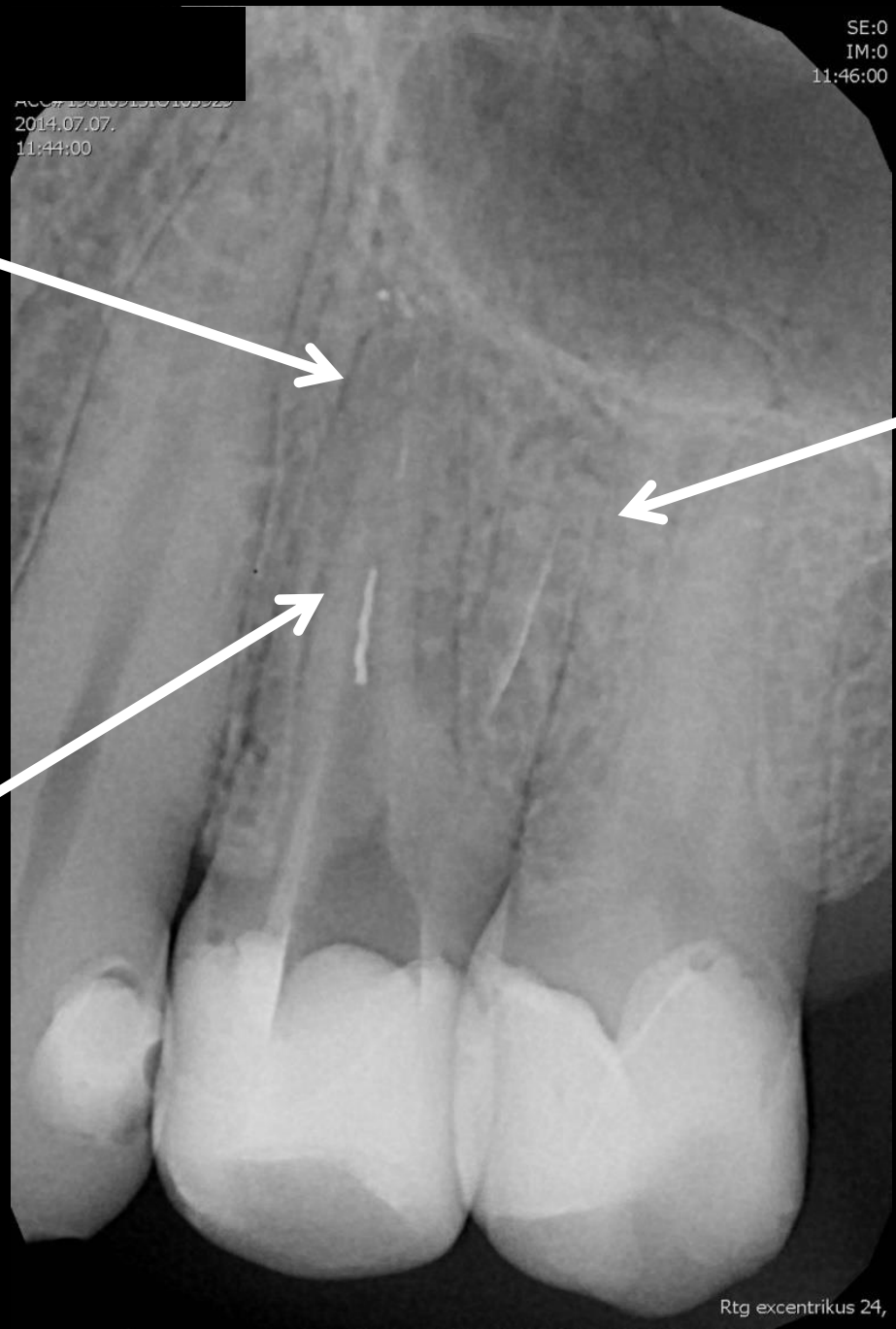
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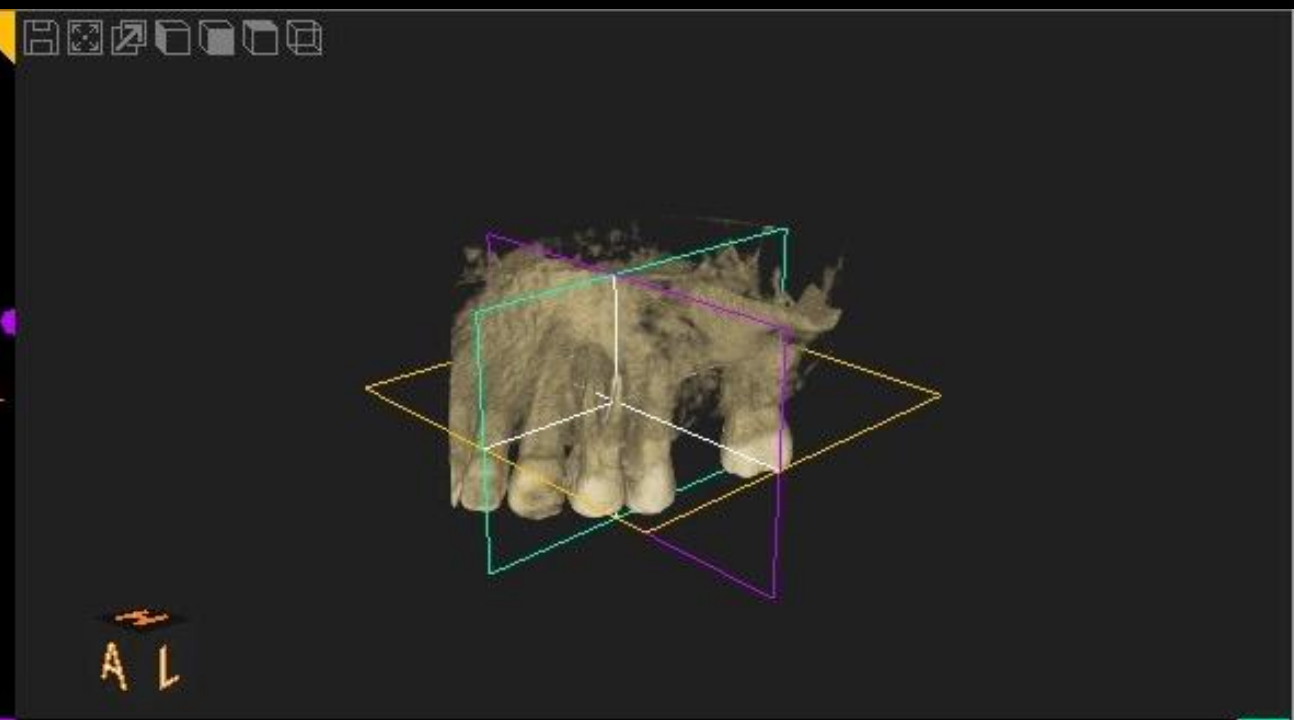
Palatinal root

Distobuccal root

Mesiobuccal root



Rtg excentrikus 24,

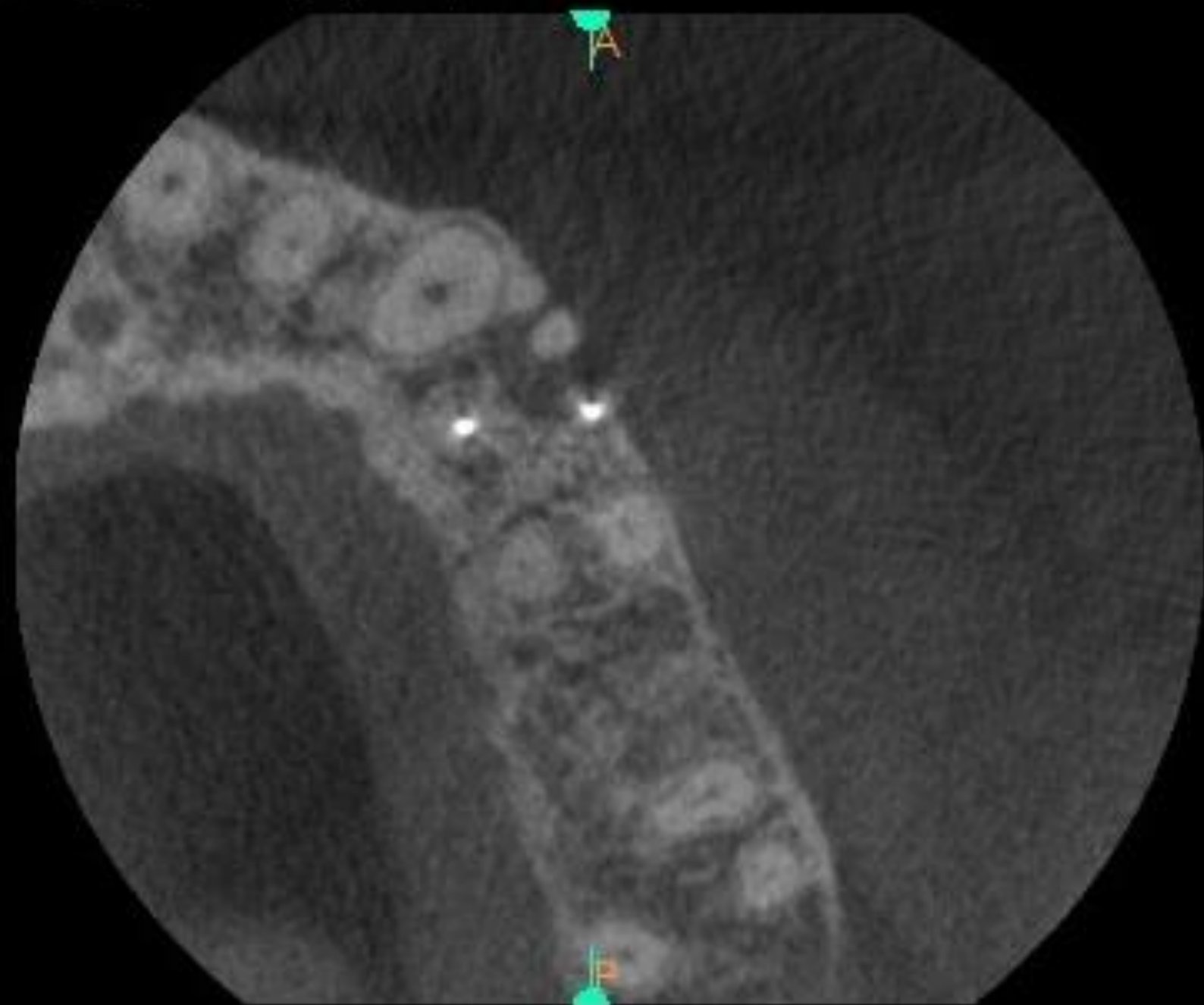


1x1



76  $\mu$ m

7.37 mm



L

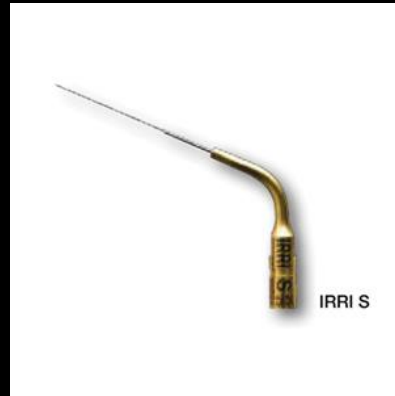
oom: 0.55



## *Treatment plan*

- Instrument fragment remove
- Cleaning and shaping of mesiobuccal root canal
- Obturation

*Strategy*





# *Loop technique tooth 46*

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*Egyetemi Tanársegéd*

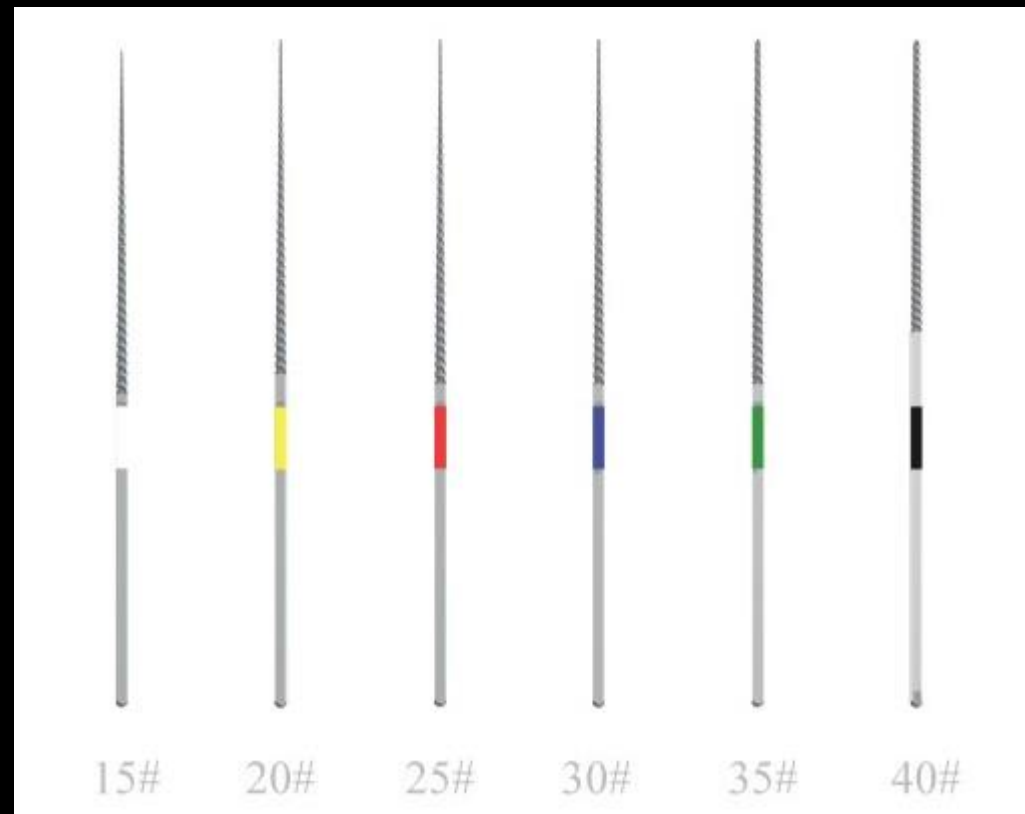






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- Tooth 46
- Reciproc R25
- Referred case



# *Tooth 46 separated file removal and obturation*

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*Egyetemi Tanársegéd*



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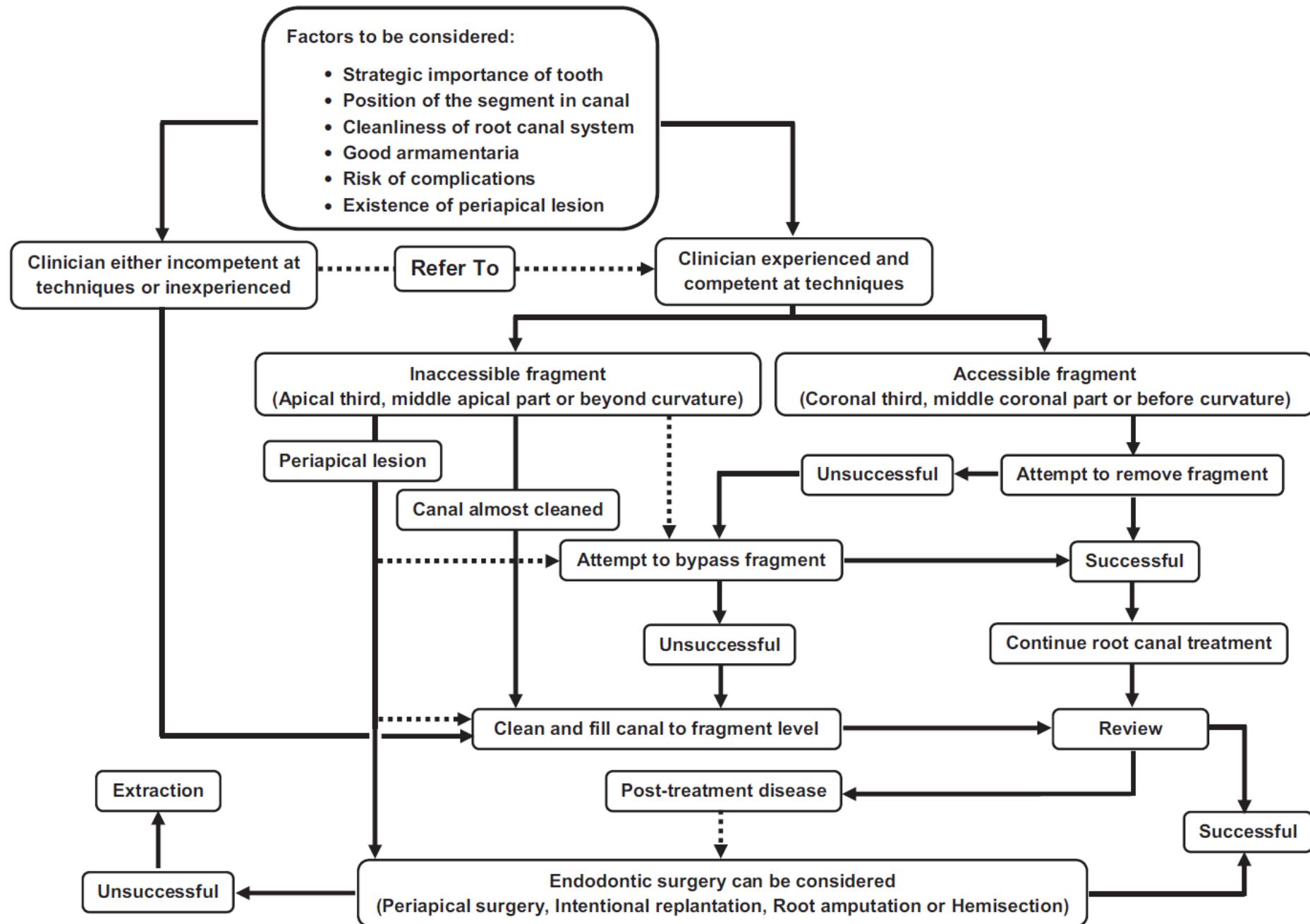
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Rtg Periapikális 36,





*Conclusion*

*Thank you for your kind  
attention!*

*[komorapeter@gmail.com](mailto:komorapeter@gmail.com)*

