

Retreat or not retreat ?

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1

International Endodontic Journal

A prospective study of the factors affecting outcomes of nonsurgical root canal treatment: part 1: periapical health

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PRIMARY TREATMENTS
82,8% - 89,1%

NG, Y.-L. ET AL. INT ENDO J. 2011 JUL;44(7):583-609.

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2

Prevalence of apical periodontitis relative to endodontic treatment in an adult Dutch population: a repeated cross-sectional study

Linda B. Peters, DDS, PhD,¹ Jeroen A. Lindheem, DDS, MD, PhD,² Marika E. Ehn, DDS,³ and Paul R. Wouda, DDS, PhD,⁴ Amsterdam, the Netherlands
¹ACTA Academic Centre for Dentistry Amsterdam, ²ACTA Academic Centre for Dentistry Amsterdam, ³ACTA Academic Centre for Dentistry Amsterdam, ⁴ACTA Academic Centre for Dentistry Amsterdam

Objective: We aimed to compare an Amsterdam subpopulation's current prevalence of root canal fillings and associated periapical radiolucencies with a similar patient sample from 1988.

Study design: An Amsterdam subpopulation was evaluated for missing teeth, restorations, quality of endodontic treatment, and periapical radiolucencies.

Results: A total of 119 radiographs were evaluated and 4384 teeth were examined. Of these, 324 (7%) exhibited widening of the apical periodontal ligament or periapical radiolucency and 234 (4.4%) had been endodontically treated. A total of 119 teeth (2.7%) had radiographic signs of apical periodontitis. Of these lesions, 14 (4.7%) were listed to endodontically treated teeth (24.1% of endodontically treated teeth). Inadequate root canal fillings were frequent (25.8%). Apical radiolucency was significantly higher in these teeth than in adequately root-filled teeth.

Conclusion: Findings indicate that the prevalence of apical periodontitis in an Amsterdam subpopulation has not improved over almost 2 decades. (*J Oral Maxillofac Pathol Oral Radiol Endod* 2011;13:523-530).

24% of the endodontically treated teeth were associated with a periapical lesion

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35% of the root-filled teeth had AP

34% of the root-filled teeth had AP

34% of the root-filled teeth had AP

41% of the root-filled teeth had AP

52% of the root-filled teeth had AP

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International Endodontic Journal

The global prevalence of apical periodontitis: a systematic review and meta-analysis

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93 STUDIES INCLUDED
about root filled teeth
39% are associated with a lesion

TIBURCIO-MACHADO, G. S. ET AL. INT ENDO J. 2021 MAY;54(5):712-735.

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•How to explain the discrepancy ?

- Cross sectional vs. Outcome study with follow-up
- Do outcome studies correctly reflect the situation?
- How long ago was the treatment done ?
- Healing of the lesion but not (yet) full recovery
- Apical scar tissue
- Quality of the treatment

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LAUKKANEN ET AL. ACTA ODONTOL SCAND. 2021

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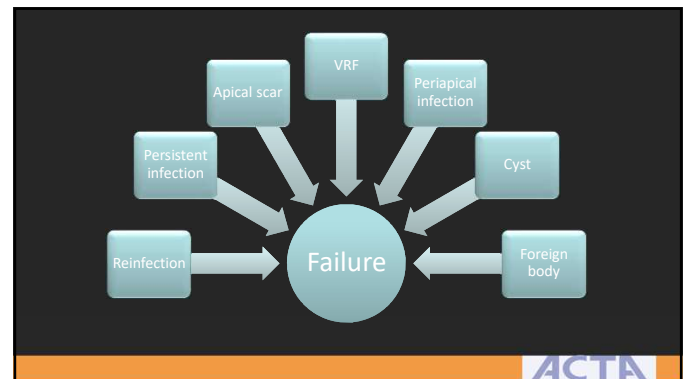
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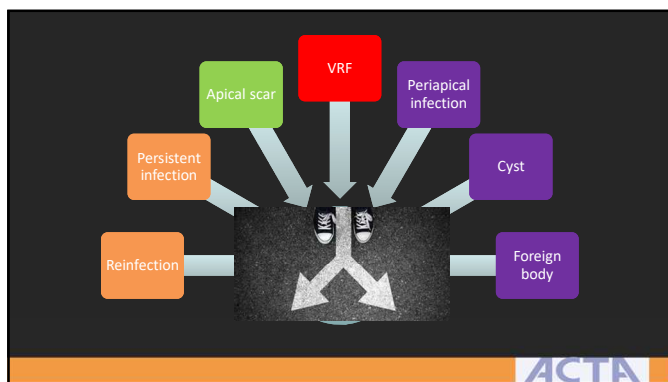
Why do root canal treatments fail?

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7



8



9

How to manage failure of a root canal treatment?

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- Monitor
- Retreatment
- Surgical endodontics
- Combination
- Extraction

Reit C, Gröndahl HG. Swed Dent J. 1984;8(1):1-7.

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How to manage failure of a root canal treatment?

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Reit C, Gröndahl HG. Swed Dent J. 1984;8(1):1-7.

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● Monitor

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- When there are no complaints (of symptoms...?)
- When the treatment was recently (<4 years?)
- When we see no difference compared to older radiographs

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12

● Monitor

- When there is no clear diagnosis
- When there is no restorative plan
- When there are no systemic risks

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2009 2012 2015 2021

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2012 2015 2017 2023

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15

2012 2014 2016 2018 2019

Wesley The, ACTA

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16

● Monitor

28,5% UNCHANGED 51,5% WORSE 20% Improved

TSESIS I. ET AL. J ENDD. 2013 DEC;39(12):1510-5.

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17

● Monitor

Adequate coronal restoration Inadequate coronal restoration Adequate root canal filling Inadequate root canal filling

Worsen (PAI score increased)
Improved (PAI score decreased)
Unchanged (PAI score remain the same)

TSESIS I. ET AL. J ENDD. 2013 DEC;39(12):1510-5.

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● Monitor- recommendations

- Set baseline !
- Clinical checkups + radiographs
- Old radiographs ?
- Inform the patient, also risks of flareups
- Monitoring a BAD root canal treatment ↓↓↓
- Systemic implications ±

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19

How to manage failure of a root canal treatment?

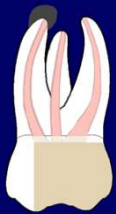
- Monitor
- Retreatment
- Surgical endodontics
- Combination
- Extraction

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20

● RETREATMENT



SUCCESS RATE
78,04% - 86,38%

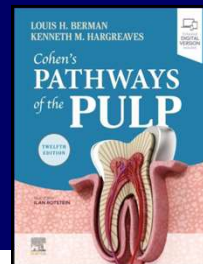
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SABETI, M. ET AL. J ENDO. 2024 APR;50(4):414-433.

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21

● RETREATMENT



NONSURGICAL ENDODONTIC RETREATMENT

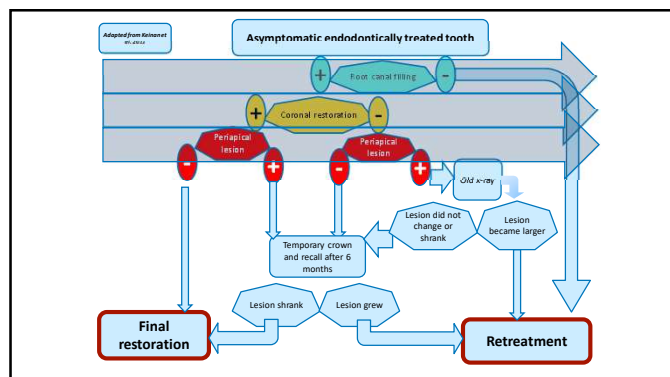
The primary difference between nonsurgical management of primary endodontic disease and that of posttreatment disease is the need to regain access to the apical area of the root canal space in the previously treated tooth. After that, all of the principles of endodontic therapy apply to the completion of the retreatment case. Coronal access needs to be completed, all previous root-filling materials need to be removed, canal obstructions must be managed, and impediments to achieving full working length must be overcome. Only then can cleaning

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COHEN'S PATHWAYS OF THE PULP (12TH ED.). ST. LOUIS, MO

22



23

How to manage failure of a root canal treatment?

- Monitor
- Retreatment
- Surgical endodontics
- Combination
- Extraction

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Reit C, Gröndahl HG. Swed Dent J. 1984;8(1):1-7.

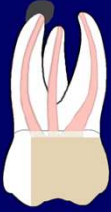
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24

Surgical endodontics

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SUCCESS RATE
78.4 - 91.3%



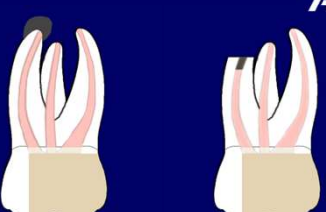
PINTO D, MARQUES A, PEREIRA JF, PALMA PJ, SANTOS JM. MEDICINA (KAUNAS). 2020 SEP 3;56(9):447

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Surgical endodontics

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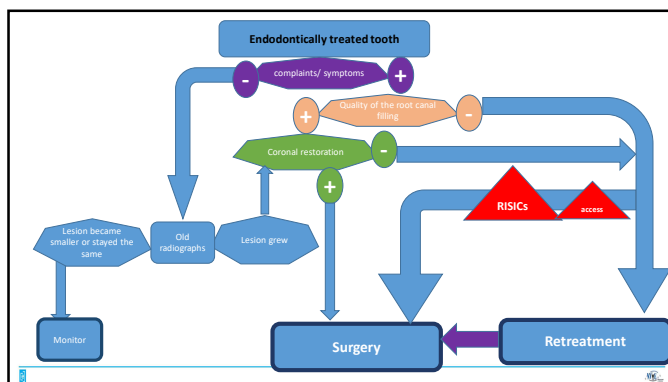


no clear evidence of superiority of the surgical vs. non-surgical approach

AZIM A. ET AL. INT ENDO J. 2021 MAR;54(3):301-318.

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26



27

Review Cochrane Database Syst Rev 2016

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Del Fabbro M, Corbella S, Sequeira-Byron P, Tsesis I, Rosen E, Lolato A, Taschieri S

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28

How to manage failure of a root canal treatment?

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- Monitor
- **Retreatment**
- Surgical endodontics
- Combination
- Extraction

Reit C, Gröndahl HG. Swed Dent J. 1984;8(1):1-7.

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29

How to manage failure of a root canal treatment?

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- Monitor
- Retreatment
- Surgical endodontics
- Combination
- Extraction

Reit C, Gröndahl HG. Swed Dent J. 1984;8(1):1-7.

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30

How to manage failure of a root canal treatment?

- Monitor
- Retreatment → Selective retreatment
- Surgical endodontics
- Combination
- Extraction

Reit C, Gröndahl HG. Swed Dent J. 1984;8(1):1-7.

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31

The partial retreatment

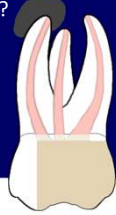


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32

● Partial/ selective retreatment

Why do we resect and treat only the root with a periapical lesion with surgical endodontics but insist on retreating all canals in an orthograde approach?



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33

37 Mandibular Molars

First Time Surgery

PAI SCORE (PAI ≥ 3 - APICAL PATHOSIS)

5 Years follow up

Periapical X-Rays

KRAUS RD ET AL. J ENDOD. 2015;41(4):442-6.

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34



NON OPERATED ROOT

8,1%

KRAUS RD ET AL. A 5-YEAR FOLLOW-UP STUDY. J ENDOD. 2015;41(4):442-6.

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35

Conclusions

Nonoperated roots rarely developed signs of new apical pathosis 5 years after apical surgery of the other root in mandibular molars. It appears reasonable to resect and fill only roots with a radiographically evident periapical lesion.

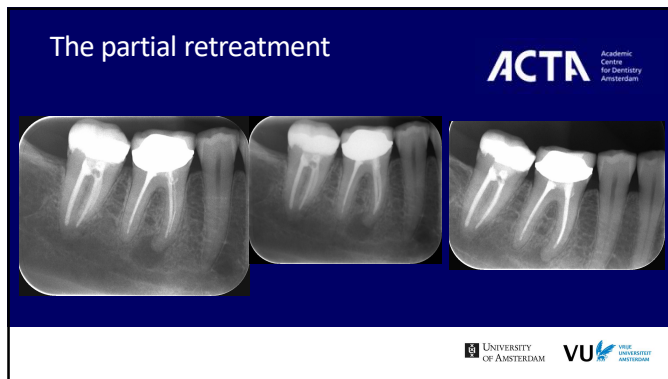
NON OPERATED ROOT

8,1%

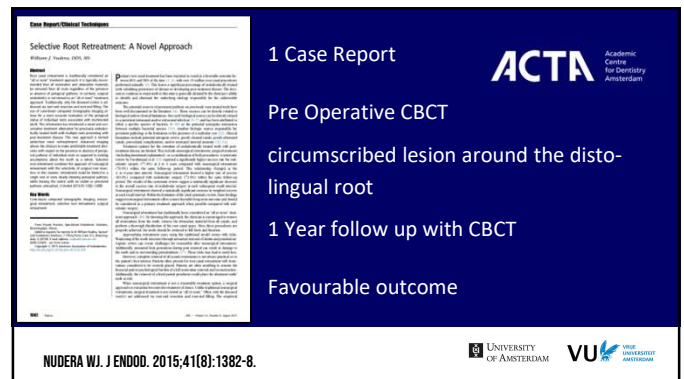
KRAUS RD ET AL. A 5-YEAR FOLLOW-UP STUDY. J ENDOD. 2015;41(4):442-6.

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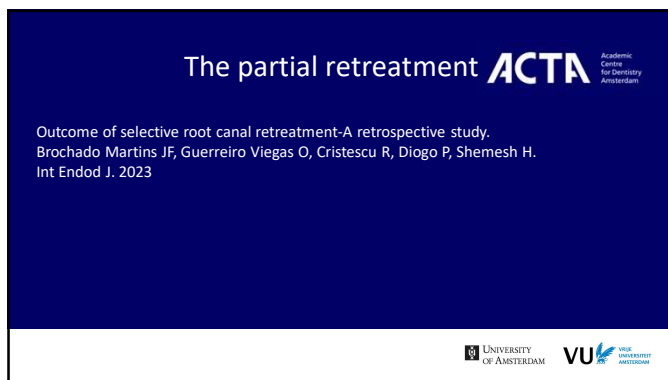
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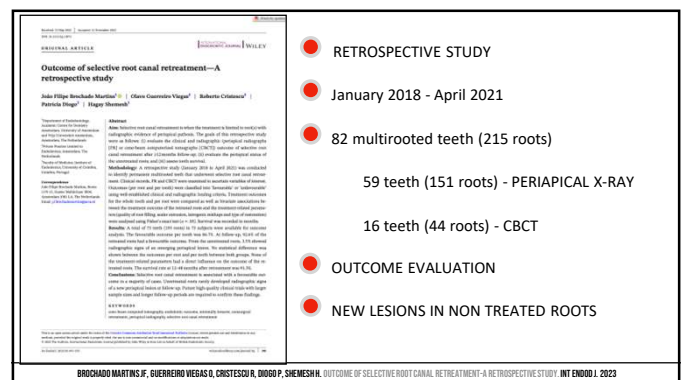
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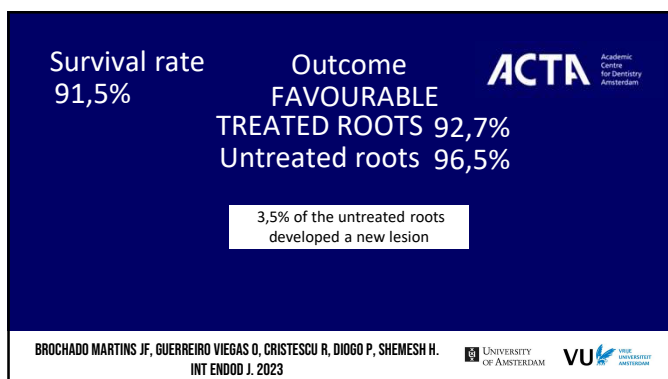
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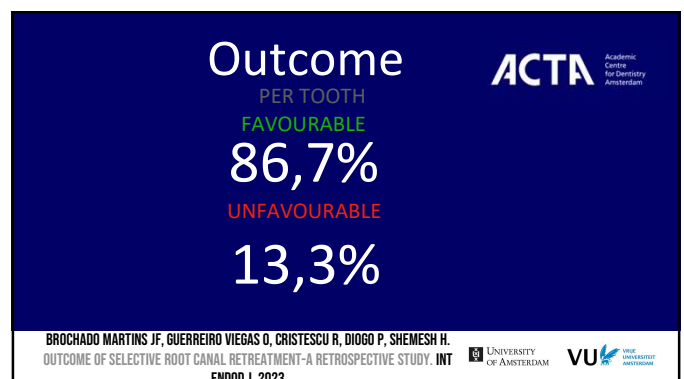
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40



41




42

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Pros

- Less expensive
- Less iatrogenic errors
- Minimal invasive
- Less time



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
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Additional aspects

Cost effectiveness :

INTERNATIONAL ENDODONTIC JOURNAL
The official journal of the British Endodontic Society and the European Society of Endodontology

ORIGINAL ARTICLE    

Cost-effectiveness analysis of full versus selective root canal retreatment

Johanna Brochado Martins, Shemesh Haggy, Sachin Rajat Patel, Schwenkdicke F.

First published: 21 September 2023 | <https://doi.org/10.1111/iej.15872>

Selective retreatment, when clinically applicable, is likely to be more cost-effective than full retreatment in endodontically treated molars with persistent apical periodontitis.

BERLIN

Three-rooted molar with apical pathology on one root

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graph TD
    A[Three-rooted molar with apical pathology on one root] --> B[Selective re-treatment]
    A --> C[Full re-treatment]
    B --> D[Failure other roots]
    B --> E[Re-treat other roots]
    C --> F[Failure re-treated root]
    C --> G[Apicectomy surgical re-treatment]
    G --> H[Extraction and implant-supported crown]
    H --> I[Implant/crown-related failure (ex. Replantation/renew crown/renew implant)]
  
```


BROCHADO MARTINS JF, SHEMESH H, HERBST SR, SCHWENDICKE F.. INT ENDOD J. 2023

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44

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BMC Oral Health

RESEARCH 

Does selective root canal retreatment preserve the tooth's fracture resistance? An ex-vivo study

Mohammed Turkey, Yasmine Ahmed Mortada Abd Elfatah, Shaimaa Hamdy

Conclusions Selective root canal retreatment preserved the tooth's fracture resistance compared to the conventional retreatment approach.

BMC Oral Health. 2024 Oct 19;24(1):1251.
Mohammed Turkey, Yasmine Ahmed Mortada Abd Elfatah, Shaimaa Hamdy

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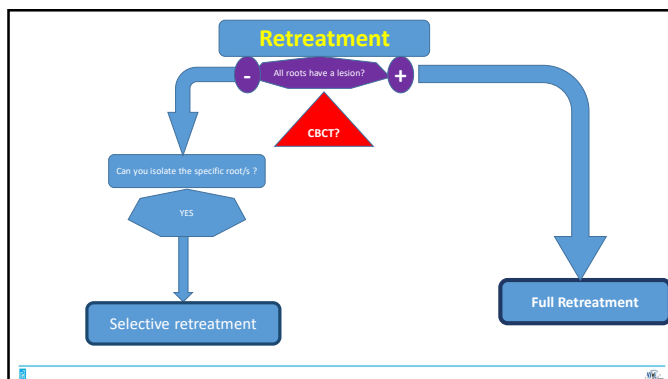
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Question still unanswered:

- Is 2D imaging enough ? CBCT ?

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46



47

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AAE and AAOMR Joint Position Statement


Use of Cone Beam Computed Tomography in Endodontics—2015/2019 Update

Recommendation 7: Limited FOV CBCT should be the imaging modality of choice when evaluating the nonhealing of previous endodontic treatment to help determine the need for further treatment, such as nonsurgical, surgical or extraction.

AAE AND AAOMR JOINT POSITION STATEMENT: USE OF CONE BEAM COMPUTED TOMOGRAPHY IN ENDODONTICS 2015 UPDATE. J ENDOD. 2015 SEP;41(9):1393-6.

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48



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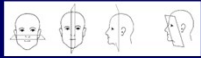
Non Root filled + Root Filled Teeth
Histology as reference Standard
diagnostic accuracy of CBCT was dependent on the endodontic treatment status

ROOT-FILLED ROOTS - LOWER ACCURACY
NON-ROOT-FILLED ROOTS - HIGH ACCURACY

KRUSE C. ET AL. INT ENDO J. 2019;52(4):439-50.

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49



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“While CBCT offers greater diagnostic precision, its routine use for outcome evaluation may not be necessary, as it produces similar results compared to PR, when applying loose criteria.”

BROCHADO-MARTINS J, GEORGIU A.C, DE-VRIES R, PALMA P, DIOGO P, SHEMAH H. JOE 2025

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50

Verwijzing naar de endodontoloog

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- Verwijsbrief, foto's incl. oude foto's indien beschikbaar
- Behandelplan
- Wat is er met de patient besproken? (verwachting, prognose, alternatieven...)
- Wat is reeds uitgevoerd?
- Relevante medische/ tandheelkunde voorgeschiedenis

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51

Take HOME message

Quality? Leakage? Missed anatomy? CBCT?

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- When you suspect a failed RCT always think first about the possible reason
- Can this reason be addressed by a retreatment?
- Can I improve the situation? Can I preform the treatment?
- Always pose 4 options to the patient : Do nothing, Extraction, Retreatment, surgery

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52