

Retreat or not retreat ? An exercise in forming a guideline

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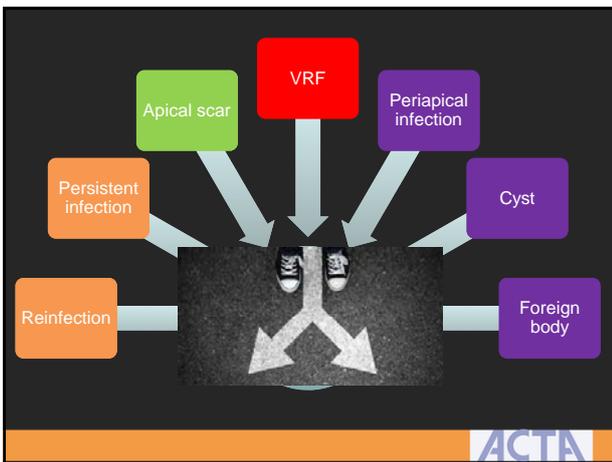
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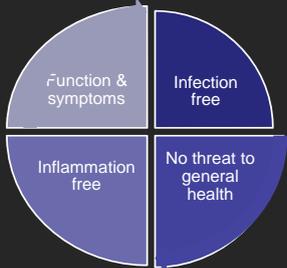


The decision of re-treating (or not) asymptomatic apical periodontitis is an *opinion* rather than evidence based





- What are our goals when we treat AP ?




Function & Symptoms

97% of 1.4 million teeth were functional 8 years following non-surgical root canal treatment

Salehrabi & Rotstein 2004 JOE



The success of endodontic therapy-healing and functionality.
Friedman S, Mor C.

Functionality = 86-92%

Friedman & Mor 2004 J Calif Dent Assoc





• What are our goals when we treat AP ?

Function & symptoms

Infection free

Inflammation free

No threat to general health

ACTA

Bacteria recovered from teeth with AP after antimicrobial endodontic treatment.

Once established, nonmutans streptococci, enterococci and lactobacilli appear to survive commonly following root-canal treatment of teeth with clinical and radiographical signs of AP.

Chavez de Pas et al. 2003 IEJ

ACTA

In 90% of the infected canals, bacterial biofilm remained in the apical 3 mm after root canal treatment.

RF RF

AP

Nair et al. 2005 OOOOE

ACTA

Current procedures are not effective in eliminating root infection.

ACTA

• What are our goals when we treat AP ?

Function & symptoms

Infection free

Inflammation free

No threat to general health

ACTA

Lesions of endodontic origin and risk of coronary heart disease.

“These findings are consistent with research that suggests relationships between chronic periodontal inflammation and the development of CHD, especially among younger men.”

Caplan et al. 2006 JDR

ACTA

Endodontic variables and coronary heart disease.

“ This cross-sectional study did not reveal a significant association between endodontically treated teeth and CHD nor between teeth with periapical disease and CHD.”

Frisk et al. 2003 ACTA odontol Scand

ACTA

The impact of Endodontic Infections on the pathogenesis of Cardiovascular disease : A systematic review with meta- analysis

“Whether the presence of a lesion of endodontic origin may or may not have some impact on cardiovascular disease, the level of evidence is low, and our confidence in the assessment is low”.

Aminoshariae et al. 2018 JOE

ACTA

Association Between Periodontal Disease and Erectile Dysfunction: A Systematic Review

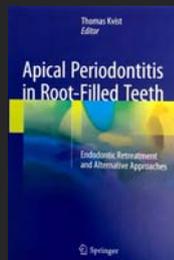
It is emphasized that physicians should refer patients with ED to oral health care providers for a comprehensive oral evaluation and treatment.

There are several confounders, such as age and the type of ED, that failed to be adjusted and that generate bias and affect the correlation between the incidence of ED and PD.

Kellesarian et al. 2016 Am J Mens Health

ACTA

- ‘ At present time the association between endodontic disease and different systemic conditions rests on shaky grounds.’



Frisk & Kvist 2019 AP in root-filled teeth

ACTA

- What are our goals when we treat AP ?

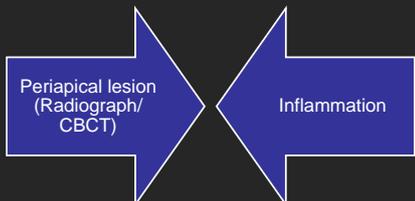


ACTA



Outcome is determined clinically (lack of signs & symptoms) and radiographically

ACTA

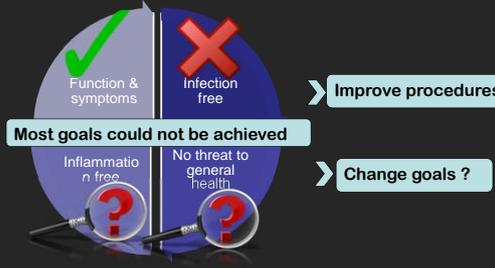


Periapical lesion (Radiograph/ CBCT)

Inflammation

ACTA

- What are our goals when we treat AP ?



Function & symptoms

Infection free

Inflammation free

No threat to general health

Most goals could not be achieved

Improve procedures

Change goals ?

ACTA

A periapical lesion could be limited or kept under control but not always disappear

Maybe we should learn to live with it

Management of periapical periodontitis

ACTA



2009

2012

2015

2019

ACTA

Patient-centered outcome:
Quality of Life
Costs/ pain
Functionality



Disease-centered outcome:
Healing of the periapical lesion



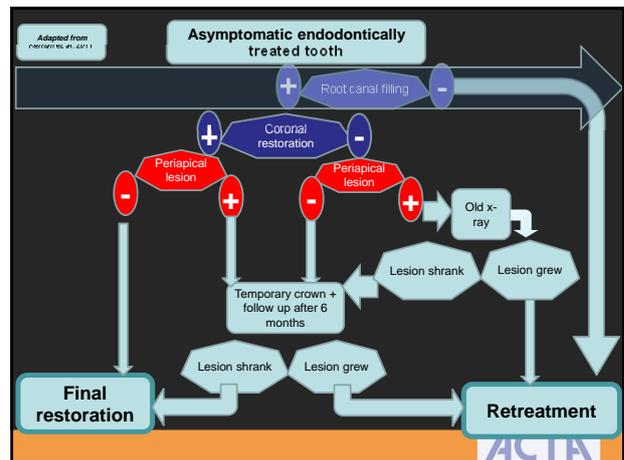
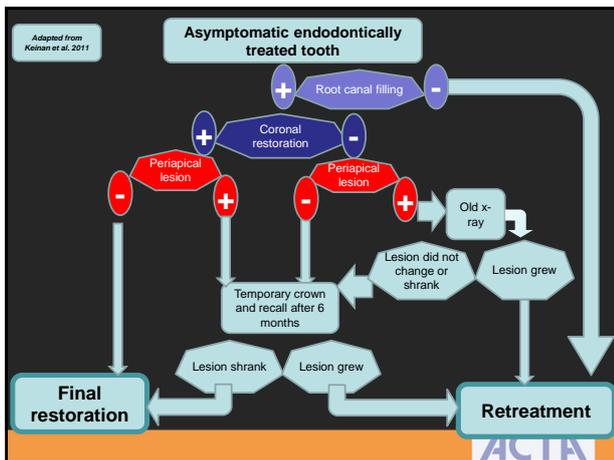
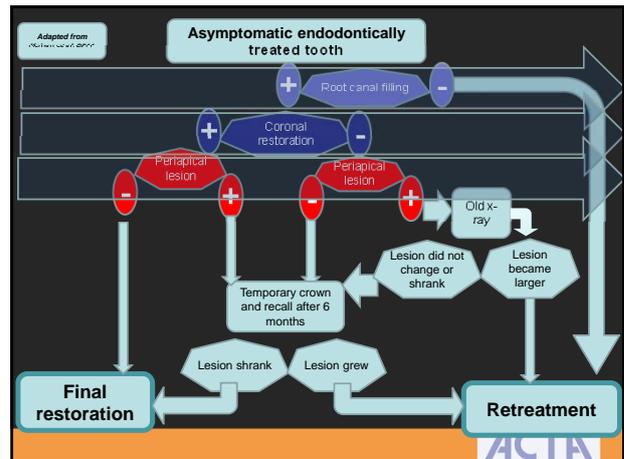
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How to make the decision?

1. Complaints
2. Quality of the root canal filling
3. Quality of the coronal restoration
4. Presence of a periapical lesion

Decision tree

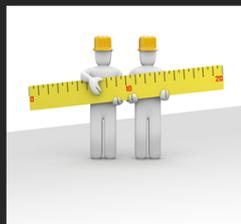
J Am Dent Assoc. 2011 Is endodontic re-treatment mandatory for every relatively old temporary restoration? – a review. Keinan D, Moshonov J, Smidt A.



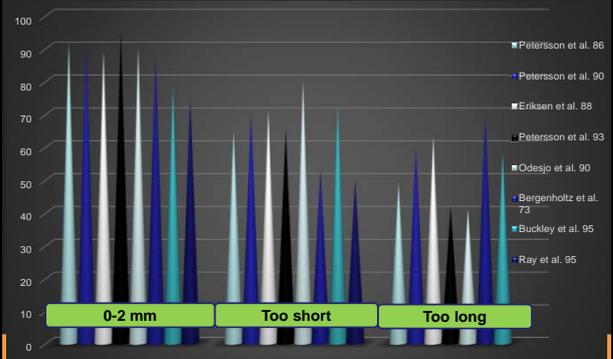
A "good" root canal filling is...



Density
Length: 0-2 mm



Success of the root canal treatment as a function of the root canal filling's length



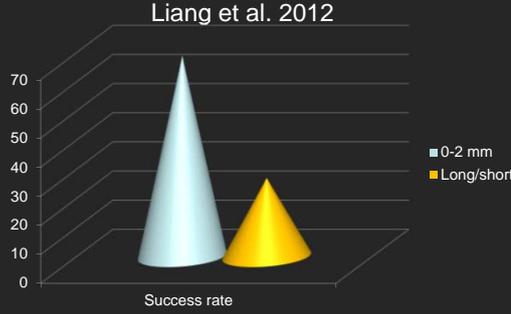
Clinical outcome studies show a consistent preference for root canal fillings that are 0-2 mm from the radiographic apex

(Ng et al. 2008)

IEJ 2008. Outcome of primary root canal treatment: systematic review of the literature -- Part 2. Influence of clinical factors. Ng, Mann, Rahbaran, Lewsey, Gulabivala



Liang et al. 2012



Success rate

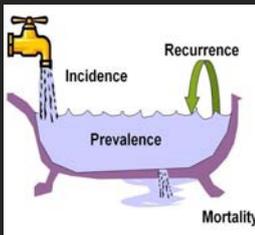
■ 0-2 mm
■ Long/short

Clin Oral Investig 2012. The association between complete absence of post-treatment periapical lesion and quality of root canal filling. Liang, Li, Shemesh, Wesselink, Wu



Prevalence studies

- The prevalence of periodontitis apicalis is the number of cases per 1000 people on a specific moment in a population




Int Endod J. 2011. Prevalence of apical periodontitis relative to endodontic treatment in an adult Dutch population: a repeated cross-sectional study. Peters, Lindeboom, Elst, Wesselink.

Inadequate root canal fillings were frequent (55.8%). Apical radiolucency was significantly higher in these teeth than in adequately root-filled teeth.

Int Endod J. 2014 Ten-year follow-up of root filled teeth: a radiographic study of a Danish population. Kirkevang LL, Vaeth M, Wenzel A.

The probability of persistent AP was higher if the root filling was either short or long, if there were voids, or if there were radiographic signs of overhang or open margin of the restoration



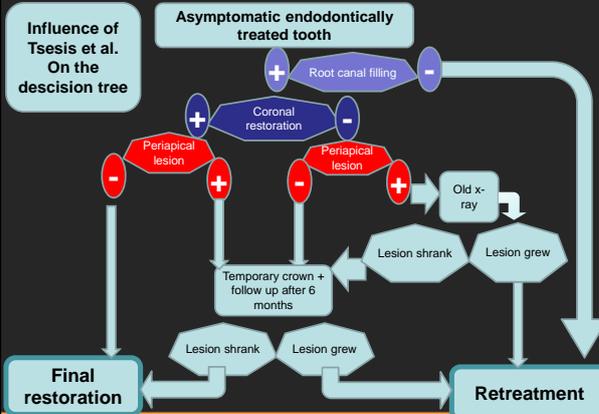
JOE 2013 The dynamics of periapical lesions in endodontically treated teeth that are left without intervention: a longitudinal study. Tsesis et al.

200 endodontically treated teeth with a periapical lesion
No treatment was performed
Follow up 4 or more years

Conclusion: inadequate root canal filling or coronal restoration can negatively influence an existing periapical lesion



Influence of Tsesis et al. On the decision tree



Asymptomatic endodontically treated tooth

Root canal filling (+)

Coronal restoration (+)

Periapical lesion (-)

Old x-ray (+)

Lesion shrank

Lesion grew

Temporary crown + follow up after 6 months (+)

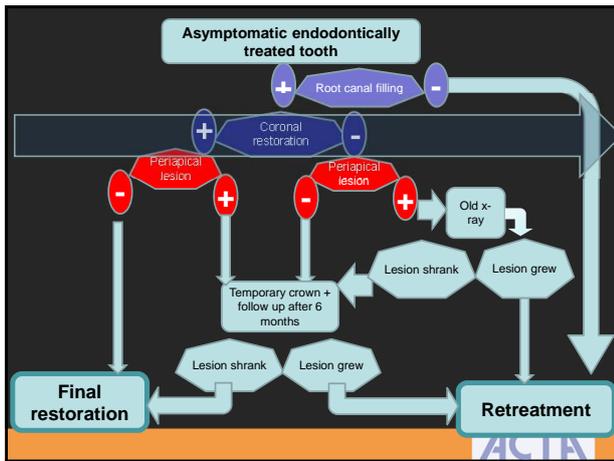
Lesion shrank

Lesion grew

Final restoration

Retreatment





• Leakage !

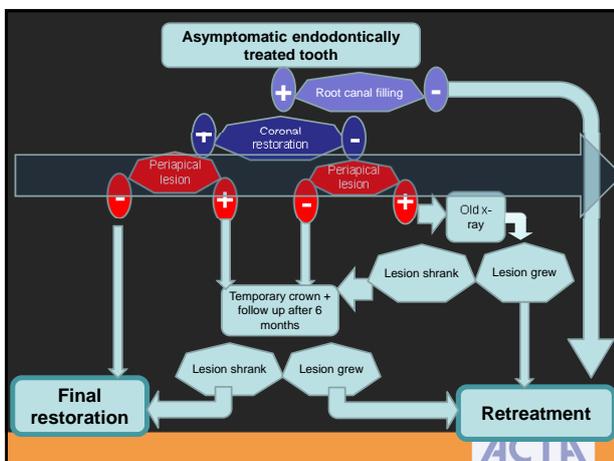
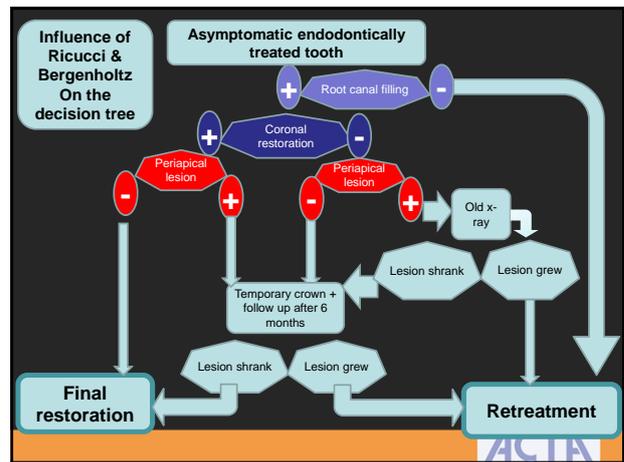
- In vitro leakage models :
All root canal fillings leak after a few months (Shemesh et al. 2006)

In other words: Leaking coronal restoration means that the whole root canal csystems will be reinfected after a few months

• Leakage ?

Int Endodo J 2003 Bacterial status in root-filled teeth exposed to the oral environment by loss of restoration and fracture or caries—a histobacteriological study of treated cases. Ricucci & Bergenholtz

Int Endodo J 2008. Potential systematic error in laboratory experiments on microbial leakage through filled root canals: an experimental study. Rechenberg, Thurnheer, Zehnder



• How reliable are x-rays in detecting periapical lesions?

International Endodontic Journal

REVIEW

Limitations of previously published systematic reviews evaluating the outcome of endodontic treatment

M.K. Wu, H. Shemesh & P. R. Wessink

Departments of Endodontology, Academic Centre of Dentistry Amsterdam (ACTA), University of Amsterdam and TU University, Amsterdam, The Netherlands

“The outcomes of root canal treatment should be re-evaluated in long-term longitudinal studies using CBCT and stricter evaluation criteria.”

Should we treat all periapical lesions?

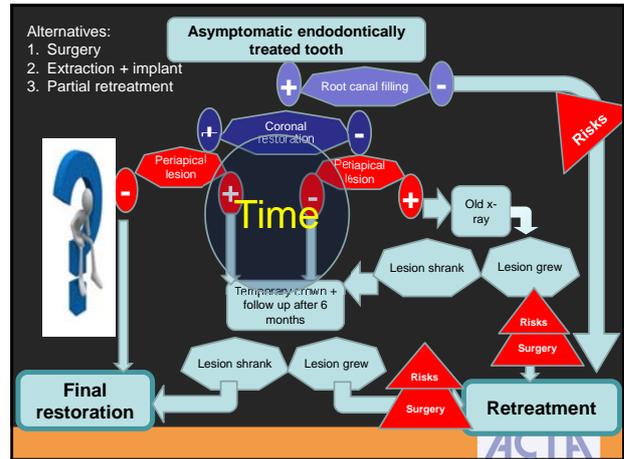
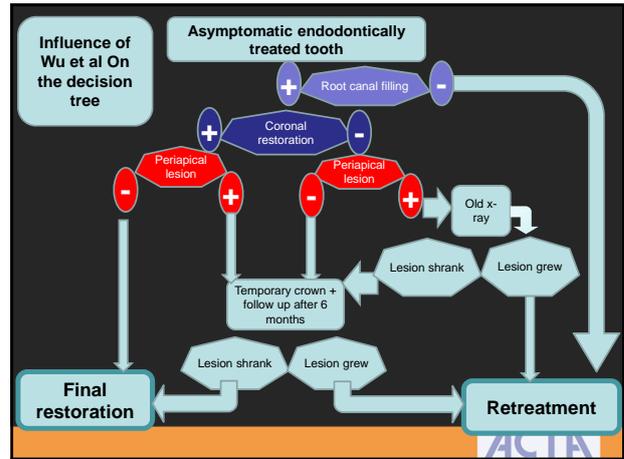
1. General health?
2. "the accidental finding"
3. Dynamics of the healing process

Int J Cardiol. 2011 Can a chronic dental infection be considered a cause of cardiovascular disease? A review of the literature. Cotti E et al .

J Endod. 2011 Association of endodontic infection with detection of an initial lesion to the cardiovascular system. Cotti E et al.

Apical periodontitis as an accidental finding Wesselink P.R 2010

Int Endod J. 2008 Outcome of secondary root canal treatment: a systematic review of the literature. Ng YL et al.



Surgery or retreatment ?

- Failure of a retreatment
- Limited access (or anatomical abbrator)
- Risks
- Costs
- Operator



J Endod. 2010 Treatment outcome in endodontics: the Toronto study - phases 3, 4, and 5: apical surgery. Barone et al.



Conclusions

- Think about the reason for failure and the aim of the treatment before venturing further
- Consider alternatives and discuss these with the patient
- A guideline makes the decision easier to defend and reproducible (Although not uniform...)
- A guideline/ decision tree should always be used together with clinical experience and individual considerations / preferences/ expectations of the patient and operator. (And one aspect is not more important than the other)