

To treat or not to treat ?
Asymptomatic periapical periodontitis

Hagay Shemesh, DMD, PhD
Department of Endodontology
Groot-Mollerstraat 3004
1055 LA Amsterdam
The Netherlands
Tel.: +31(0)20 59 80139
E-mail: hshemesh@acta.nl
www.acta.nl

ACTA
ACADEMIC CENTRE
FOR DENTISTRY AMSTERDAM

AAE and Endodontic success: asymptomatic teeth with a small post-treatment lesion

COMMUNIQUE
AUGUST/SEPTEMBER 2005

Endodontic Outcomes

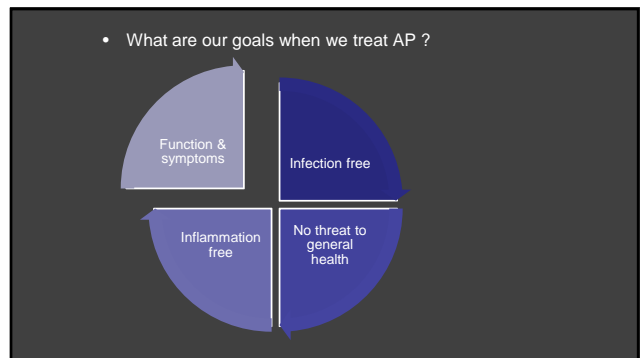
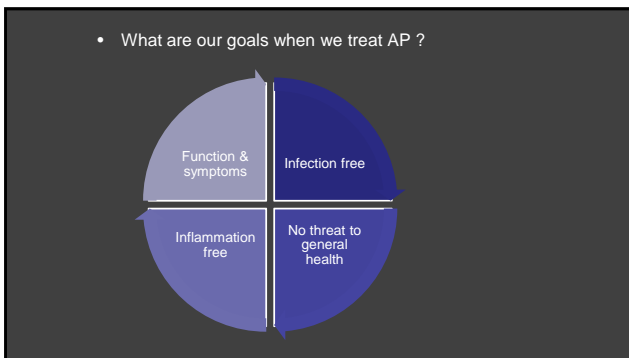
There has been a scientific consensus on the terms of endodontic success. Throughout the years, a number of terms have been used to determine the outcome of root canal treatment. Clinical and/or radiographic indices, the periapical index or a combination of these are examples of the various benchmarks. Recently, the AAE took a significant step toward creating greater uniformity. At its annual meeting in Dallas, the AAE Board of Directors approved new definitions of endodontic outcomes.

The definition is the product of several years of work and deliberation from a number of groups within the Association.

Approved Definitions of Endodontic Outcomes

Healed—Functional, asymptomatic teeth with no or minimal radiographic periradicular pathosis.

- **Nonhealed**—Nonfunctional, symptomatic teeth with or without radiographic periradicular pathosis.
- **Healing**—Teeth with periradicular pathosis, which are asymptomatic and functional, or teeth with or without radiographic periradicular pathosis, which are symptomatic but whose intended function is not altered.



Function & Symptoms

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

Salehrabi & Rotstein 2004 JOE

ACTA

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 ?

ACTA

Bacteria recovered from teeth with apical periodontitis 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 apical periodontitis.

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.

Nair et al. 2005 OOOOE

ACTA

- What are our goals when we treat AP ?

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

Apical periodontitis and cardiovascular diseases: previous findings and ongoing research.

RESULTS AND CONCLUSIONS:

- (i) Poor oral health and endodontic infections are associated with cardiovascular diseases, and endodontic infection appears to be associated with initial endothelial damage,
- (ii) preventive measures for IE should be adopted during endodontic treatment of patients at risk for cardiovascular events according to the American and European available official guidelines, and
- (iii) more research focused on apical periodontitis and systemic diseases is needed.

Cotti and Mercurio 2015 IEJ

Association of Endodontic Lesions with Coronary Artery Disease

"Our findings support the hypothesis that LEO's are independently associated with coronary artery disease and in particular with acute coronary syndrome"

Liljestrand et al. 2016 JDR

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

"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

Endodontics and diabetes: association versus causation.

...once a significant statistical association has been found ..., it is necessary to exclude the presence of bias, which would imply that the association is artefactual, and to analyze if the causation criteria defined by Hill (1965) are fulfilled to establish a causal relationship. Only if they are satisfied, can it be concluded that the association is causal.

Segura Egea et al. 2019 IEJ in print

Association Between Periodontal Disease and Erectile Dysfunction: A Systematic Review

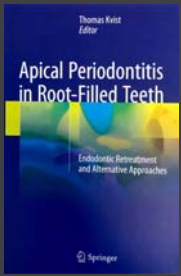
It is emphasized that physicians should refer patients with ED to oral health care providers for a comprehensive oral evaluation and treatment.

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

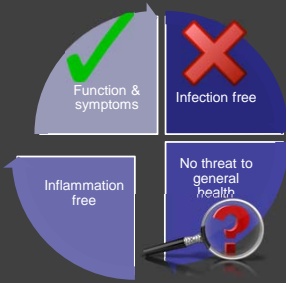

ACTA

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

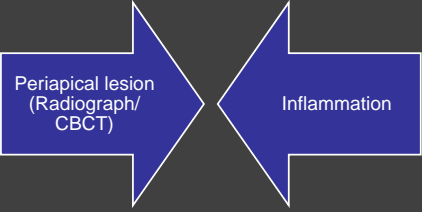


Frisk & Kvist 2019 AP in root-filled teeth

- What are our goals when we treat AP ?

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



Diagnostic accuracy of CBCT used for assessment of apical periodontitis: an ex vivo histopathological study on human cadavers.

Diagnostic accuracy of periapical radiography and CBCT in detecting apical periodontitis using histopathological findings as a reference standard.

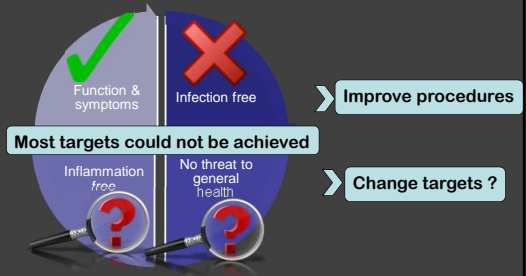
Diagnostic accuracy of CBCT used for diagnosis of AP is dependent on the treatment status of the tooth.

CBCT had significantly higher diagnostic accuracy in detecting AP compared to PR

Kruse et al. 2019 IEJ

Kanagasingam et al. 2017 IEJ

- What are our goals when we treat AP ?



Improve procedures

Change targets ?

Ørstavik & Pitt Ford ed. *Essential Endodontology* 1998
 Friedman S. *Endod Top* 2002, Trope M. *Endod Top* 2003

Clinical endodontics is defined as the prevention and/or elimination of apical periodontitis.

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

Maybe we should learn to live with it

Treatment Management of periapical periodontitis



COMMUNIQUE
 AUGUST/SEPTEMBER 2005

AAE and Endodontic success: asymptomatic teeth with a small post-treatment lesion

There has been a... are constructed on the scientific com... constitutes end...
 Throughout the... have used a number of terms and criteria to determine the outcome of root canal treatment. Clinical and/or radiographic indices, the periapical index or a combination of these are examples of the various benchmarks. Recently, the AAE took a significant step toward creating greater uniformity. At its annual meeting in Dallas, the AAE Board of Directors approved new definitions of endodontic outcomes.

The definition is the product of several years of work and deliberation from a number of groups within the Association

... that the commonly used terms of "success" and "failure" are too vague. Success or failure can be attributed to a variety of factors. On the other hand, terms such as "healed," "nonhealed" and "healing" focus on the tooth, its surrounding structures and the host response. These are also words that patients can understand more easily. Function is one of the primary determinates for successful outcomes as it reflects clinical conditions with or without radiographic evidence of pathosis. Not all cases can be definitively categorized as healed, nonhealed or healing. When the outcome is uncertain, the clinician must use intuition and proper clinical judgment to ascertain the status of the tooth at that

Approved Definitions of Endodontic Outcomes

- Healed**—Functional, asymptomatic teeth with no or minimal radiographic periradicular pathosis.
- Nonhealed**—Nonfunctional, symptomatic teeth with or without radiographic periradicular pathosis.
- Healing**—Teeth with periradicular pathosis, which are asymptomatic and functional, or teeth with or without radiographic periradicular pathosis, which are symptomatic but whose intended function is not altered.

The incidental discovery of apical periodontitis.

Case : A. Braun

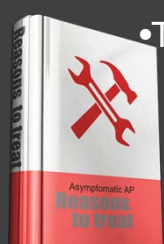


Not to treat
 To treat

Wessellink 2014 Endodontic Topics



- The lesion may flare up
- The lesion may expand and damage surrounding structures
- The lesion may affect general health

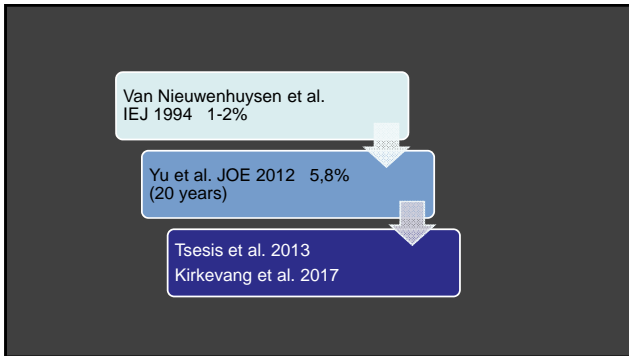


- The lesion may flare up

" it can get painful/ swollen while you are on vacation "

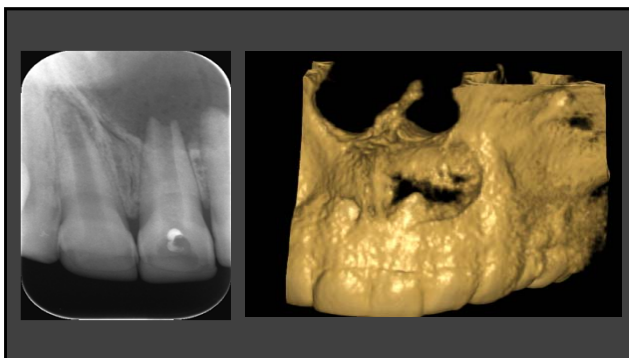
"It can spread to adjacent teeth"

"We do not know when will it get painful but it will, so why take the chance ?"



•The lesion may expand and damage surrounding structures

The image shows a 3D rendering of a book with a white cover and a red spine. The cover features a red crossed-wrenches icon and the text 'Asymptomatic AP Reasons to treat'. To the right of the book, a bullet point states: '•The lesion may expand and damage surrounding structures'.



Paresthesia of the mental nerve after an acute exacerbation of chronic apical periodontitis.

Gilbert & Dickerson 1981 JADA

Apical infection spreading to adjacent teeth: a case report.

Kombayashi et al. 2011 OOOOE

The text is centered on a dark background. The first sentence is followed by a citation in a blue box. The second sentence is followed by another citation in a blue box.

Risk of severe events, requiring hospitalization because of a root filled tooth with AP is extremely small and is estimated to be around 1:200,000

Hospital-based Emergency Department Visits with Periapical Abscess: Updated Estimates from 7 Years.

Rampa et al. 2019 JOE

The text is centered on a dark background. The first sentence is followed by the second sentence. The citation is in a blue box at the bottom.

•The lesion may affect general health

Still no final conclusion can be made.

The image shows a 3D rendering of a book with a white cover and a red spine. The cover features a red crossed-wrenches icon and the text 'Asymptomatic AP Reasons to treat'. To the right of the book, a bullet point states: '•The lesion may affect general health'. Below this, the text 'Still no final conclusion can be made.' is displayed.



- The lesion is there many years
- The treatment is burdensome, costly, limited effective and may induce pain
- The tooth will be weakened

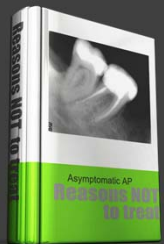


- The lesion is there many years

Periapical changes following root-canal treatment observed 20-27 years postoperatively.

"Late periapical changes, with more successes than failures, were recorded when a 10-17-year follow-up period after root-canal treatment was extended for another 10 years."

Molven et al. 2002 IEJ



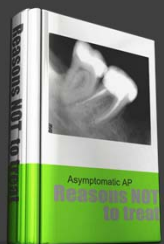
- The treatment is burdensome, costly, limited effective and may induce pain

Treatment may induce pain

20- 50% of the patients experience some pain after endodontic treatment

3-5% is severe

Preoperative and operative factors associated with pain after the first endodontic visit.
 Genet JM, Hart AA, Wesselink PR, Thoden van Velzen SK.
 Int Endod J. 1987 20; 53-64.



- The tooth will be weakened

Influence of Irrigation Sequence on the Adhesion of Root Canal Sealers to Dentin: A Fourier Transform Infrared Spectroscopy and Push-out Bond Strength Analysis.

Neelakantan et al. 2015 JOE

Fracture Strength of Endodontically Treated Teeth with Different Access Cavity Designs.

Plotino et al. 2017 JOE

Uncontrolled Removal of Dentin during In Vitro Ultrasonic Irrigant Activation in Curved Root Canals.

Retsas et al. 2016 JOE

Uncontrolled Removal of Dentin during In Vitro Ultrasonic Irrigant Activation.

Boutsioukis & Tzimpoulas et al. 2016 JOE

Reasons NOT to Treat Asymptomatic AP

- The lesion is there many years ✓
- The treatment is burdensome, costly, limited effective and may induce pain ✓
- The tooth will be weakened ✓

Reasons to Treat Asymptomatic AP

- The lesion may flare up
- The lesion may expand and damage surrounding structures
- The lesion may affect general health

Returning to our patient...

The decision of the patient

.....and the outcome after 3 years

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

Disease-centered outcome:
Healing of the periapical lesion

The decision of treating or not treating asymptomatic apical periodontitis is an opinion rather than evidence based

- Hopefully, we can soon agree on a set of criteria for a clinical decision, until more evidence becomes available

Keinan et al. 2011 JADA

ACTA

