

The root canal filling-What should I use?

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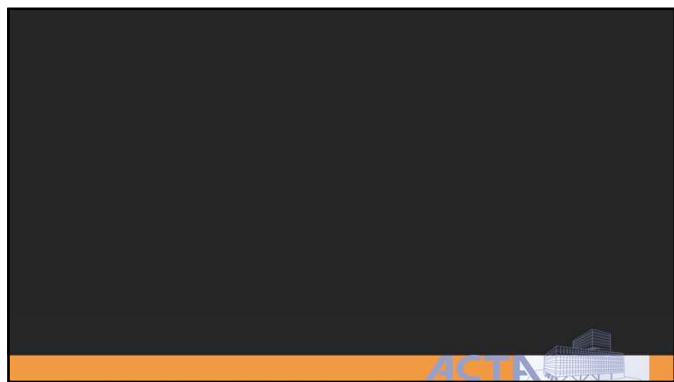


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I have no commercial or financial affiliations with any of the products / methods or companies that will be mentioned in this lecture.



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What will I speak about

- Prologue Why is it important to talk about the filling?
- Story The forgotten oval canal
- Methods Filling methods and materials
- Interlude Attack of the Ninja
- Epilogue The meeting I have next week...



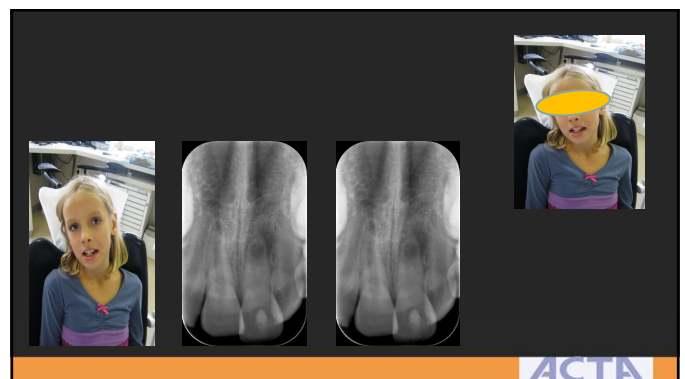
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Is the root canal filling important?

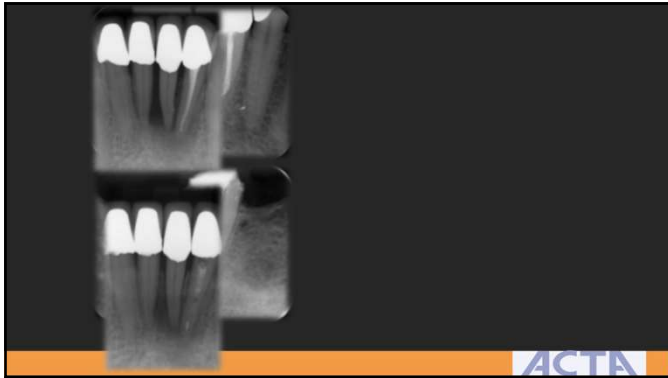
- 1898 **Eberly** "What is filled in the prepared **root canal** is not as important as what is removed from it".
- "Thorough cleaning of the root canal is more important for the success of the treatment than any other obturation technique"



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Healing of the periapical lesion also without canal filling

- Saatchi 2007
- Ozan & Er 2005
- Felipe et al. 2005
- Katebzadeh et al. 1999
- Klevant & Eggink 1983

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Healing of apical periodontitis after endodontic treatment with and without obturation in dogs

The noteworthy finding of this study was that there was no difference in healing between the obturated and nonobtured canals.

Sabeti et al. JOE 2009

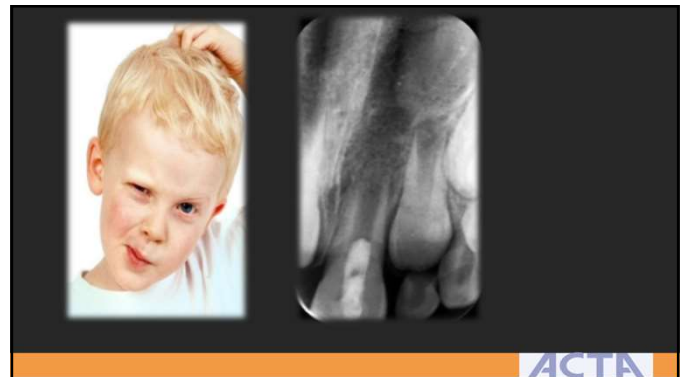


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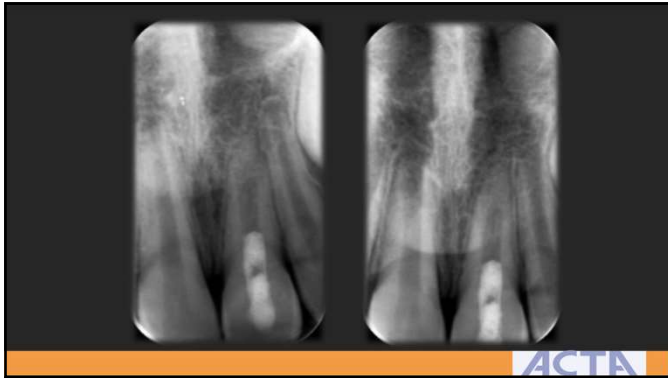
Maybe the root canal filling is not so important at all ???



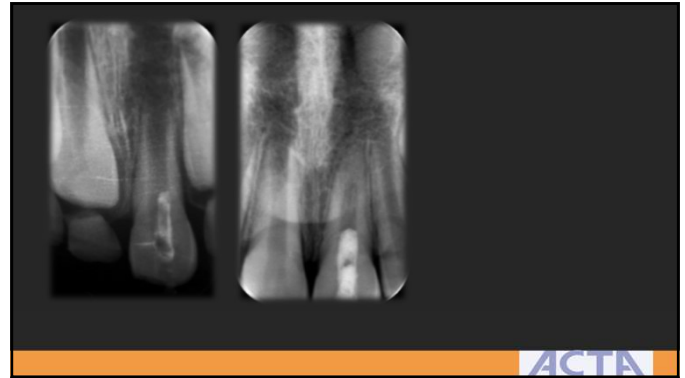
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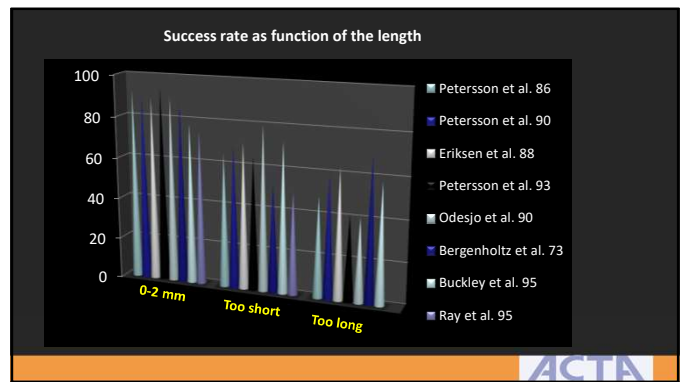
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Maybe the root canal filling is not so important at all ???

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- The quality of the endodontic treatment was the most important factor for success, although the quality of the coronal restoration also influenced the treatment outcome

Clinical Research

Prevalence of Apical Periodontitis in Root Canal-Treated Teeth From an Urban French Population: Influence of the Quality of Root Canal Fillings and Coronal Restorations

Flavia B.L. Tavares, MSc,* Eric Boute, DDS,¹ Tchibalo Bonkpesi, DDS,² José F. Siqueira, Jr, PhD,³ and Jean-Jacques Lussignea, PhD⁴

Tavares et al. JOE 2009

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Ten-year follow-up of root filled teeth: a radiographic study of a Danish population.

The root filling quality primarily affected the risk of persistent AP and to a smaller extent the risk of extraction...

Kirkevang et al. IEJ 2014

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

- A total of 178 radiographs were evaluate
- Inadequate root canal fillings were frequent (55.8%). *Apical radiolucency was significantly higher in these teeth than in adequately root-filled teeth.*

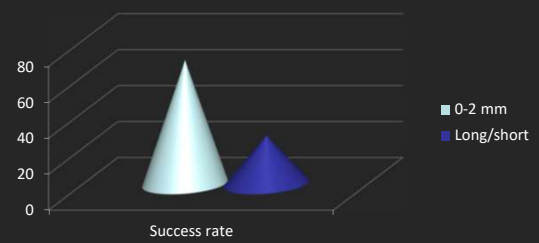
Peters et al. 2011



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Clinical studies with CBCT



Liang et al. 2011-2012

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- “An adequate root filling had a more substantial impact on the outcome of treatment than the quality of the coronal restoration”



Segura-Egea et al. IEJ 2004

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Ng et al. 2008 (IEJ)

- 4 conditions improve the outcome :
1. pre-op absence of periapical radiolucency
 2. root filling with no voids
 3. root filling length
 4. satisfactory coronal restoration

Ng et al. IEJ 2008



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- How come the quality of the filling is important but there is healing also WITHOUT a filling???



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The filling dilemma

- Long/short term
- Prevention of re-infection
- Coronal restoration (Post, core)
- Over-filling causes irritation
- We introduce infection



Patel et al. IEJ 2012



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- The root-canal filling IS important for the outcome of the root-canal treatment (but the coronal restoration is probably equally important)

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The story of the oval canal...

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Look at me!

- Can't you see I am oval ???

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Figure 1: Cross-section of a mandibular canine with an oval shaped canal.



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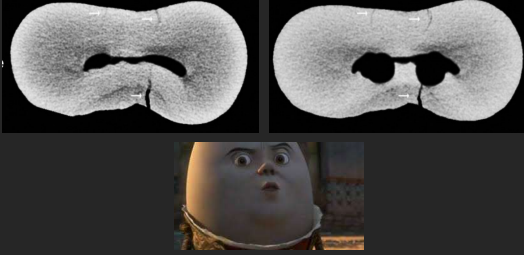
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- Prevalence and extent of long oval canals in the apical third
- Quality of cold and warm gutta-percha fillings in oval canals in mandibular premolars
- A primary observation on the preparation and obturation of oval canals



Wu et al OOOE, IEJ 2000-2001

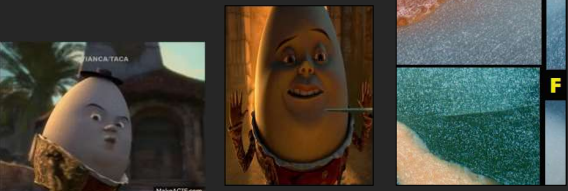

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De-Deus et al. JOE 2014

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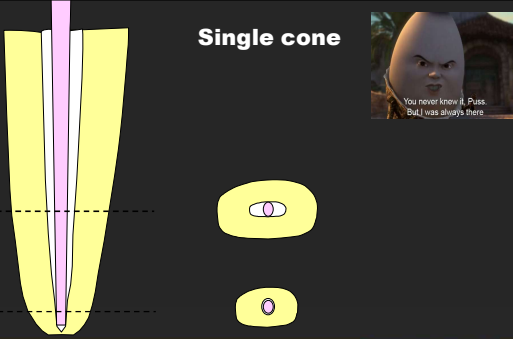

Canals containing debris cannot be properly filled

De-Deus et al. JOE 2012

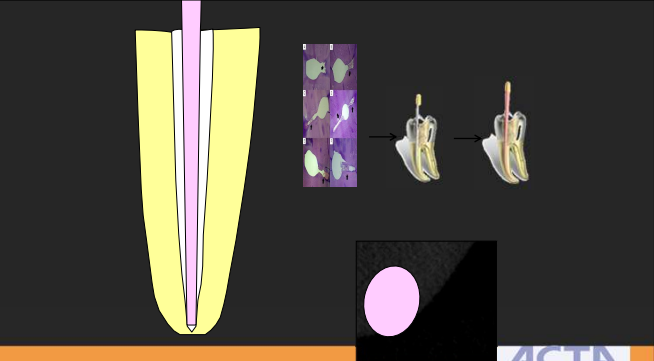




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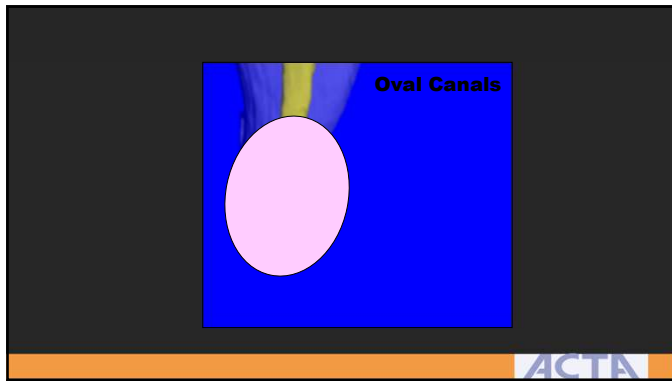
Single cone

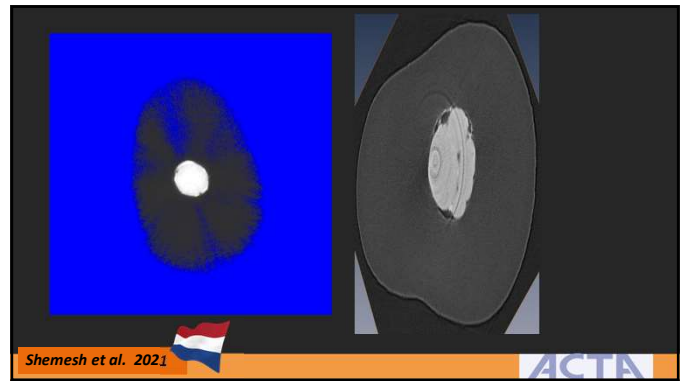
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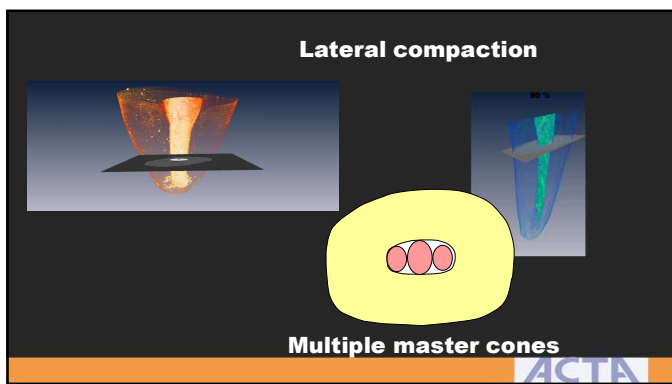
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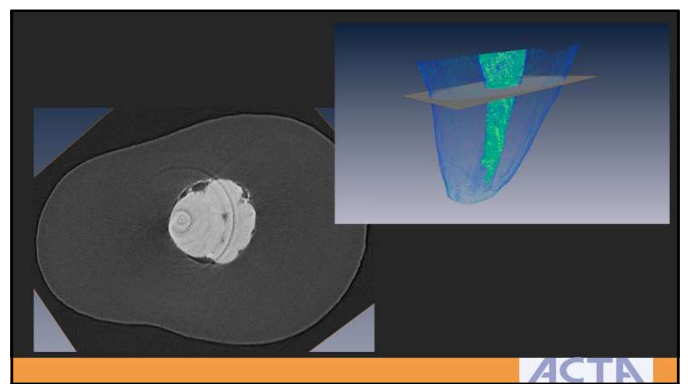
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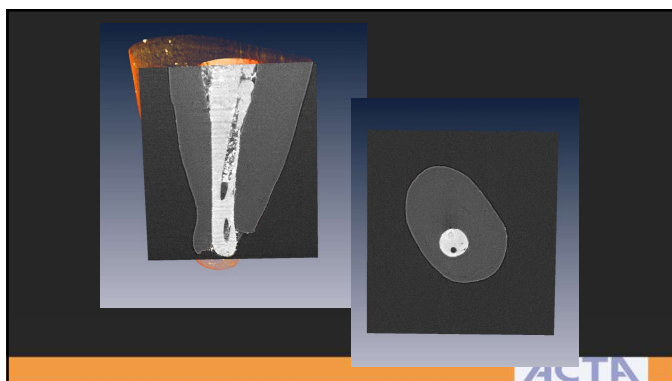
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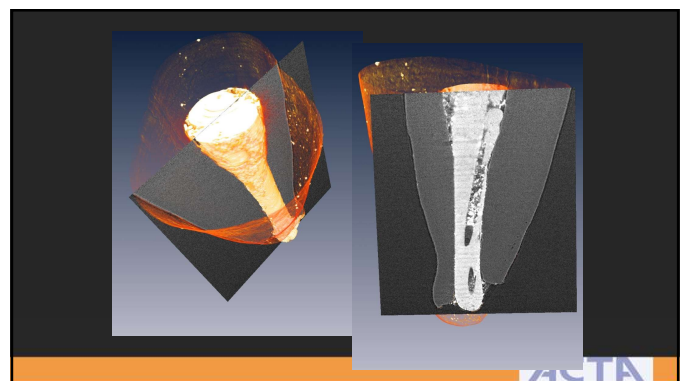
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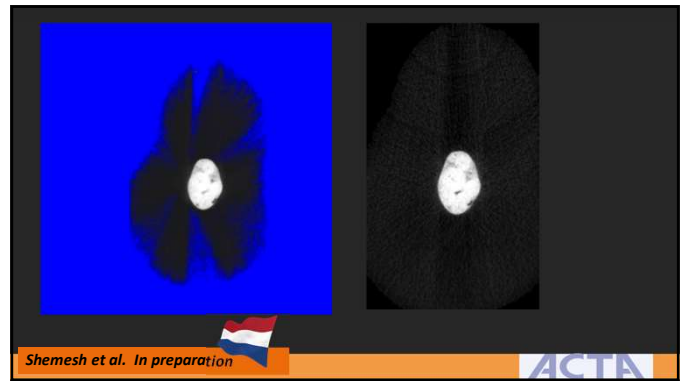
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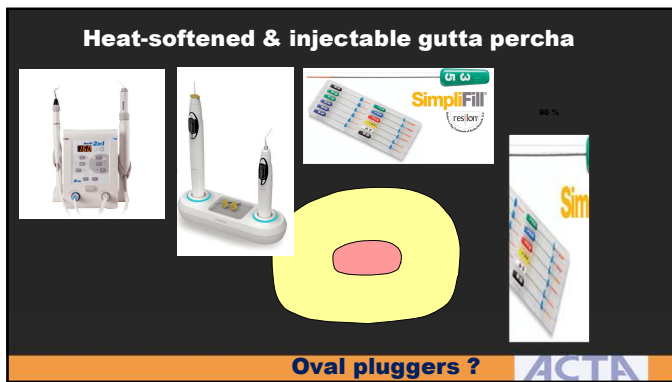
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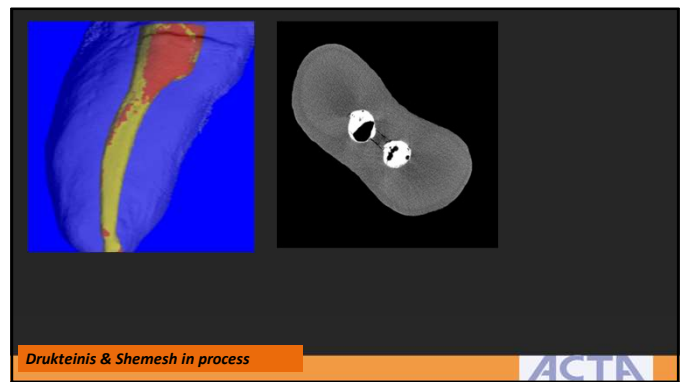
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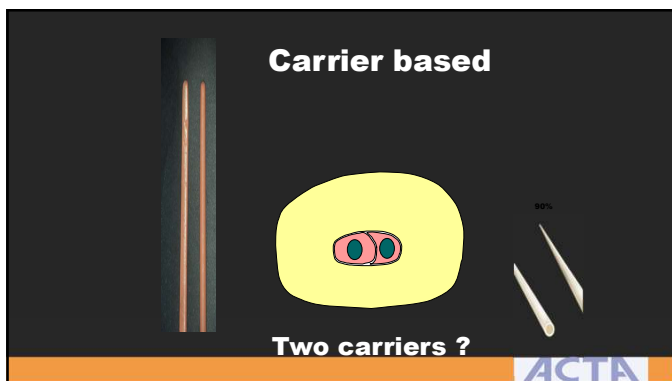
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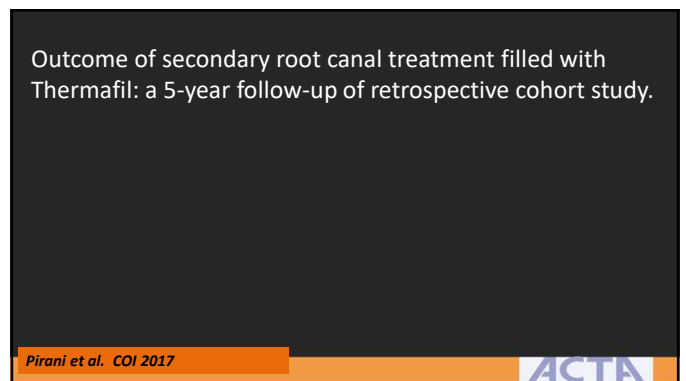
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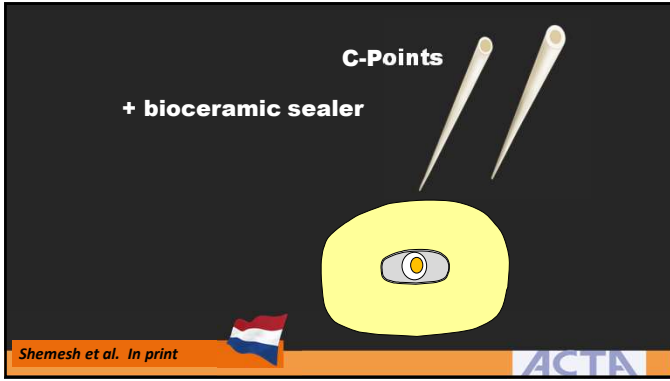
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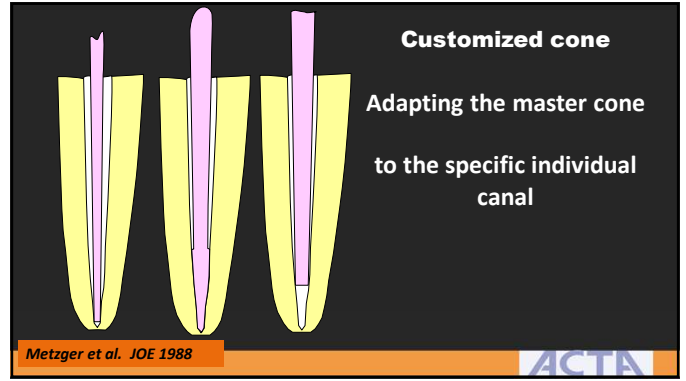
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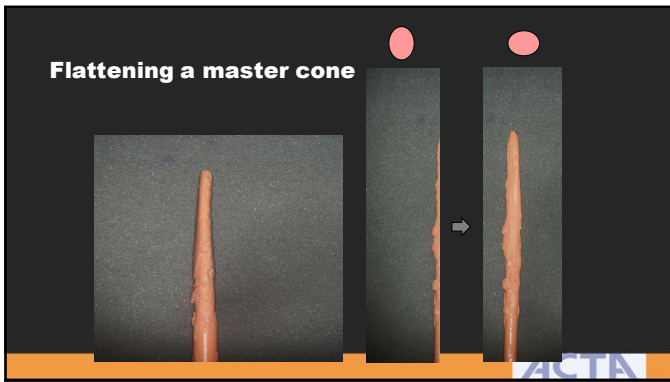
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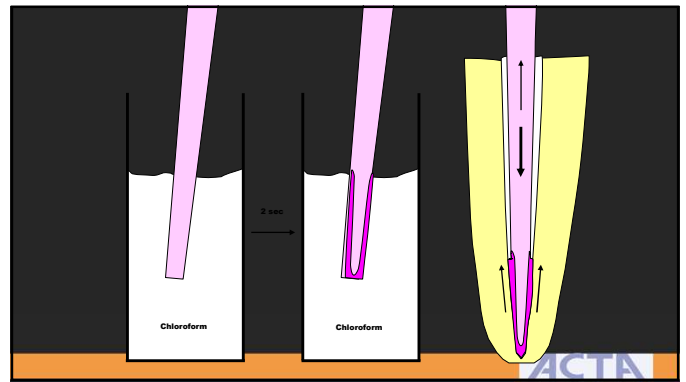
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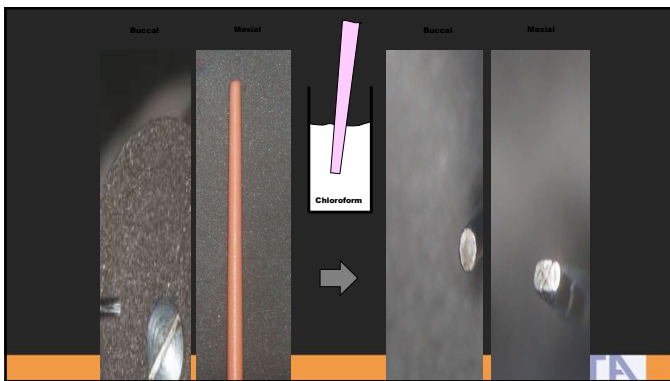
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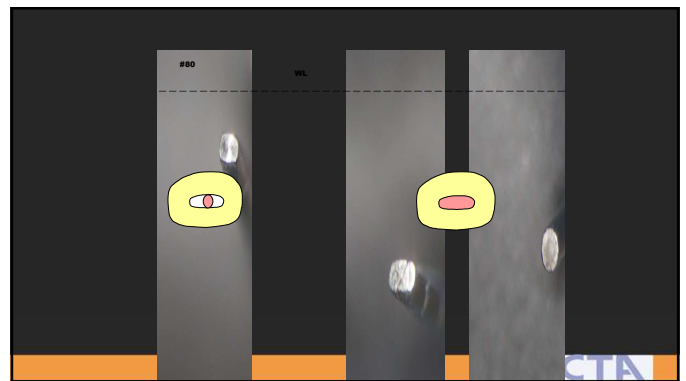
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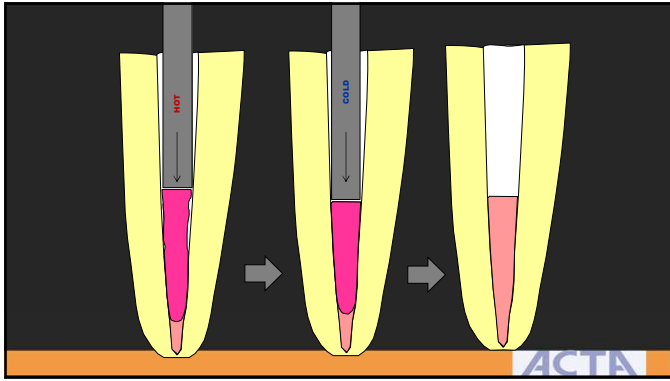
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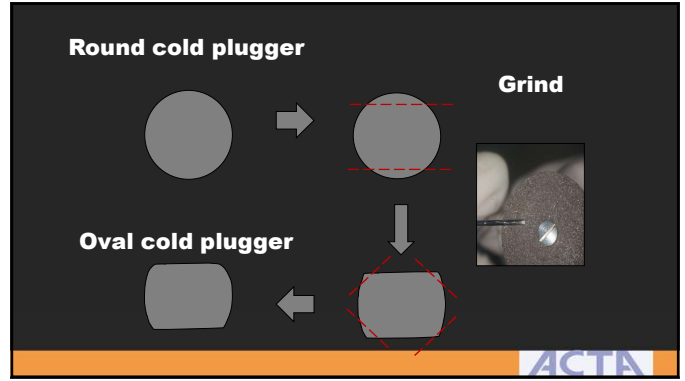
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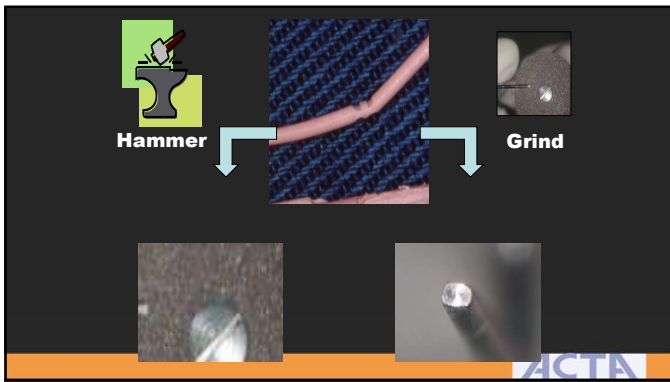
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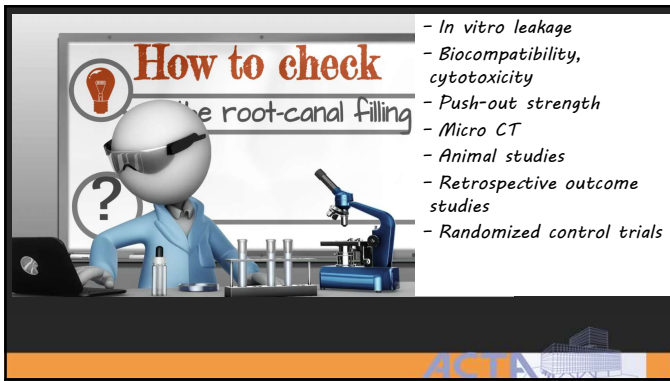
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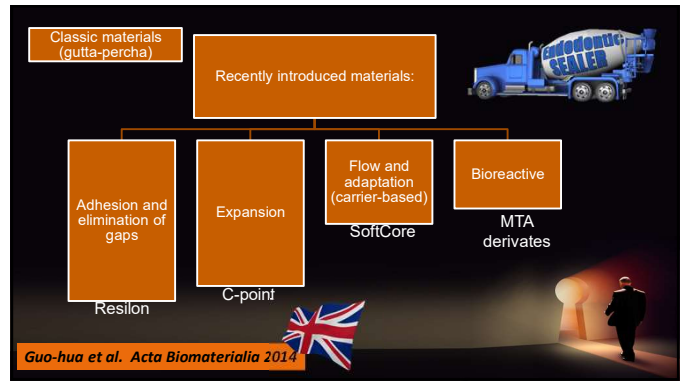
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Outcome

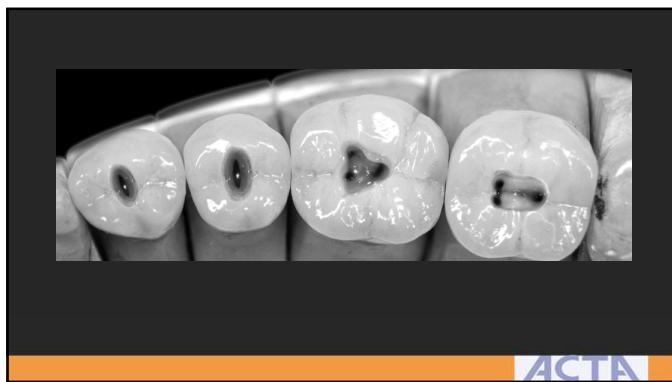
- Very few outcomes study checked the difference between different materials/ sealer.
- Those that did , did not find any difference on outcome between the various materials / methods to fill the canal

$$\text{DISAPPOINTMENT} = \frac{\text{EXPECTATION}}{\text{REALITY}}$$

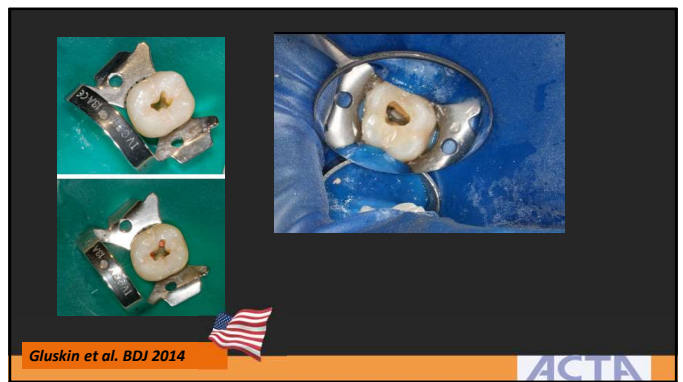
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Ninja access opening- an ultra conservative endodontic opening with minimal dentine removal

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- No finger spreader possible- no lat. Compaction
- No room for customized cone production
- Very difficult to work with flowable gutta-percha
- No room for carrier coated cones
- More suitable for single cone and vertical warm compaction

Traditional

Small

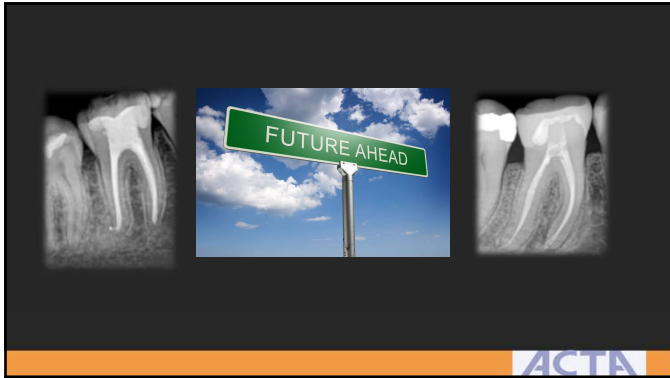
Ninja

Plotino et al. JOE 2017

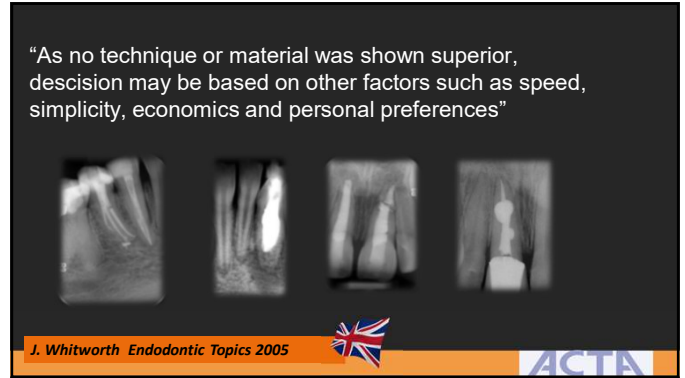
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- The “Ninja opening” limits the filling methods we can use and leave us no other choice than single cone obturation

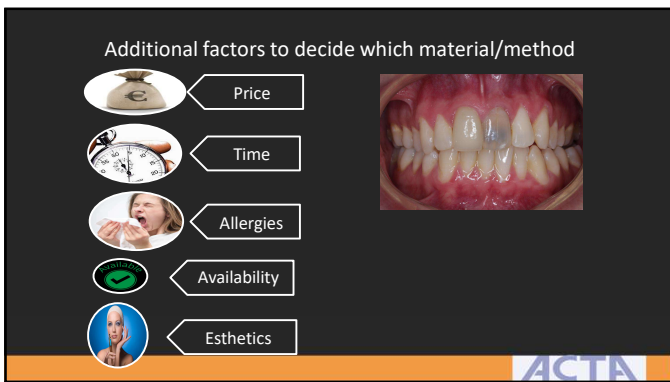
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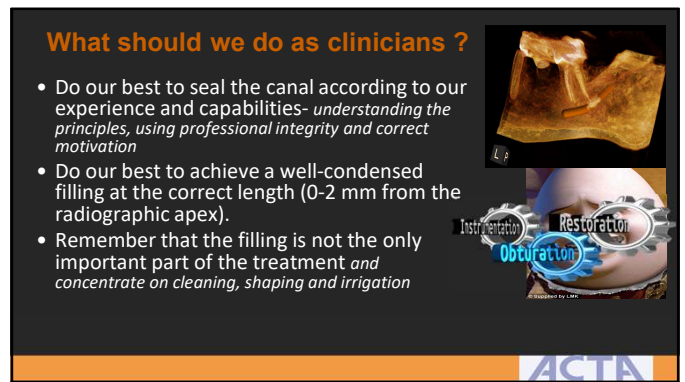
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The commission "root canal filling"

- Undergraduate course in endodontics: which method / material are we going to teach in the future ?



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