BIOLASE®

Laser-Assisted Endodontics

Elevating the Standard of Care and Improving
Patient Outcomes through Laser Technology

Endolase™ RFT (Radial Firing Tip): An Opportunity to Advance Endodontic Treatment…

- Decontamination Studies
  - **Bacteria Penetrates: 1000 µm**

    Kouchi et al 1980
  - **Chemical Irrigants Penetrate: 100µm @ 30 min**

    Berutti et al 1997
  - **Laser Disinfection Penetrates: 1000µm @ 3 min**

    Moritz et al 2000

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RESEARCH | ADVANCES IN DENTAL PRODUCTS

The antimicrobial efficacy of the erbium, chromium:yttrium–scandium–gallium–garnet laser with radial emitting tips on root canal dentin walls infected with *Enterococcus faecalis*

Wanda Gordon, DMD; Vahid A. Atabakhsh, DDS; Fernando Meza, DMD; Aaron Doms, DDS; Roni Nissan, DMD; Ioana Rizoiu, MS; Roy H. Stevens, DDS, MS

One of our goals was to determine if either the chemical disinfection or the laser treatments under specified conditions are capable of a 100 percent reduction in infection. None of the treatment conditions was able to demonstrate such effects. The dry technique at 240 seconds of cumulative laser exposure came the closest to this objective, with a mean residual CFU percentage of 0.29 percent, which was 2.86 times lower than the most effective sodium hypochlorite (3-mL) disinfection. Further studies to evaluate new treatment protocols that could count for completed bacterial eradication need to be considered in the future.

- Samples taken were approximately 200 microns in depth into dentin. Resulted disinfection reduction of 99.71% for E. faecalis

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Endolase™ RFT (Radial Firing Tip): An Opportunity to Advance Endodontic Treatment…

- Unique beam pattern will not fire directly into apex
- Increases penetration of canal wall by laser energy

YSGG Laser Energy

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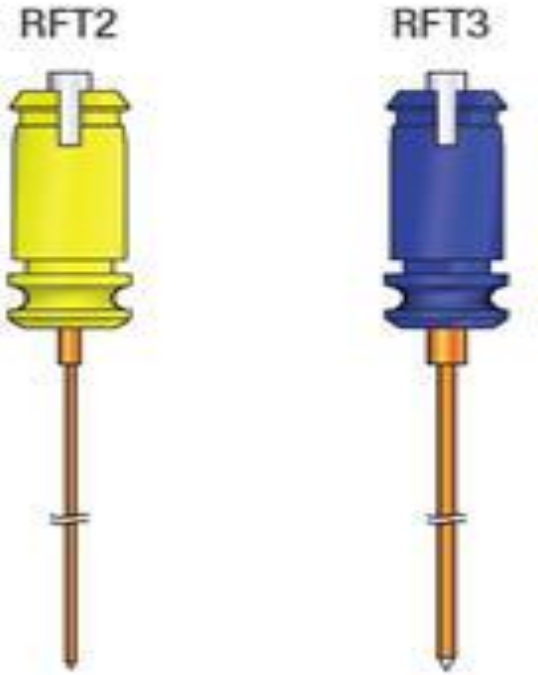
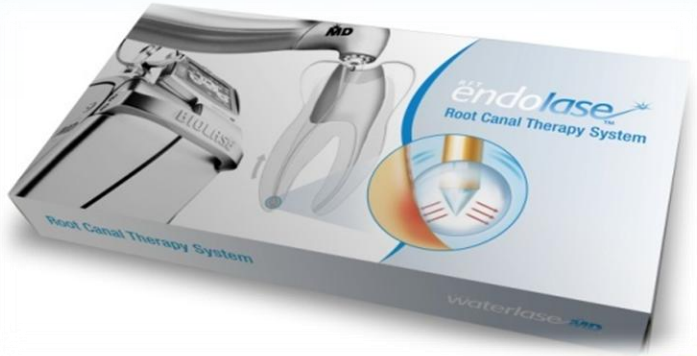
Endolase™ RFT (Radial Firing Tip): An Opportunity to Advance Endodontic Treatment…



- 200 and 300 micron fiber width
- Highly flexible to follow root
- Requires minimal canal widening



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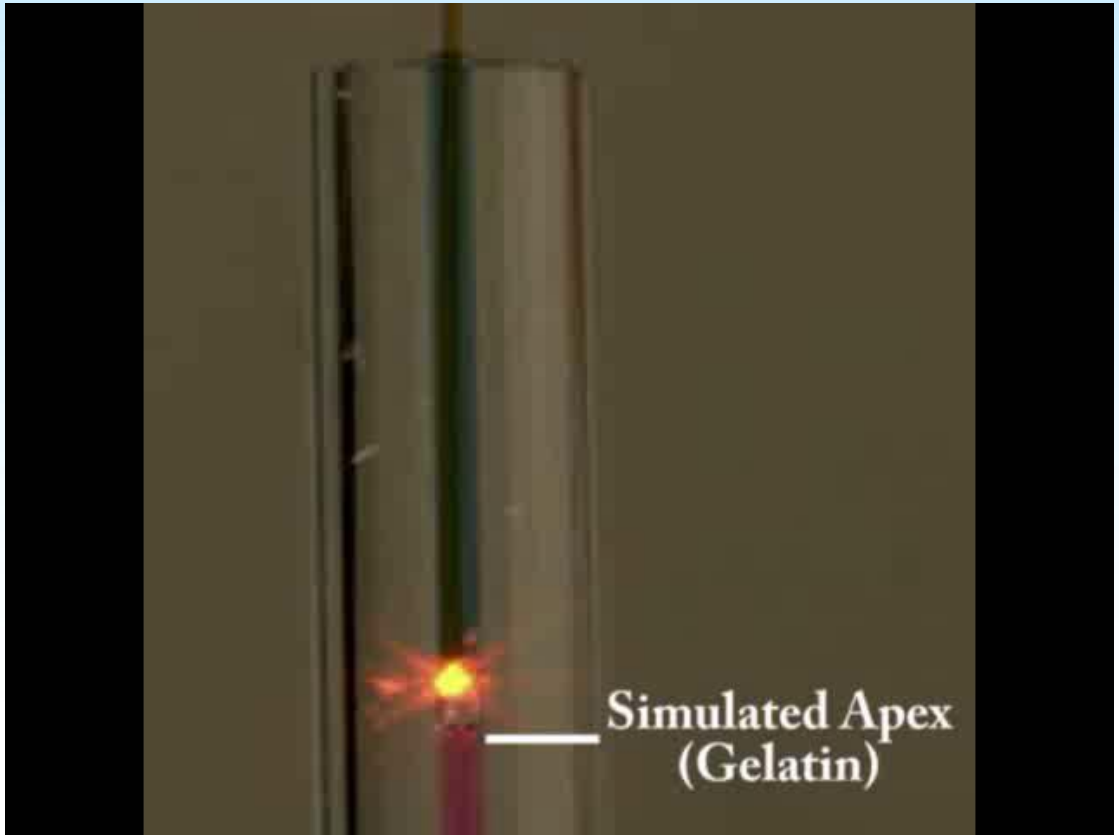
Endolase RFT Safe at Apex…



- No movement or damage at simulated apex with the laser activated, suggesting the RFT can be used safely close to the apex

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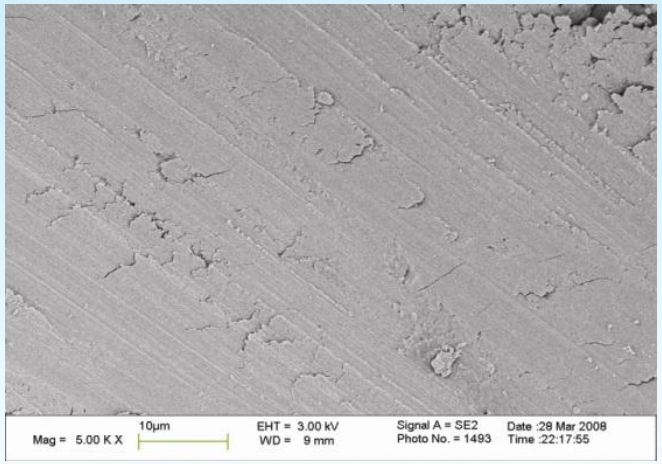
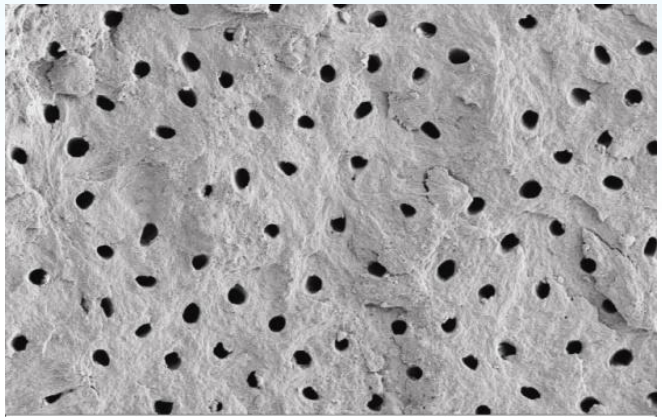
Waterlase Treatment Removes Infection-harboring Instrument Smear Layer…



Instrumentation smear layer containing infected tissue can seal infection within dentinal tubules



SEM showing canal wall free of smear layer after treatment with Waterlase™ MD radial firing tips

California Institute of Technology

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Endolase™ RFT (Radial Firing Tip)…

Courtesy: Dr. Howard Golan

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Endolase™ RFT (Radial Firing Tip): An Opportunity to Advance Endodontic Treatment…

- Advantages

  - Efficient removal of pulpal tissue
  - Removal of smear layer
  - Reduced need for chemical irrigants
  - Reduce bacterial pathogens
  - Open dentinal tubules for better sealer penetration and accessory canal obturation
  - Reduced post-op pain

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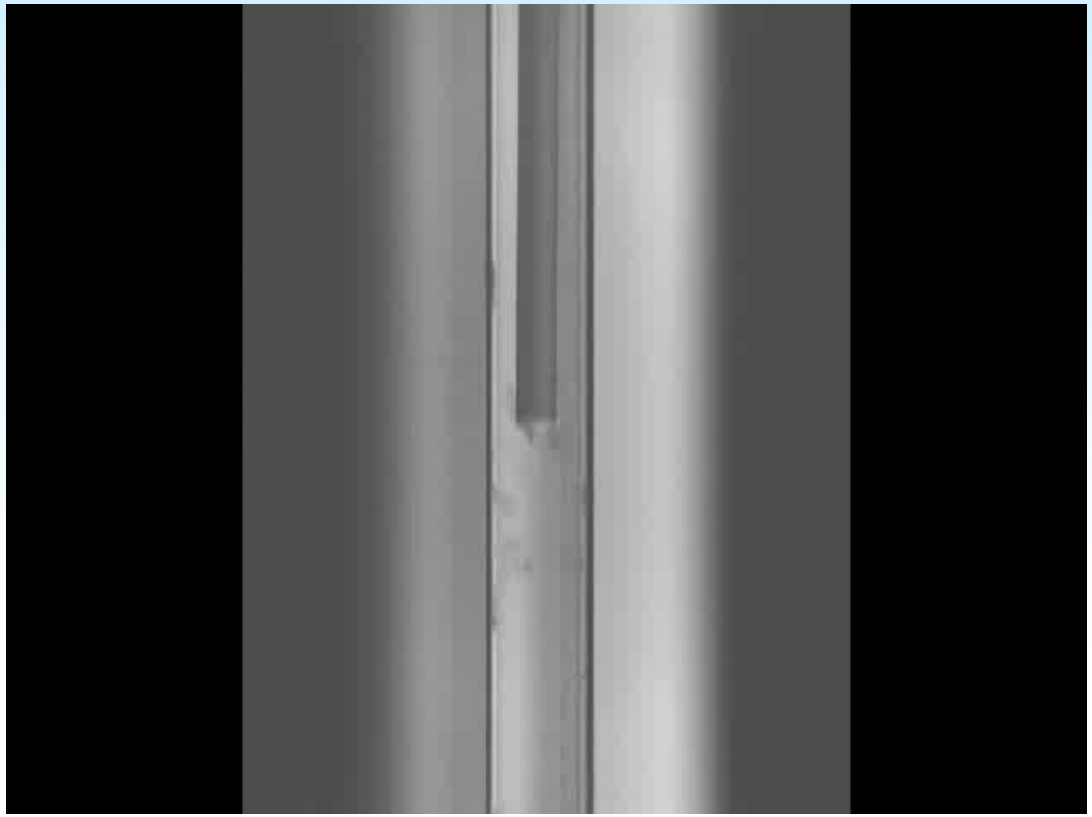
YSGG Laser “Microagitation” Cleaning…



- Exchange of fluid from top of canal to apex
- New fluid is drawn into canal by negative pressure of bubble collapse while old fluid is expelled by expansion cycle of bubble formation

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Open Tubules Allow YSGG Laser Energy to Penetrate Dentin & Destroy Bacteria…

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Detail of contaminant-free tubules after 2-3 min. Waterlase™ YSGG treatment

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YSGG Laser Irrigation of Canal…

- Blue dye indicates debris in the canal
- A few seconds after the laser switched on, debris in the canal is irrigated thoroughly by the action of the YSGG laser energy

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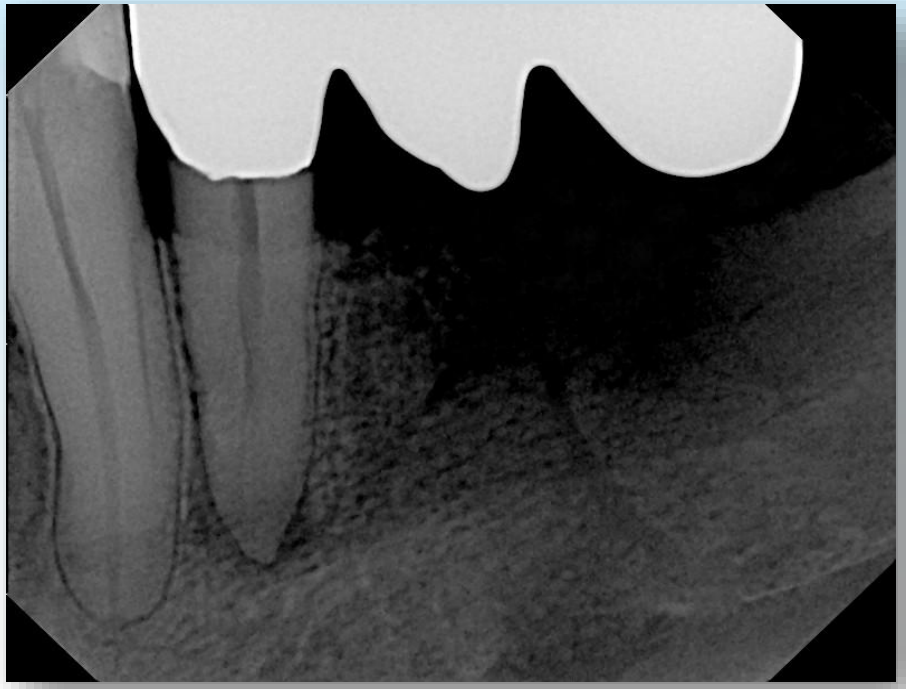
Clinical Cases…



Courtesy: Dr. Darrell Chun

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Clinical Cases…

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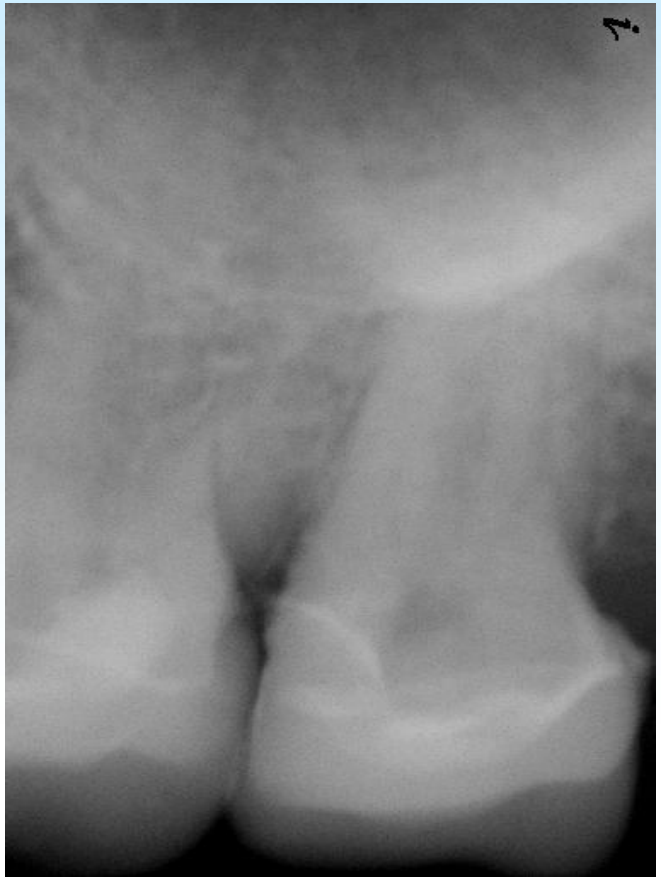
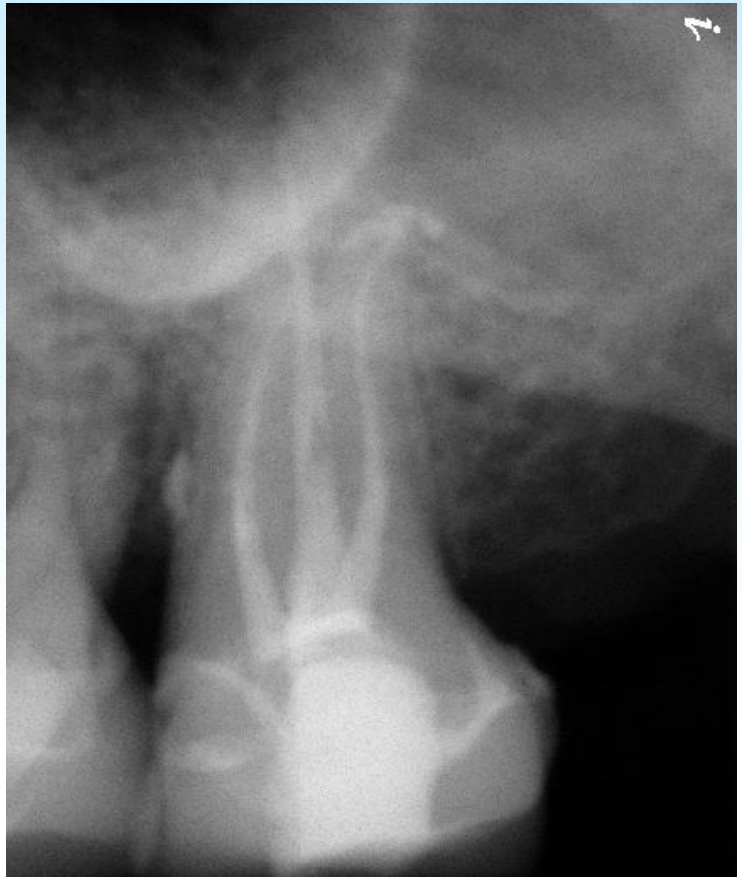
Clinical Cases…





Courtesy: Dr. Darrell Chun

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