



Universitet Sv. Kiril & Metodij  
Skopje R. Macedonia  
Faculty of Dentistry



Department of Cariology & Endodontology

# OUR EXPERIENCE WITH THE ND: YAG LASER IN THE THERAPY

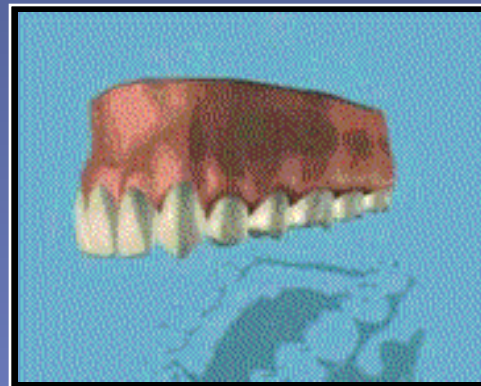
## OF THE CHRONIC APICAL LESIONS

*KOVACEVSKA I., Georgiev Z., Dimova C., Mitevski A.*

# *endodontic therapy procedures:*

endodontic therapy procedures:

- ⇒ enlargement of the root canal
- ⇒ removal of infected tissue
- ⇒ disinfection of the root canal
- ⇒ root canal filling
- ⇒ coronal restoration



## *conventional procedures of root canal preparation - disadvantages*

- ❗ debris removal and disinfection is usually very difficult
- ❗ the canal's surface area remains covered by a smear layer, which protects bacteria
- ❗ intra-canal medicines have a limited anti-bacterial spectrum
- ❗ the conventional, mechanical removal of obturation materials is time-consuming

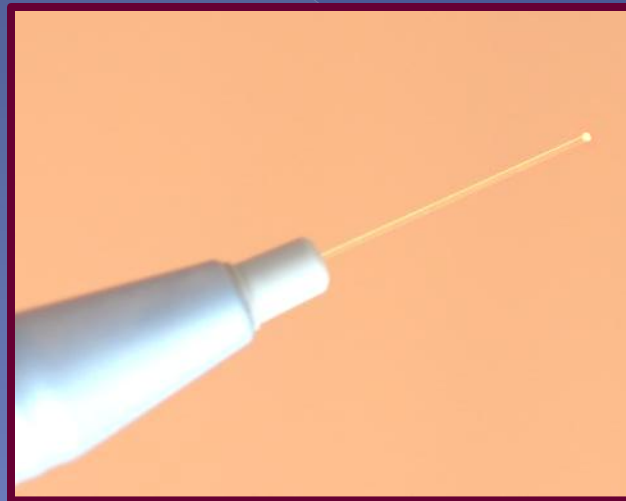
## *dental lasers are use:*

- ✓ pulpotomy procedures
- ✓ removal of smear layers
- ✓ root canal sterilization
- ✓ closing dentin tubule openings
- ✓ endodontic retreatments
- ✓ thermoplasticize gutta-percha
- ✓ obturate the root canal system



# *Nd: YAG - neodymium: yttrium- aluminium-garnet laser*

The primary use of lasers in endodontics is focused on eradicating micro-organisms in the root canal, especially in the lateral dentinal tubules



**Nd: YAG - neodymium: yttrium-aluminium-garnet laser**

***Nd:YAG lasers show the best results in transmission and microorganism reduction measurements. Even at penetration depths exceeding 1.000  $\mu\text{m}$ , 85 % reduction is achieved (Gutknecht).***

***Given the characteristics of laser light (i.e. monochromatic, coherent and directional) and the fact that direct contact between target and fibre tip is not required, emission of laser energy could represent a way to disinfect areas deep within the dentine (Brown).***



**Nd: YAG - neodymium: yttrium-aluminium-garnet laser**

*The aim in this study was to present our experience clinical and radiographic with pulsed Nd: YAG Laser in the conservative endodontic therapy of chronically periapical disease.*

**Nd: YAG diode optical handpieces  
( 1064nm, 300µm, 1,5W, 15Hz)  
*Fidelis III***



*Nd: YAG - neodymium: yttrium-aluminium-garnet laser*

## **STUDY DESIGN**

- ➔ *single-rooted human teeth with X-ray determined periapical radiolucency*
- ➔ *most of them had acute symptoms, characteristic for the exacerbation stadium*
- ➔ *the teeth were opened, the contents of the canals were removed and achieved drainage*

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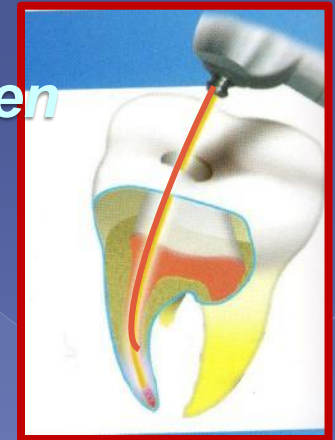




**Nd: YAG - neodymium: yttrium-aluminium-garnet laser**  
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## **STUDY DESIGN**

- ➔ **the working length was established with a #10K file at 1mm from the apex**
- ➔ **crown-down technique for root canal instrumentation**
- ➔ **#40K, or #45K file depending on the canal's magnitude**
- ➔ **2 ml 1% sodium hypochlorite was used between each file change**
- ➔ **final irrigation with 10 ml of distilled water**
- ➔ **partially dried with paper points**



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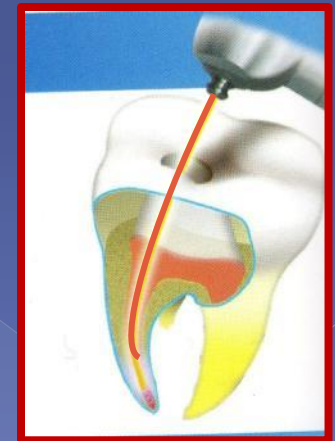
## **STUDY DESIGN**

**⇒ the optic fiber, 300 $\mu$ m wide, from the pulsed Nd YAG laser was set in each canal and laser radiation with circular slow motions from the apex to the crown was applied 3 times, each period of 5 seconds**

**Nd: YAG diode optical handpieces**

**( 1064nm, 300 $\mu$ m, 1,5W, 15Hz)**

**Fidelis III**

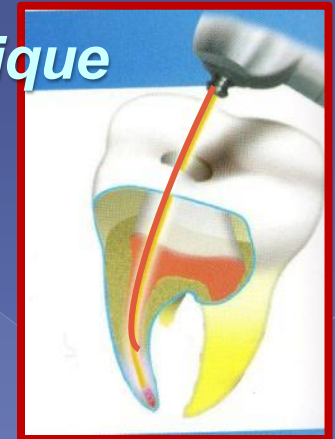


*Nd: YAG - neodymium: yttrium-aluminium-garnet laser*

## **STUDY DESIGN**

- ➔ *after the treatment the teeth were obturated temporarily*
- ➔ *3-5 days later the laser procedure was repeated*
- ➔ *the root canals were obturated with medicament  $\text{Ca(OH)}_2$*
- ➔ *sealers AH Plus or GC Fuji 1*
- ➔ *thermafil or conventional guttapercha technique*
- ➔ *coronary restauration*

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Fidelis III*



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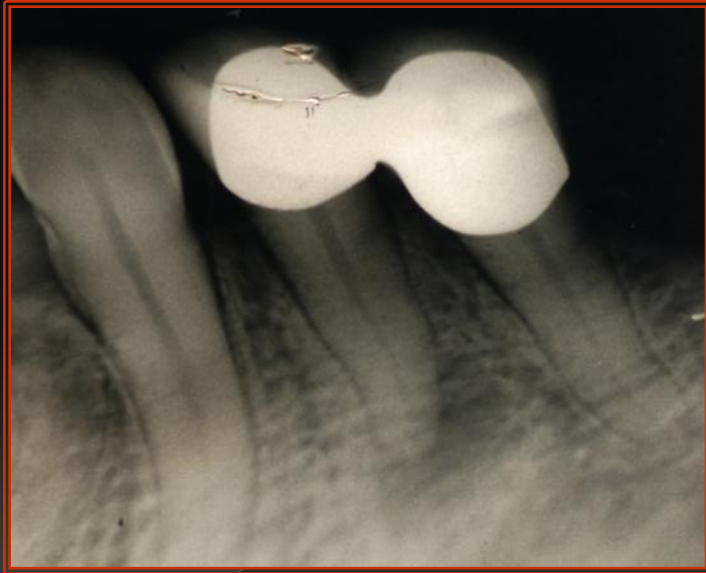


**Nd: YAG - neodymium: yttrium-aluminium-garnet laser**

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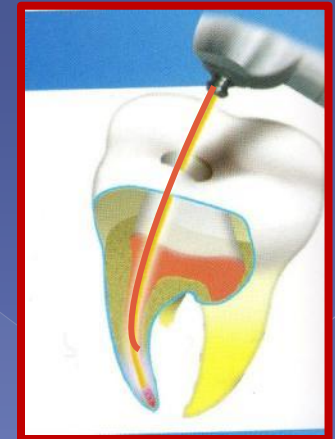
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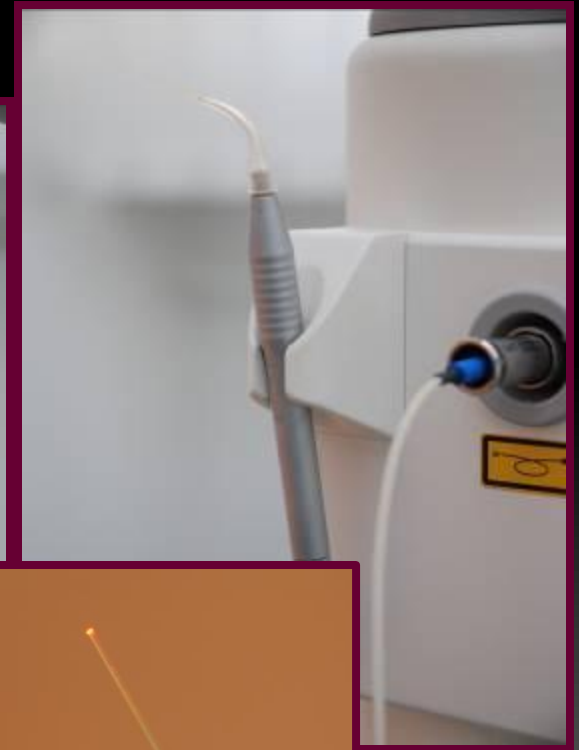
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## **CONCLUSION**

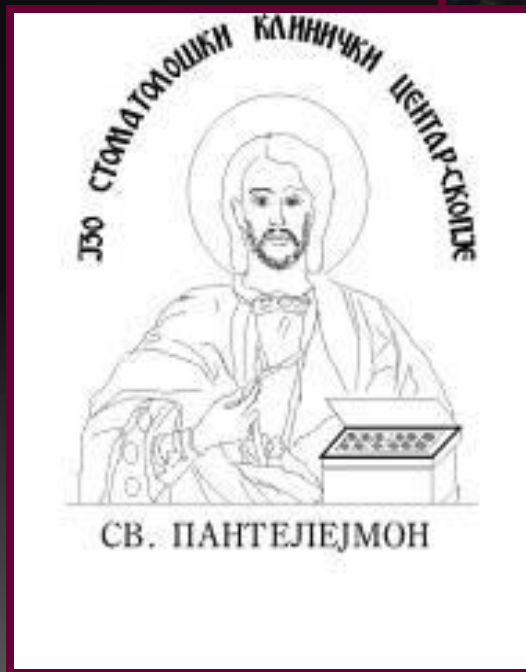
- *Nd YAG pulsed manual laser is successful in the therapy of the chronic parodontites*
- *the length of the endodontic treatment is shorter, especially with infected root canals*
- *the laser therapy with Nd YAG laser calms the subjective symptoms and the clinical signs*
- *the patients did not feel any symptoms*



# Nd: YAG - neodymium: yttrium-aluminium-garnet laser



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