Er:YAG laser in minimal-invasive dentistry. A clinical study.

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AIM OF THE STUDY

The aim of these clinical evaluations was to assess the ability of an Er:YAG laser in micro-invasive dentistry treatment steps (children's permanent teeth) .
Observations regard:-
- discoloration treatments (tooth bleaching)
- micro-invasive treatments (tunnels and Class I, III, IV cavities)
-pit and fissure sealants,

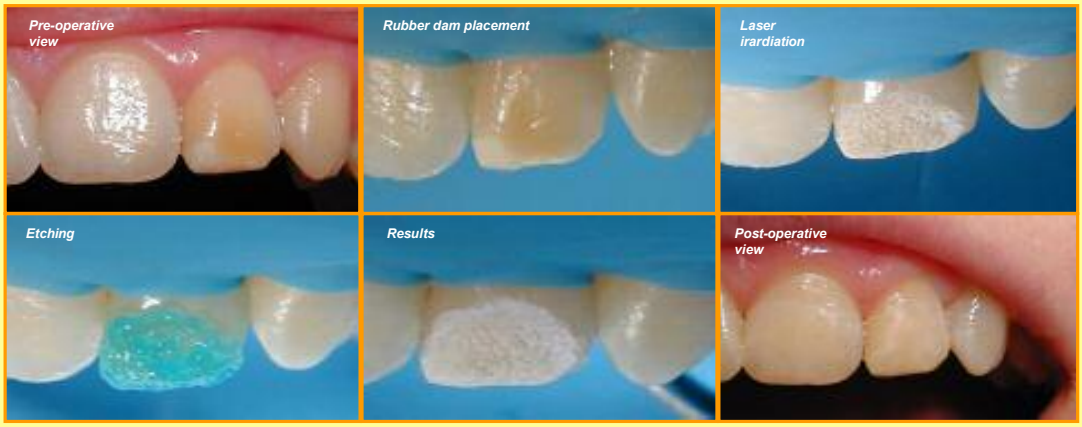
Minimal and sharp enamel abrasion using very low frequencies is easy to obtain (Curti M. et al., J. Clin. Laser. Med. Surg. 2003).
In aesthetical zones it's possible to design a bevel in order to improve adhesion and the aesthetical situation (*Adams et al., Dent Clin North Am. 2004).*
Er-YAG Laser irradiation does not eliminate the need for total acid etching (enamel plus dentine) prior placement of a bonded composite resin (*Bertrand et al., Lasers Surg Med, 2004).* and/or a pit-and-fissure sealant (*Borsati et al., J Dent Child 2004.; Lupi-Pegurier et al., J Dent Child 2003).*
The working times are very similar to the ones related to the burs technique.(*Dostolova et al., J Clin Laser Med. Surg. 1998).*

Main advantages are:
- Absence of vibration;
- No risks for pulp thermal damages;
- Decontamination of the treated zone;
- Different way of dealing with patients especially children (*Kotlow et al., Dent. Clin. North Am. 2004).*

CLINICAL REPORT

Er:YAG laser Fidelis Plus™ (Fotona, Slovenia) – Air water spray (16 / 20)

Discoloration



- Energy: 250 mJ.
- Frequency: 15 Hz.
- Handpiece: sapphire tip.

- Theoretical Power Density: 750 W/cm².
- Theoretical Fluence: 50 J/cm².
- Number of photons/pulse: 370 x $10^{16.}$

Tunnel and occlusal cavities

Pits and fissure treatment

- Energy: 200 mJ.
- Frequency: 8 Hz.
- Handpiece: sapphire tip.
- Pulse duration (SSP): 63 µsec.
- Theoretical Power Density: 320 W/cm².
- Theoretical Fluence: 40 J/cm² .
- Number of photons/pulse: 302 x $10^{16.}$