

Shear Bond Strength - New Reports

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To The Editor,

I read with interest, the article by Kakodkar et al., [1] published in the May 2012 issue of Journal of Clinical and Diagnostic Research, titled "Lasers in Conservative Dentistry: An Overview". The authors made a review of lasers using in conservative dentistry.

The key factor for preparing highly adhesive surface in an enamel and a dentin by use of Er:YAG lasers are: type of laser (Gaussian distribution of energy), short laser pulses duration, low power of laser beam, fluid pumping technology (fluid pressure), time of emission of a laser beam, type of laser tip [2]. Er: YAG laser without optic fibre and with rectangular energy distribution profile, generate high power, uniform as regards the beam and with low energy losses during transport. In most of the presently used lasers, the energy beam is transported to the tip by means of an optic fibre, which distorts the energy distribution. In such lasers, the highest energy is located only in the middle of the beam and it is much lower at the edges. Concentration of the beam power in the very centre (older technology) with relatively low power and high frequency settings may cause thermal damage in the hard tissue [2]. A new laser technology result in reductions of Er: YAG laser defects; for example: overheating of the tooth, melting of hydroxyapatite and lower adhesion of dental materials to a tooth [2,3].

As authors pointed out, the adhesion of the dental hard tissue after an Er:YAG laser etching is inferior to that which is obtained after 37% phosphoric acid etching. However, a laser technology is still developing and recently new research shows different results of shear bond strength (SBS) of enamel and dentin etched by laser. Sagir et al., shows that the mean SBS values of laser-etched group

was significantly higher ($p < 0.01$) than the acid-etched group for enamel [4]. Frank et al., shows that additional laser conditioning after phosphoric acid etch is beneficial to one generation of bonding resin [5].

ADVANCE IN KNOWLEDGE

It is strongly recommended to take into account a type of laser which is use in a science research (type of Gaussian distribution of energy profile).

Technical parameters of a laser beam:

- pulse duration and power of a beam:
- proper fluid pressure to avoid overheating a tissue and to prepare a highly adhesive surface.
- type of laser tip, distance to the target.

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