

Dr. Fornaini is a highly accomplished laser dentistry practitioner, researcher and lecturer. In his private practice in Fiorenzuola d'Arda he has a particular affinity for working with pediatric patients. The benefits of the use of laser are particularly highlighted in pediatric dentistry.

For over a decade, he has worked with Fotona laser systems both in practice and in research.



## Tooth Restoration – A Pediatric Case to Demonstrate the Benefits of Using Two Complementary Wavelengths

**Carlo Fornaini, MD, DDS, MSc., Professor in Lasers in Medicine**

A fourteen-year old patient came to our office presenting a traumatic crown fracture of the permanent, right central incisor. This case study describes how we made use of two complementary wavelength lasers to successfully restore the tooth with a minimum of additional trauma for the patient.

Any dental office frequently sees pediatric patients with traumatic lesions to the upper incisors. Thankfully parents are well-informed through the media and the avulsed fragment will often be preserved in the proper way. In our case the patient came to us immediately after the traumatic incident with the avulsed tooth fragment kept in milk which provided adequate preservation. This enabled us to consider immediate restoration knowing that the rehabilitative bonding would have a good prognosis both from a functional and aesthetic viewpoint.

To lessen the ordeal for the already traumatized young patient we decided to treat and benefit from the Er:YAG and Nd:YAG lasers we have at hand in our practice in the Fidelis laser system. The trauma had left the pulp exposed; our first decision was to perform a Nd:YAG laser pulp capping. We then proceeded to use the Er:YAG laser to prepare both bonding surfaces. The surfaces were further prepared with orthophosphoric acid, we applied bonding and subsequently flow composite resin. The Er:YAG laser played a pivotal role in this particular case; we were able to work without causing any additional pain to the patient, keeping trauma for both patient and parents to an absolute minimum. In addition, the Er:YAG's inherent laser action provided decontamination and it increased bond strength. For aesthetic purposes we prepared the borderline area surface with Er:YAG before one more applying orthophosphoric acid and finally flow composite resin. No form of anesthesia was deemed required by us or even requested by the patient.

The tooth was checked monthly for six months and vitality tests were found positive.

Having the Er:YAG and Nd:YAG lasers at hand in a single laser system is of instrumental importance to us in our daily practice. This case demonstrates how their complementary action can be used very efficiently in procedures. Being able to use both lasers without any time delay was very important in this case as it made the treatment fast and less traumatic for the patient, which is paramount in pediatric cases. From a therapeutic and clinical results perspective, we were able to make decisions fast, knowing that the inherent capabilities of the lasers and the system would lead to good results.

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	Pulp capping	Surface preparation
Laser source:	Nd:YAG (1064 nm)	Er:YAG (2940 nm)
VSP Mode:	SP	SSP
Power/Energy:	4 W	200 mJ
Frequency:	40 Hz	10 Hz
Handpiece:	R21, 300 µm fiber	R02, tipless handpiece



Before



Pulp capping



Avulsed surface preparation



After



Initial bond completed



Bond after Er:YAG surface preparation.

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