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Study Highlight: Cerec Inlays Prepared with Er:YAG Laser – A Fall Study

Dr. Thorsten Kuypers, DMD, holds a Masters degree in Lasers in Dentistry from the AALZ (Aachen, Germany). He has made numerous domestic and international presentations on lasers in dentistry and has published a number of papers on the topic in both domestic and international publications. Dr. Kuypers is associated with the AALZ and German Society for Laser Dentistry.
He co-runs a dental laser clinic in Cologne, Germany;¸
(Source: www.laserzahnarzt-koeln.de)

Modern dentistry, with its wide choice of filling materials, drills, laser and other technologies, offers many “drill and fill” options. Laser-prepared Cerec inlays are a unique opportunity to expand caries treatment options in a technically advanced and modern practice. The highlighted study, conducted by Dr. Thorsten Kuypers, DMD, and published in the German journal LaserZahnheilkunde, describes the combination of Er:YAG laser procedures and Cerec inlays in practice and highlights its advantages for both patients and practitioners.

The advantages of laser-prepared Cerec inlays for patients are obvious: pleasant treatments often performed without anesthesia, immediate fitting of a high-quality inlay and high comfort levels that lead to high patient acceptance. Advantages for the dentist include that this otherwise relatively complex procedure can be performed in acceptable time. Surface-conditioning of a laser-prepared tooth can be performed optically and with the latest Cerec 3D-devices an extremely correct fit to laser-prepared cavity can be achieved. This high-tech treatment provides any practice a modern, high tech image and competitive advantage.

The study describes the case of a 37 year old female patient with a faulty composite filling and cavities in tooth 45. Preserving the tooth was the major treatment goal. It was decided that the best treatment option would be a "chairside" manufactured and laser-prepared Cerec inlay. The preparation took place exclusively with the Fidelis Plus Er:YAG laser. The composite filling was removed using Er:YAG, VSP mode (100µs), 350 mJ, and 20 Hz with water and air spray. The cavity excavation and the completion of the preparation were performed using SP mode (300µs) with 250 mJ and 15 Hz with water and air spray. Surface conditioning, directly before inlay fitting, was accomplished in SP mode with 120 mJ and 10 Hz with water and air spray. After the cavity preparation, an optical casting with the Cerec 3D-device (Sirona) was performed. The inlay was constructed from a ceramic block "Vita Mark II" (Vita) and after trial fitting, corroding and silanization, the inlay was fitted. In addition to laser conditioning, the tooth was corroded and dried. The inlay was bonded with Dentsply DeTrey XENO III bonding and composite spectrum. Anesthesia was introduced during the treatment since the patient wished an absolute pain-free treatment.
The author noted the complete preservation of the neighboring tooth 46 as a substantial advantage. Studies show that in the majority of the conventional preparations collateral damage to neighboring teeth occurs. This can be avoided with the use of lasers.

The study concludes that the expansion of the indications for dental lasers, beyond conventional filling therapy, integrates itself well into the daily practice. The preparation of a Cerec inlay with Er:YAG lasers, whether "chairside" or not, is practice-suited, modern and when correctly indicated the therapy of choice in the future. For patients, who attach importance to high-quality service and a more pleasant treatment, this procedure represents a very good alternative to classical drilling.

(Source: Dr. Thorsten Kuypers, DMD, “Cerec Inlays Prepared with Er:YAG Laser – A Fall Study”, LaserZahnheilkunde 2006; 3/4/06: 203-206)

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Dr. Julio Lomelli is President of the Venezuelan Academy of Laser Dentistry.
He has performed over 25.000 laser treatments since he pioneered in 1997 with a Fotona laser, being the first Venezuelan laser dentist in his country.

Dr. Lomelli currently owns two Er:YAG and one Nd:YAG Fotona laser systems.

Tooth Hypersensitivity Treatment

Recommended Parameters:

Laser source:	Er:YAG (2940 nm)
VSP Mode:	SP
Pulse energy:	80 - 90 mJ
Frequency:	2 Hz
Handpiece:	R02
Water/Air Spray Setting:	None

Treatment procedure:

- Remove plaque on the affected tooth by gently rubbing the area with wet gauze or a prophylaxis brush.
- To establish a reference sensitivity measure and set a treatment goal, spray air on the affected area (the patient will react) and request that the patient quantifies the pain on a scale from 0 to 10.
- After explaining the procedure to the patient, establish a working distance for the treatment. Hold the handpiece approx. 6 cm from the affected tooth and while emitting the laser move the handpiece slowly from left to right while gradually closing in on the tooth. When the patient starts feeling sensitivity, immediately stop the advance towards the tooth. Move the handpiece slightly away from the tooth (0,5 to 1 cm) so that the patient does not feel overpowering hypersensitivity anymore.
- At the working distance, move the handpiece three times slowly from mesial to distal ends covering the neck area of the tooth and following the contour of the gum. Allow a slight overlap of each shot. Aim the laser beam as closely as possible to the gum border. If gum tissue is touched, it will harm at this low power setting.
- Stop the laser emission and with the patient's mouth closed rub the treated area in order to wet the zone with the patient's own saliva.
- Repeat the previous two steps twice more.
- Have the patient rinse gently with water at body temperature and test with the air spray to determine any decrease in sensitivity. Do not use the air spray at full strength. The process can be repeated 2 more times (3 passes each), after swishing, repeat the air test until no sensitivity is felt.
- If sensitivity remains, the procedure may be repeated after 48 hours in order completely eradicate sensitivity. In some cases the patient may declare to feel no sensitivity because of the dramatic decrease in sensitivity. But one day later the patient may realize that some sensitivity has returned and returns for a final touch-up. The procedure has been 100% effective and lasting on all types of patients with the exception in cases of Taurodontism due to the peculiar anatomy of the teeth.
- Patients must be instructed not to brush for one day, then brush for three days without toothpaste, so the calcium in the saliva will work on the affected area. After the fourth day we can polish using resin polishers in order to eliminate any roughness that may have remained, which can lead to increased adhesion of bacterial plaque.

This laser technique is shown to be extremely effective in treating hypersensitivity, although the etiology (brushing technique or other) must be addressed for a long-lasting result.

(Courtesy of Dr. Julio Lomelli)

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Dr. Kakas is a specialist surgeon in laser rejuvenation, vaginal rejuvenation techniques, laser surgery and body sculpting. He founded the Center of Advanced Plastic Surgery (CAPS) and is the C.E.O. of the Center of Advanced Plastic Surgery in Thessaloniki, Greece. He uses the Fotona XP MAX, Dualis^{XS}, and XP-2 Focus laser systems to perform procedures.

Combined Use of Nd:YAG and Er:YAG in Acute Cystic Acne Treatments – A Case Study

Dr. Paraskevas Kakas, M.D., Ph.D.

Cystic acne is a very unpleasant and painful form of acne and manifests as inflamed pustules filled with pus. The cause of acne cysts is wide-ranging; main causes are hormonal changes or imbalances, and a collection of dirt on the skin that causes inflammation in the pores. It is generally a hereditary condition. In the treatment of acute cystic acne outbreaks it is important to realize that the inflamed cysts are merely symptomatic of a systemic condition. Conventional therapy advises to leave cysts undisturbed as to intensify the inflammation and to avoid developing new cysts by irritating neighboring pores. To alleviate discomfort associated with cystic acne, Dr. Kakas has developed a procedure that combines the Fotona Nd:YAG and Er:YAG lasers. The following case study describes Dr. Kakas' technique.

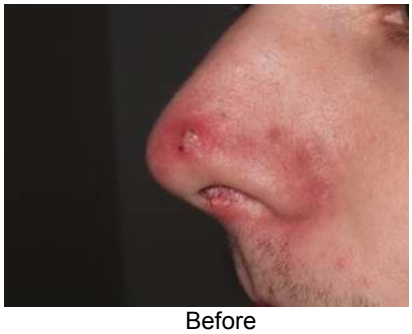
A young male presented with persistent acne and several acutely inflamed acne cysts in the face which caused discomfort. After examination a cyst left side of the nose were found to be indicated for the laser combination treatment. The cyst was swollen, red and palpation indicated that pus build-up was putting significant stress on the upper skin layers; causing pain.

In a first step, Dr. Kakas used the Fotona Nd:YAG laser, with fluence 50 J/cm^2, pulsewidth 35 ms and frequency 1.0 Hz settings and a 6 mm spotsize. These parameters provide disinfection of the general area in and around the cyst, through the laser's thermal effects.

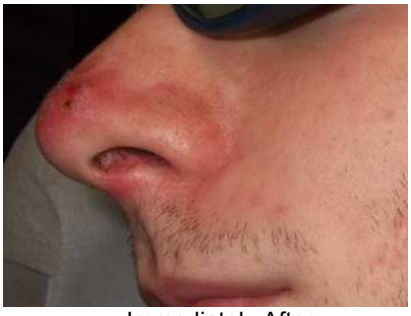
In a second step, the thinnest part of the cyst is located. Using the R08 Er:YAG handpiece and 0.1 J energy, VSP mode and 20 Hz frequency Er:YAG laser settings, Dr. Kakas drills a miniscule hole in the side of the cyst. Almost immediately the pus is expelled from the cyst and pressure on the skin is relieved. With gentle manual pressure pus is further removed from the cyst until blood appears.

In a third step Dr. Kakas uses the Fotona Er:YAG's longer pulse modes' coagulation properties to limit bleeding. For this step the following parameters are selected; 0.2 J energy, XLP mode, 5.0 Hz frequency with the R08 Er:YAG handpiece. In addition to coagulation, the heat generated also provides superficial disinfection, thereby limiting the risk of reoccurrence.

Dr. Kakas has been performing the procedure in several hundred cases without any significant side effects. In this case the patient noticed immediate pain relief. After 24 hours the lesion was less inflamed and after a week the cysts showed no apparent inflammation.



Before



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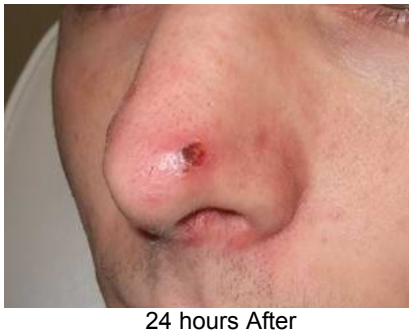
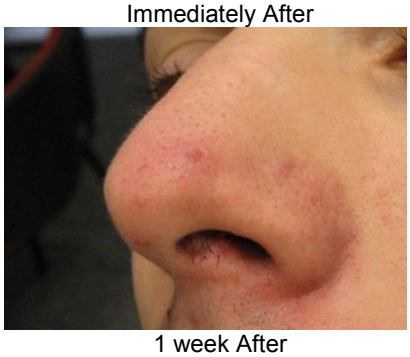


24 hours After



1 week After

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