

YSGG Laser Root Canal Therapy

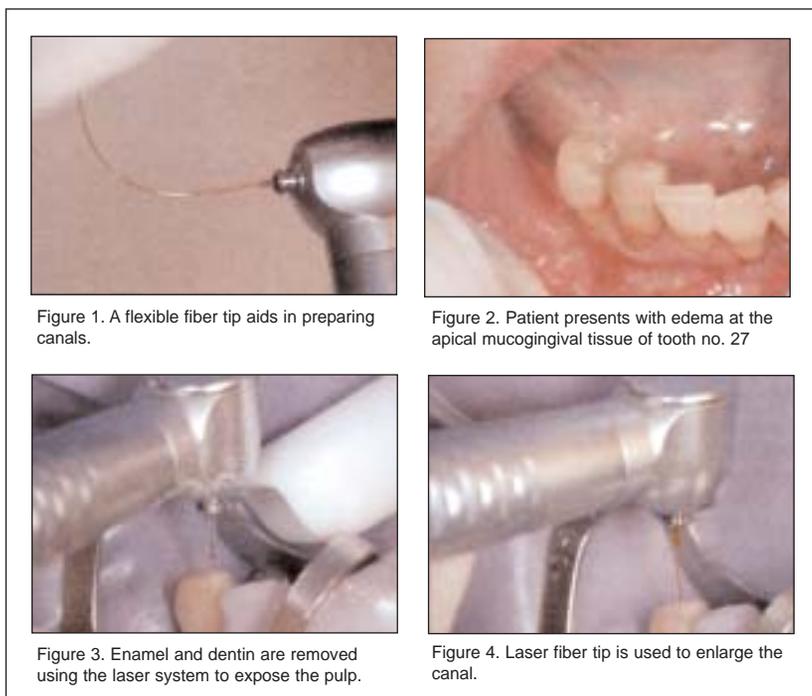


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According to the American Association of Endodontists (AAE), 17 million root canal procedures are performed every year. In a study also conducted by the AAE¹, a high percentage of adults surveyed described the root canal procedure as “painful” or “extremely painful.” In view of these findings, the challenge for dentists is to discover new treatment modalities that are effective and provide better comfort to our patients. Furthermore, we do not want patients to avoid treatment out of fear, because serious complications can-and often do-arise. This can be addressed by providing them with a more gentle therapy.

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Dentistry has now been introduced to a new root canal treatment using the Er,Cr:YSGG (erbium, chromium: yttrium scandium gallium garnet) laser to provide additional important benefits to our patients. This new system should help reduce patient fear and improve their general attitude towards dentistry. The device that provides such a treatment is the Waterlase Hydrokinetic Hard and Soft tissue laser (Biolase Technology, Inc), the only laser system to receive FDA clearance for complete endodontic therapy involving enamel, dentin, pulp, and other root canal procedures. This laser uses specialized fibers of vari-



ous diameters and lengths that provide access to effectively remove pulpal tissues and tooth structure from the root canal walls, and prepared the canal for obturation.

By utilizing the hydrokinetic process, in which water is energized by the YSGG laser photons to cause molecular excitation and localized microexpansions, hard tissues are removed cleanly and precisely with no thermal side effects. The energized particles are able to provide a gentle environment for removing tissue at the target point. High temperature which is a general concern with most laser systems, is not an issue with the Waterlase Hydrokinetic system. Studies have shown that the temperature of the pulpal tissue remains stable or drops approximately 2 C° below the normal temperature when the laser and spray reach the pulpal tissue.² The

Waterlase Hydrokinetic system is already very versatile for both hard and soft tissue applications, and the YSGG laser endodontic application is yet another remarkable innovative discovery for dentistry.

In my practice today, I use the Waterlase Hydrokinetic endodontic system to perform root canal therapy in all anterior teeth and premolars that require root canal treatment. One remarkable finding that convinced me to start using this system in place of the conventional approach was the patients' consistent intraoperative and postoperative comfort levels. This finding parallels the benefits we generally see in YSGG Laser applications in dental surgeries and in tooth and bone procedures.

Initial findings from working with this system on extracted teeth demonstrated that utilizing the thin

and flexible fiber tips (Figure 1) was effective, and I was able to successfully debride, clean, and shape root canals in relatively straight and mildly curved canals. The results of YSGG Laser instrumentation showed that the canal shape established with this method of treatment was similar to the conventional approach. Following is a case report on one of the root canal clinical treatments that I performed using this new laser system.

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CASE REPORT

The patient, a 64-year-old female with good general health, had been complaining about the presence of swelling in the mucogingival area of the mandibular right cuspid. Clinical examination revealed edema at the apical mucogingival tissue of tooth No. 27 (Figure 2). The tooth was asymptomatic and slightly tender under percussion and palpitation. Vitality tests showed that the pulp was nonvital and probably necrotic. The periapical preoperative radiograph revealed that tooth No. 27 had a periapical lesion. Radiolucency around the apex of the tooth was also noted. The diagnosis was periapical abscess of endodontic origin. The treatment plan was root canal therapy using the Waterlase Hydrokinetic system as the modality of choice.

Because the infected tooth was

asymptomatic, I decided to perform the procedure without local anesthesia. Although this particular case was completed without anesthesia, I have used anesthesia in other cases. Further studies will determine how frequently YSGG laser endodontic cases can be performed without anesthesia. Access opening was made using the laser system to remove the enamel and dentin to expose the pulp (Figure 3). The Pulpotomy was performed

at soft tissue settings. The patient did not experience any pain during the access opening and pulpotomy.

To begin, I used small K files to establish the working length. I started the initial preparation with the Waterlase Hydrokinetic system using the thinnest fiber tip at low power settings in combination with an air and water spray. The laser fiber tip was used to enlarge the canal (Fig.4). At the same time, decontamination of the canal was induced by YSGG laser photons. This first procedure was followed by the next size fiber, utilized to further enlarge and clean the canal. The procedure continued until the canal was debrided and cleaned to the working length, enabling a No. 35 K file to reach the apex. The shaping of the canal by the YSGG laser enabled a No. 60 K file to reach the middle third of the canal and to accommodate the gutta-per-

cha points fitting the canal the working length. The canal was then dried with paper points and sealed with sealant and gutta percha.

The patient was very pleased with the treatment and quite surprised to find that there was minimal discomfort throughout the procedure. She was happy to leave the office without the numbness that normally follows mandibular block anesthesia. A prescription for antibiotics and pain medication was given before dismissing the patient. At the 24-hour postoperative telephone interview, the patient informed me that she had no complications such as swelling or discomfort, and that she had no need to use the pain medication.

CONCLUSION

From my experience with the Waterlase Hydrokinetic system on patients, the most important benefit of this revolutionary technology for endodontic treatments is the ease of using the system and the great degree of patient comfort during and after the procedure. Also, I have found a reduced need-and in some cases no need at all-for prescription pain medication. Furthermore, postoperative complications such as inflammation, swelling, and pain were significantly reduced. In addition, the possibility exists that more root canal therapy can be performed without any anesthesia. Also, due to the antibacterial effect of the YSGG laser, it is my opinion that this will lead to a reduction in the need for postoperative antibiotics. All of these factors help to improved patients' attitudes toward dentistry.

REFERENCES

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