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Health

A Painless Root Canal?

[Matthew Herper](#), 03.31.03

Lasers that can cut gum, tooth and bone are ending the despotic rule of the turbine dental drill.

Allen Helfer is no sadist, but he does perform root canals on his dental patients without using anesthesia. Instead of boring into teeth with an excruciating turbine-driven drill, the professor of dentistry at Columbia University's School of Dental & Oral Surgery slices painlessly through gum, tooth and bonewith a laser beam.

A visit to the oral surgeon will always remain low on the list of pleasant things to do, but the days of throbbing jaws and numbed mouths are drawing to a close. Dentistry is painful because drills are messy and hot. Friction builds up between the drill and the tooth, heating up the enamel and causing nerves to flare. A drill's vibrations can also weaken the tooth by creating small cracks and fissures in the tooth's surface.

Dental lasers take away all that trouble. They cut by vaporizing the water molecules inside soft, wet gums. An ingenious new laser called Waterlase adds to that the ability to cut through dry teeth and bone by casting a cloud of hot water vapor around the laser's cutting point, a couple of millimeters from the tooth. The excited water molecules dissipate their energy by bashing against the enamel and bone. Even as the tooth is being cut, it never gets hot, and there is little pain. "It's basically a microexplosion," says Ioana RizoIU, the head of research and clinical development at Biolase Technology, the San Clemente, Calif. company that created the Waterlase.

Some 1,500 Waterlase machines have been sold in the U.S. since it won approval from the Food & Drug Administration in October 1998 for preparing cavities to be filled. Sales have risen steadily since, with Waterlase winning subsequent approvals for root canals in January 2002, bone surgery in February 2002 and root canal complications in February 2003.

Biolase's sales surged 63% to \$29 million last year, helping it turn a \$2.6 million profit, its first. Chief Executive Jeffrey Jones expects sales

to jump at least 40% this year. There are 140,000 dentists in the U.S.; most of them are general practitioners who work alone and still use anesthesia and turbine drills. Biolase's competitors include Lumenis, in Israel, and Hoya ConBio, in Fremont, Calif.

Some dentists will be reluctant to go vibration-free. The \$50,000 price tag on the Waterlase is 33 times that on a high-speed dental drill. But there are compelling reasons to switch. Biolase's Jones says the Waterlase can generate \$1,000 a day as procedures are done more quickly, with less delay for anesthesia and fewer complications. Moreover, the laser, which resembles a dental drill in shape, can do things a dentist would never do with a drill, like cut gums. And the laser cuts gums without causing much bleeding. Switching to the laser cuts the price a consumer pays for cosmetic crown-lengthening, used to make teeth look bigger, from \$7,000 to \$3,000.

Jason Doucette, a 30-year-old cosmetic dentist in Reno, Nev., says he occasionally uses anesthesia with his Waterlase and that the laser is useless on silver fillings, which act like mirrors. But most patients are able to get a cavity repaired without a shot to numb them. Another reason the Waterlase and Biolase's other product, a tooth-whitening laser, appeal to customers is that they sound so high tech. "It's definitely a huge marketing tool," says Doucette.

Pain-free chair time can sell even some of the toughest customers:kids. Barry Jacobson, director of pediatric dentistry at Mount Sinai Hospital in New York, found the "drill" especially helpful for kids who were allergic to anesthesia or were already on drugs that could interact with painkillers. "Kids love it," says Jacobson. "It's a huge advancement in dentistry for children, and I don't think there's any way you can go back."

In fact, Jacobson likes the Waterlase so much that he now has two. "Ultimately," he says, "Every dentist will have one."