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Doctor of Dentistry

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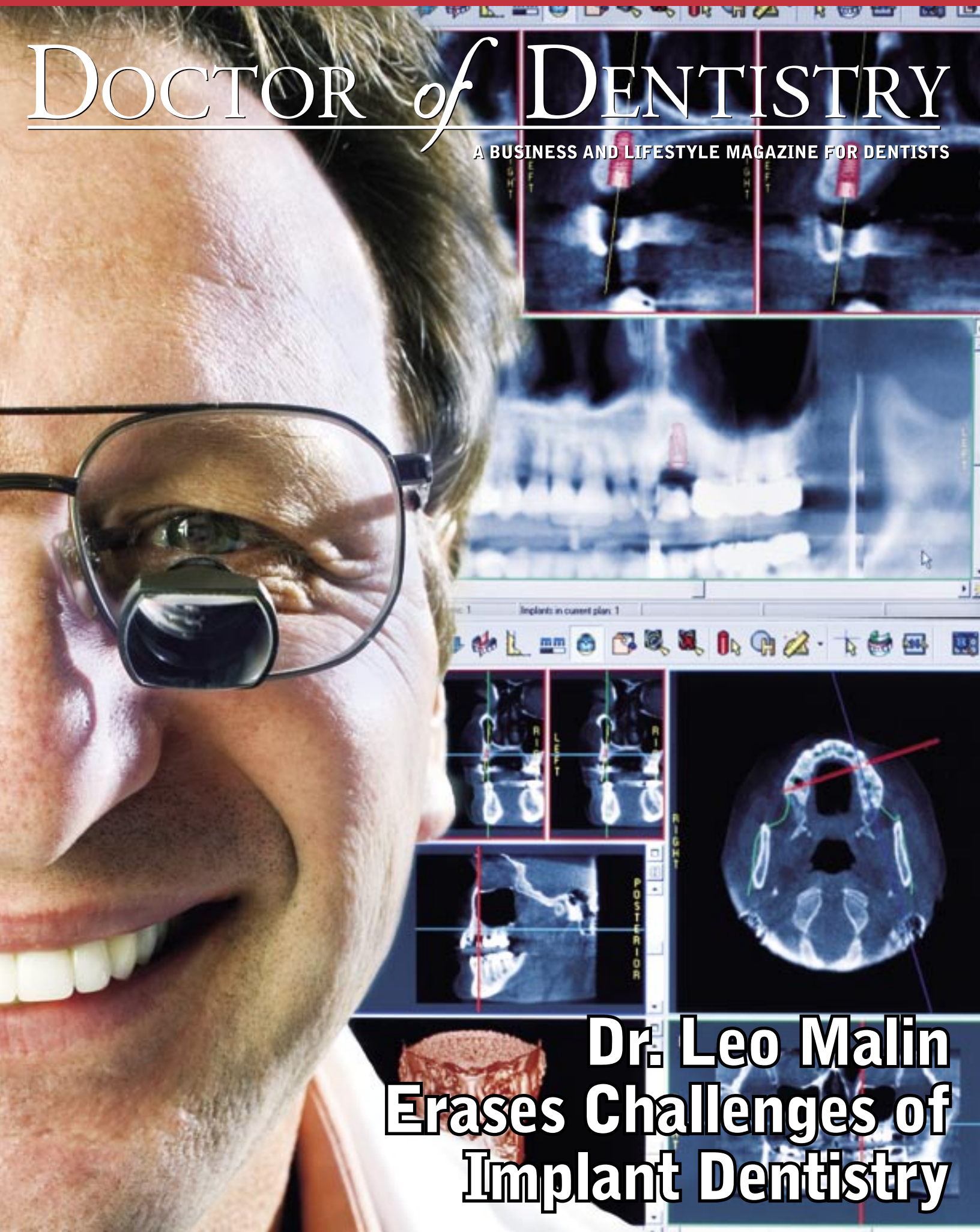

Dr. Leo Malin Erases Challenges of Implant Dentistry

Dr. Leo Malin Brings Cutting-Edge CT Technology Right to Dentists' Doorsteps

By Jeff Ward, Edited by Jeanette Hurt

Where others saw controversy in occlusion and dental implants, Dr. Leo Malin, D.D.S., saw opportunity. Dr. Malin owns the Sparta Dental Center in Sparta, WI, and has pioneered a way to make the placement of dental implants more functional, cosmetically pleasing and predictable while making the implant process controllable for practitioners. He, along with NIS Inc., brings this cutting-edge technology right to the doorsteps of dental offices that use their mobile CT scanner and placement protocols.

"It is a very exciting time to be a dentist and have access to these tools," Malin said. "We can affect implant placement in ways that we couldn't even dream of just 10 years ago."

The recent advances in the rapidly changing dental profession — specifically the changes in CT technology and the current knowledge of occlusal patterns and cosmetics — motivated Dr. Malin to simplify the placement of dental implants with his NIS protocol and related technologies. Professionals in dentistry are now predicting that the use of CT technology will become the gold standard for dental implant placement. "It's currently not the dental standard for implant placement, but soon it will be," Dr. Malin said.

Dr. Malin has already implemented this CT standard into his practice. "It has been my mission to share this complete implant placement protocol with other dentists," Dr. Malin pointed out. Over the past few years, he has actively brought CT technology and the NIS protocol to dentists throughout the nation and abroad with his implant lectures and live surgical training courses.

"My twin goals are to make CT technology more available with reasonable prices to every doctor who wishes to use it and to spread the message of using CTs to guide the precise placement of dental

One of the mobile CT units employed by NIS Inc.

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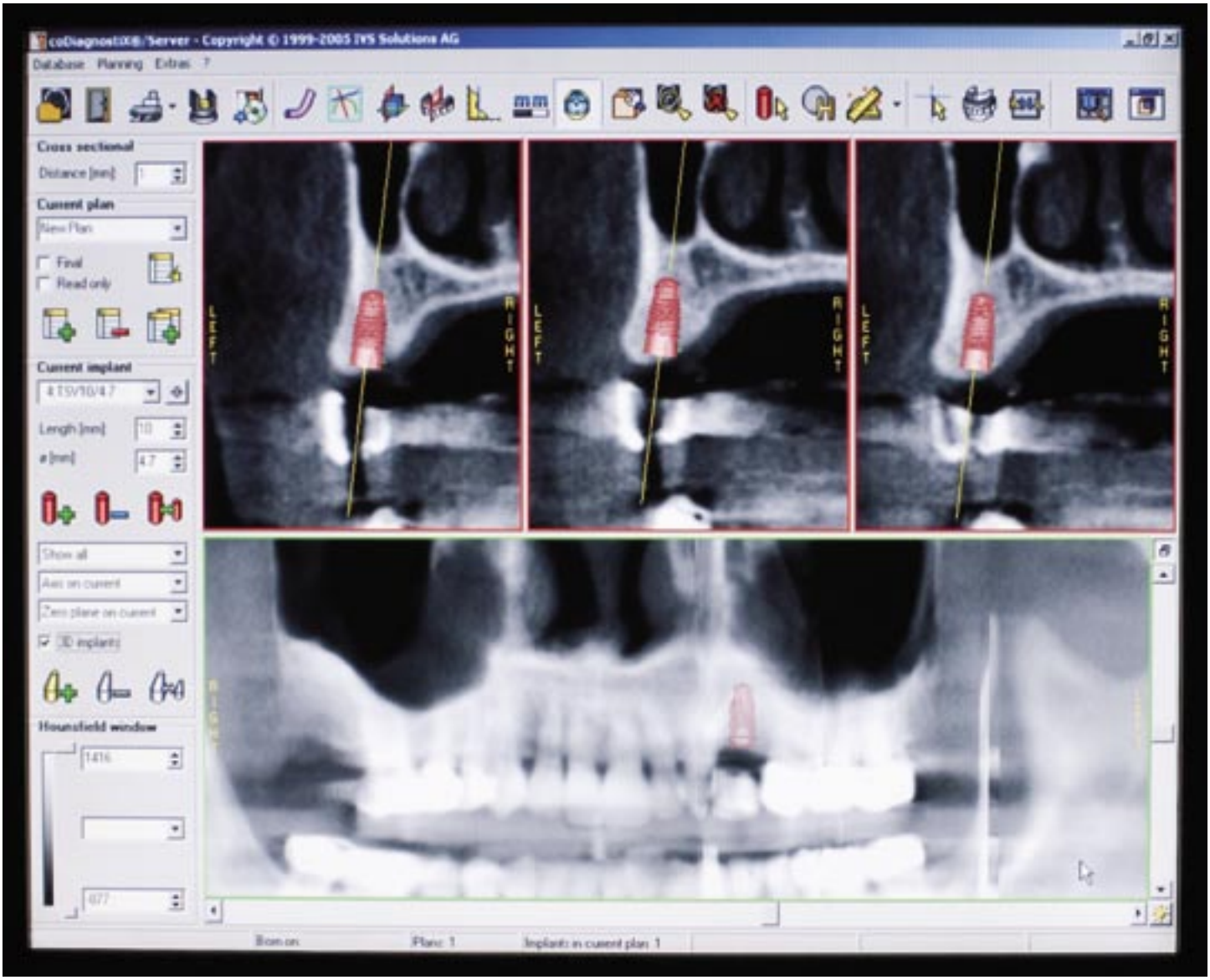

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The coDiagnostic software showing proposed implant position in three dimensions aligned precisely with the proposed barium sulfate final restoration position.

implants," Dr. Malin said.

Mike Strasser, MBA, CPA, works with Dr. Malin to reach dentists and help them use this technology to benefit patients and grow their practices. In making the technology "more easily available," Malin and Strasser literally bring the technology to individual dental practices to assist with the treatment planning and surgical preparation of the implant case as needed by the doctor. Two mobile CT units, the first CTs designed specifically for dental use, eliminate challenges frequently associated with securing CT technology.

The advantage of bringing the mobile CT unit to each dentist's office was appreciated by Todd Hehli, D.D.S., of Oak Park Dental in Eau Claire, WI. "It keeps patients with their treating dentists they have gotten comfortable with," explained Dr. Hehli.

Though many dentists see advantages to using CT technology for dental implants and viewing the temporomandibular joints, there are two big challenges that often prevent dentists from actually using the technology.

The first challenge is the expense of the technology. Owning your own CT unit can be quite expensive. It can cost up to $185,000 to install a CT unit in a dentist's office. "Profits from using this technology do not always compensate for the expenses of owning, installing and using this unit at lower volumes of activity," Strasser said.

"The second challenge we encountered was accessing hospital CT scans. These CTs are designed as medical CTs and are not specifically designed for dental use. In some cases, the patients have to be admitted and processed into the clinic or hospital in order to obtain these X-rays. Many hospitals charge $800 to $1,200 for CT scans," Dr. Malin said. "NIS only charges $250 per scan and takes the X-ray at the dental office." Another complication that deters patients from seeking hospital CT scans is the high doses of radiation exposure from non-cone beam units. "The normal exposure from the mobile cone beam CT of NIS, Inc. is 68 micro sieverts per full head scan. The hospital non-cone beam CTs are generally rated at between 1,200 and 3,300 micro sieverts, and they may also require multiple scans," stated Dr. Malin.

The actual CT scan taken in the mobile units is very similar to

a panoramic X-ray that most dental offices are familiar with. The patient sits up in a chair, a 20-second CT X-ray scan is taken, and the patient is finished. From that scan, the dentist can look at any part of the patient's head in a three-dimensional view by manipulating the image with computer software. The dentist may evaluate one or many proposed implant sites, the temporomandibular joints, the sinus areas, or anywhere else in the head that he or she has interest. There is a tremendous amount of information available from just one 20-second radiograph.

Dr. John Poage, D.D.S., of Dental Diagnostics and Implant Center in Minnetonka, MN, appreciates the cost efficiency of the services provided by NIS, Inc. "This truly makes CT technology easily available at reasonable prices," Dr. Poage said. "By using such wonderful diagnostic tools and CT technology, we'll certainly advance the accuracy and quality of implants with more than anything that's out there today."

The main benefit of CT technology to the field of implant dentistry is that it allows options on the fabrication of surgical stents guided by the CT image. The stents may vary from office-fabricated stents that can be created by the doctor and his assistants to computer-generated stents made by the lab from a study model along with a virtual treatment planning software called coDiagnostic. All of the different types of stents can be verified by CT scan. Having these various options allows the individual practitioner to make cost-effective decisions about the type of stent to be used and still guarantee an accurate surgical result.

Patient positioned for 20-second CT scan.

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"Many dentists do not provide implant dentistry because they feel they cannot completely control their cases, and they are still responsible for the implant results," Dr. Malin said. "CT technology allows for much greater control and communication between providers, which ultimately provides a much better result for our patients. The CT service increases proficiency because it takes away surgical and restorative unknowns and gives an accurate surgical result."

The "unknowns" are eliminated by the CT scan because it provides a view of the third (cross-sectional) dimension. "The third dimension is that dimension that is not discovered until the time of surgery without CT technology," Dr. Malin said. "The third dimension allows us to look at the underlying bone in all orientations, as well as the position of all vital structures."

This view of the third dimension also benefits any eventual surgery. "We can determine prior to surgery if the patient has adequate bone quantity and quality to support a dental implant in the appropriate orientation," Dr. Malin added. "In many cases, patient treatment plans are changed prior to surgery based upon that information."

Applying NIS technology to the overall implant process is seamless, and it is quite easy for dentists to achieve the goals of this process. Dr. Malin believes the position of the proposed restoration should dictate the placement and the angulations of the implant. Restoration to bone protocol and linear alignment of implant and abutment is easier when dental CT scans, adjustable guides and coDiagnostic software are applied. Dr. Malin views the implant process not as a series of complicated tasks, but as a set of choices

— choices with which dentists should be familiar.

Dentists know that the patient's candidacy for implants must first be evaluated. If the patient is a good candidate, the next decision is to decide on what type of surgical stent to make. The necessary processes to make surgical stents for full mouth rehabilitations, two or more adjacent implant sites, or individual implants are then implemented.

Dr. Malin uses basically three types of surgical stents for his implant patients. Two of the three have adjustable surgical guide tubes placed in the stents and the third one is a laboratory fabricated surgical stent directed by virtual treatment planning software called coDiagnostic; all stents directly utilize tomography or a CT scan.

The first type of surgical stent is usually made in the dental office. It is made by incorporating an adjustable surgical guide to a patient's maxillary or mandibular model and securing a drill guide to the study model by vacuum-formed acrylic material. This vacuum-formed material is very common in most dental offices. After the doctor places the proposed restoration locator on the study model, this form of surgical stent is then fabricated by dental office support staff. This type of stent is used for a single-tooth implant placement generally between existing adjacent teeth.

The second type of surgical stent also incorporates adjustable guides in the stent. This type of stent is made in the laboratory out of

Right: A stent with proposed restoration location.

Below: NIS parts used in stent preparation with surgical tray.

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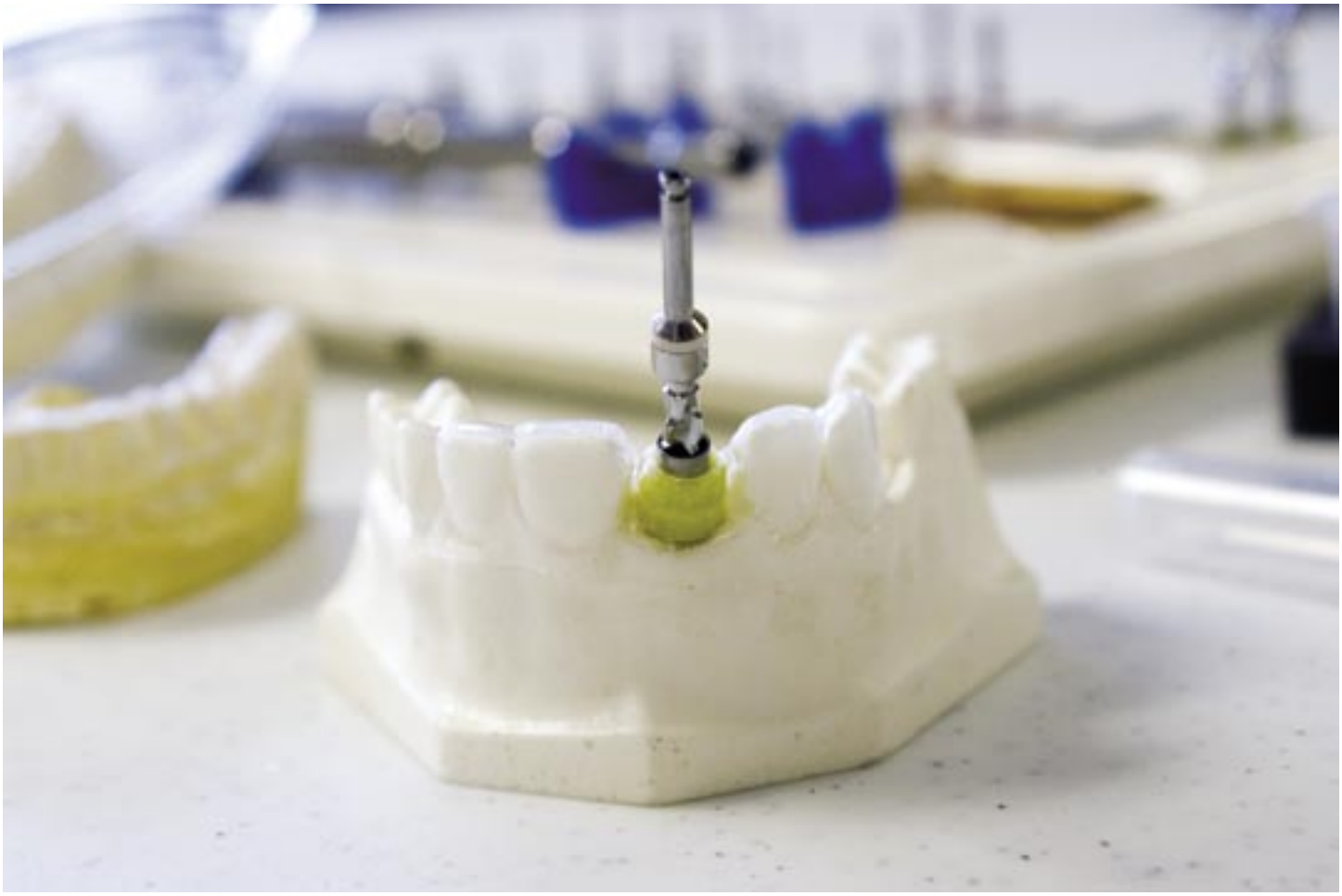

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Drilling through the adjustable drill guide.

hard acrylic material with adjustable guide tubes incorporated into the stent. This stent is used when the doctor has proposed multiple adjacent implant sites or the implants sites are in distal extension areas. The hard acrylic stents serve two purposes. In the distal extension areas, hard acrylic stents provide more stability at the time of surgery than the vacuum-formed material.

Secondly, in the multiple adjacent implant sites, hard acrylic stents are fabricated to show the positions of the final restorations. The adjustable guide tubes are inserted inside those acrylic tooth positions, which insure proper positioning of the implants to support the final crown. The hard acrylic stents are virtual wax ups of the final restorations with the guide tubes inserted in the center of those occlusal tables. This ensures proper orientation of the implant placement to the final restoration.

The third type of stent is also made out of hard acrylic in the laboratory. It does not require adjustable guide tubes. The surgical guide is made by incorporating the CT scan information into a virtual treatment planning software called coDiagnostic. The doctor and his or her laboratory technician use this information to construct a fixed guide tube surgical stent. No adjustment in the guide tubes are necessary because the tubes are fixed in the stent with the proper orientation incorporating information from the CT scan with the coDiagnostic software.

Depending on which type of stent is prepared for each patient, the process used when the mobile CT scan arrives will vary. For the stents with adjustable guide tubes, the stents are fabricated in the office or by the laboratory before the truck arrives to that office. The stents are then inserted into the patient's mouth, the patient is seated in the CT unit, and the X-rays taken. If the guide tubes are positioned appropriately, they are cemented in place and the patient is ready for surgery. If the guide tubes need adjustment after the first CT is taken, they are adjusted and a new scan is taken to verify that the angulation is correct. Once all the implant guide tubes are adjusted appropriately, they are cemented in place, and the patient is ready for surgery.

In the second scenario, where the doctor is using the coDiagnostic software to construct a surgical stent, the process is a little bit different. The first thing that has to be done is the doctor has to get an impression of the maxillary or mandibular arch of the patient and send that to the laboratory to construct a scanning appliance to be used for the CT scan. Once the scanning appliance is back from the laboratory, the patient and the truck are scheduled to come to the dental office. The scanning appliance is inserted in the patient's mouth and then a 20-second CT scan is taken, and the patient is finished. The CT information is now incorporated into the coDiagnostic software.

The software is used by the doctor and laboratory technician to construct a surgical stent that precisely places the implants where they have treatment planned. The surgical stent is fabricated using this information and is returned to the dental office and the patient

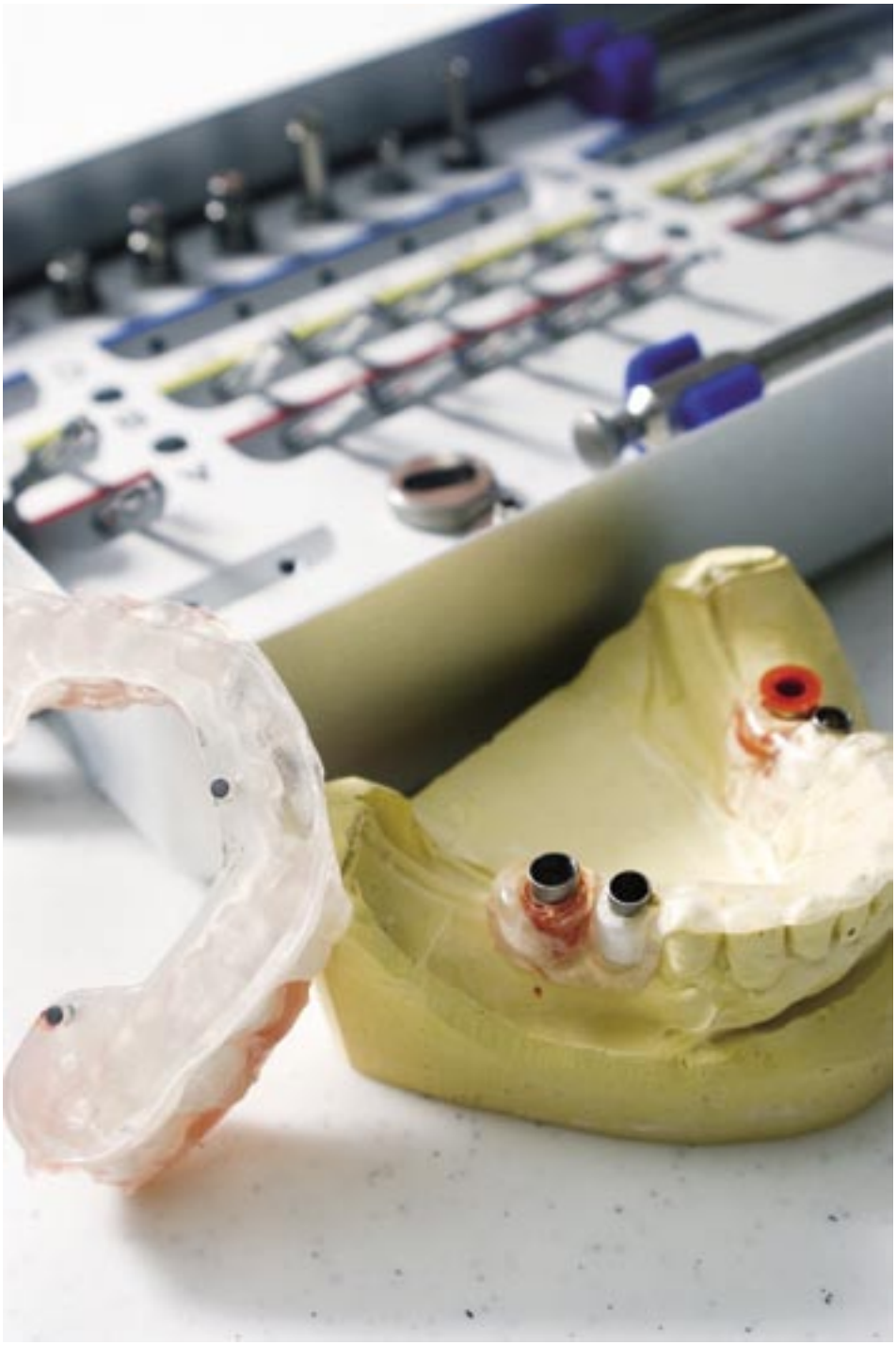
to be scheduled for surgery. In this scenario there is always only one CT X-ray taken and no adjustable guides are needed. "From one CT X-ray, the entire case is planned out regardless of the number of implants being placed. It is dramatically accurate and reduces or eliminates all surgical surprise," Dr. Malin said.

This process requires a highly trained dental laboratory. The only laboratory that uses the coDiagnostic software at this time in Wisconsin and Minnesota is Dental Crafters in Marshfield, WI. "I would recommend them to anyone," Dr. Malin said. Other labs nationwide are also acquiring the necessary coDiagnostic components.

Stepping away from the process for a moment, straight-line occlusal force is optimal both in individual implant cases and full mouth rehabilitation implant cases. While angled abutments are necessary in a few cases, they are usually a dentistry danger because the resulting lateral forces contribute to failure.

In any type of treatment, the CT-guided stent is valued for its accuracy and reduced invasiveness. "Most other surgical stents are designed using the patient's study model and making inferences about the underlying bone and soft tissue," Dr. Malin said. "It is a best guess type of scenario which many times does not actually correlate with what the surgeon finds at the time of surgery. This inaccuracy is what leads to surgical compromises and cosmetic disappointments. All of these disappointments can be avoided."

The stents also benefit the eventual surgery. "The stents make surgery less invasive because we don't have to reflect flaps to see what's underneath the tissue, as we've already determined what's there," Dr. Malin explained. Because the surgery is much less invasive, there is significantly less postoperative discomfort. There is no need for suture placement or suture removal. If bone grafting is necessary, it is discovered early in the treatment planning process and planned for. The width and length of the implant is determined, as well as the orientation of each implant, prior to surgery. The entire surgical procedure is planned and programmed into the surgical stent.



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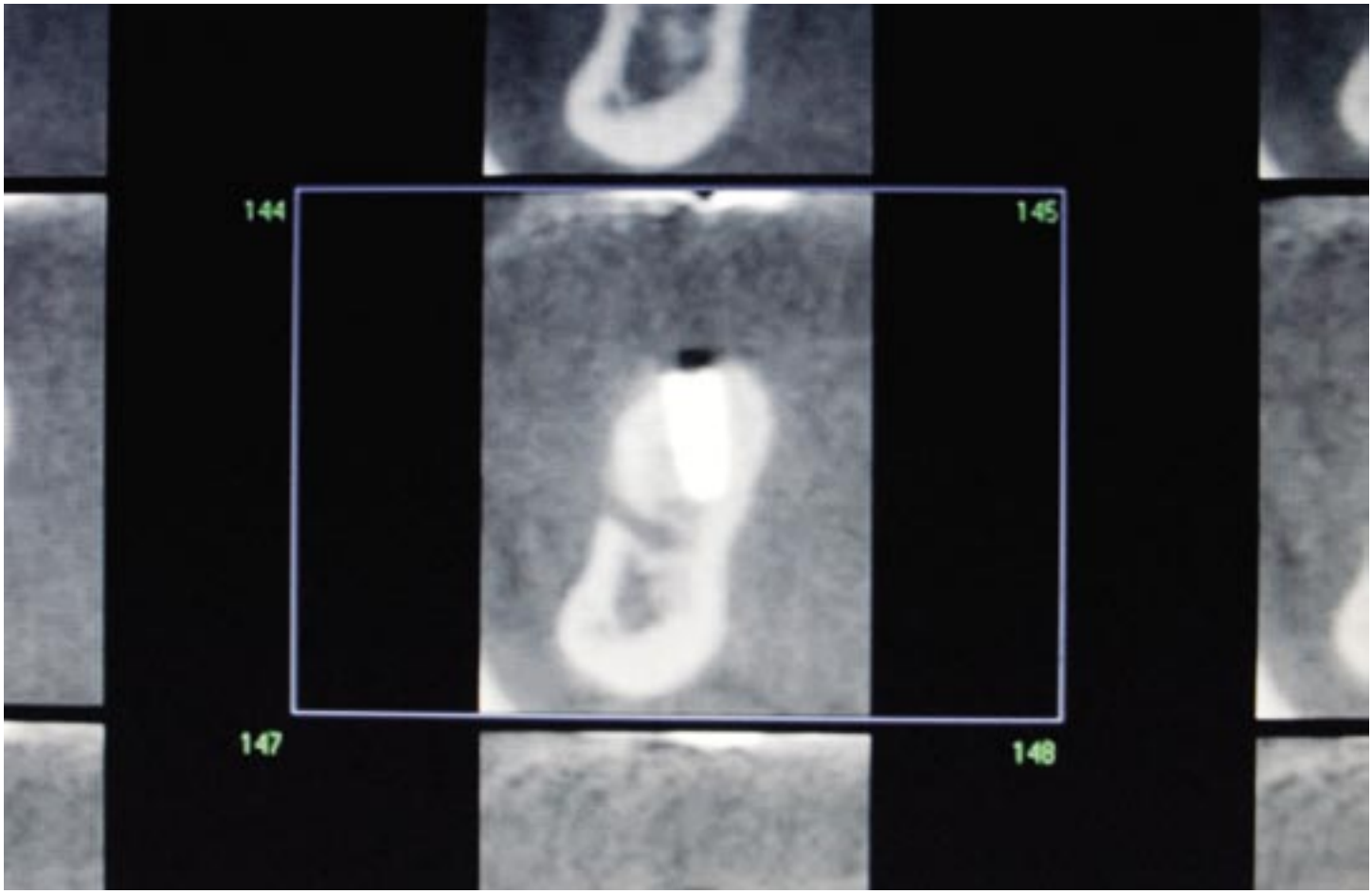
Virtual treatment planning scanning appliance with surgical stent and tray.

Dr. Poage values this service. "Leo modified it for us," Dr. Poage said. "They made this ingenious surgical stent. We had occlusion and everything ready to go. It helped us a great deal for orientation."

Precisely placed implants mean better functional and aesthetic results. The results are more functional because of the technology and proper planning. "If we do a better job as dental professionals when diagnosing the case, we will have fewer complications," Dr. Malin said. "The results are optimized."

Dr. Malin also credits planning for better aesthetic results. When everything is preplanned, problems can be avoided. "Particular challenges are avoided in many cases because one decides to do something in the preplanning process to avoid compromises," Dr. Malin explained. "Implant placement and position is critical for an acceptable cosmetic result. Poor placement position or orientation generally leads to an aesthetic compromise."

Preplanning also means less invasiveness — even in difficult cases.



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Cross-sectional view of a precisely placed implant in perfect linear alignment with the proposed final restoration.

One such case required 20 implants. "The implants were placed precisely where they were planned because of the CT technology and virtual treatment software," Dr. Malin said. "The surgery was much less invasive for the patient and completely controlled because of a proper surgical and restorative plan."

The technology and preplanning can make a dramatic difference for some patients, Dr. Hehli and Dr. Poage agreed. "We had a woman in her late 70s who was told that she was not going to be able to have implants without invasive surgery and a large amount of bone grafting," Dr. Hehli recalled. "After we did the CT scan, we were able to locate three areas that would allow a very minimal amount of grafting to successfully place the implants. She had very minimal discomfort because of the conservative approach."

Dr. Poage also had a patient for whom the process was particularly efficient. "We recently had a very healthy 54-year-old man with extremely advanced periodontal disease," Dr. Poage said. "He only had four remaining teeth in his mouth. We were able to put in 19 implants at once. We were able to precisely place each one."

When Dr. Hehli and Dr. Poage were first assisted with the technology, they attended classes that Dr. Malin directed. Dr. Malin has also taught classes to orient dentists with the technology/planning and even assist them when they begin to use it with their patients. Strasser also assists in the education process. "The feedback has been extremely positive," Strasser said. "We had a class just in October with dentists who were previously not doing implants. Eight of them have adopted the methodology since then."

Advantages include both services of mobile CT scanning and new CT-guided surgical stent preparation as well as another advantage: "Dr. Malin himself is a great resource," Dr. Hehli pointed out. "He's really trying to get these services out to patients and provide more of us with these services."

"The future is now, and more and more dentists are realizing that this technology can benefit their patients and their practices," Dr. Malin said. "Challenges associated with implant dentistry are not overwhelming and can be controlled. As more dentists learn about the technology and as accessibility to it continues to improve, the obligations of dentists to use implants will intensify."

Using this technology will ensure control of the implant case and provide a much more positive result for the patient and their dental provider. Patients will get the cosmetic and functional results they desire and the doctors and their surgeons will have complete control over their implant cases. "Everybody wins," Dr. Malin concluded.

Dr. Malin is the Implant Director at the Las Vegas Institute for Advanced Dental Studies (LVI). He instructs several courses annually at LVI on implant surgical and restorative procedures. The courses provide details of all of the protocols mentioned in this article along with live surgical courses. To receive more information about these courses, contact LVI at (702) 341-7978.

For more information, contact NIS, Inc. at (608) 386-3335 or Dr. Malin at (608) 269-5282. Visit their website at www.NIS-INC.us. ■