

ORAL LANDSCAPING

Because implant placement involves drilling into bone, clinicians rely on highly specialized instruments. *Mentor* offers sales reps an in-depth view of the kinds of tools that are critical to implant surgery

By Rebecca Stone

Dental implants were introduced in the United States in the early 1980s, and since then their popularity has continued to grow. Made of biocompatible materials, they are surgically placed in the jaw, forming a scaffold for the attachment of abutments that accommodate crowns or other prosthetics. Used to replace a single tooth or to populate an entire edentulous ridge, implant therapy calls for highly specialized tools to help ensure success.

After extracting the tooth in question, the clinician may employ a number of instruments. But in the view of many operators, including Michael Tischler, DDS, who has a general, implant and cosmetic practice in Woodstock, New York, perhaps the most crucial tool for case planning is cone beam computed tomography (CBCT). These units produce a highly detailed, three-dimensional X-ray view. In Tischler's estimation, "lacking a 3D CBCT view, a case cannot be properly planned for implant position, length and width."

Michael Sonick, DDS, whose implant and periodontal practice is based in Fairfield, Connecticut, agrees on the value of CBCT for implant placement. "It's pretty much the most critical instrument," he says, noting that it takes the guesswork out of implant procedures. "There's really no need anymore to say 'we don't know what we're going to find until we go in there.'"

Sonick adds that CBCT, which emits about 1/70th of the radiation of a conventional medical computerized axial tomography (CAT) scan, is useful for diagnosis, as well as examinations, patient education, treatment planning and fabricating surgical guides. "It allows us to visualize the

anatomy in three dimensions, so we know how much bone there is. We also know how far we are from vital structures such as the mandibular nerve, maxillary sinus or adjacent teeth. It lets us evaluate not only the quantity of bone before we do implant surgery, but also bone quality and whether any pathology is present."

This makes a lot of sense when you consider that one of the most common reasons for dentists to be hesitant about adding implants to their list of services is fear of nicking a nerve or damaging adjacent structures. With 3D radiography and the ability to virtually plan implant surgery before the blade touches the gingival crest, such fears are becoming increasingly unfounded. And when a clinician can charge more than \$3000 for a basic implant procedure, that's a fear worth conquering.

STREAMLINED TREATMENT PLANNING

Sonick also notes the added value of the available software that, in conjunction with 3D radiography, streamlines treatment planning. "It allows clinicians to take all their radiological data from the CBCT scan and put it into their treatment-planning software — and they can actually place virtual implants in the software," he explains. "It also makes for a very dynamic educational treatment-planning presentation. What I like to say is that we can treat the patient digitally before we actually perform the surgery."

Tarun Agarwal, DDS, whose cosmetic, implant and general practice is located in Raleigh, North Carolina, emphasizes that planning and



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DENTAL IMPLANT TECHNOLOGIES

- Cone beam computed tomography (CBCT), also known as three-dimensional radiography, allows clinicians to know beforehand what type of an armamentarium they will need, which is a timesaver.
- The use of CBCT imaging and accompanying software allow virtual surgery prior to the actual procedure, which takes the guesswork out of surgery.
- Drill guides can be helpful in the precise placement of implants — though not all clinicians think they're necessary.
- Sinus lifts allow bone graft insertion under the sinus floor to aid implant placement and stability.

execution are critical to successful outcomes. "If you have a great plan — which is much easier today thanks to 3D imaging," he says, "and a way to precisely execute, which is much easier thanks to guided surgery from 3D virtual planning, 90% of the work is done for you."

But CBCT can't do everything. Other instruments that come in handy when virtual surgery becomes reality include scalpels, elevators and osteotomes. Sonick, who says he uses a "basic surgical setup," thinks it's important to have a good set of surgical instruments, including a rotary bone-spreading instrument (or osteotome).

"A rotary osteotome is a slow-speed bur," he explains. "But it doesn't drill, it just expands the bone, increasing the density through compression. So if clinicians encounter poor-quality or softer bone, it allows them to prepare a site without taking away bone. This is beneficial in that harder bone is needed so the implant will engage and remain stable. It's also useful in elevating the sinus."

X MARKS THE SPOT

Another spin-off benefit of CBCT and its software is the creation of surgical guides. Also known as drill guides, these are like jigs that help ensure proper placement of implants. "Placing implants is a surgical procedure that's prosthetically guided," says Sonick. "It's no longer enough just to have implants integrate [into the bone]. They must be placed in adequate bone in the ideal prosthetic position. With the right software, clinicians can develop a guide that will help them achieve ideal placement."

Edward Feinberg, DMD, who operates a restorative practice in Scarsdale, New York, says he does not place implants himself, but teams with an oral surgeon, who follows the drill guides — also known as stents — that Feinberg provides. "For most of my cases, I make the stents myself in my laboratory from clear acrylic, and I hand-carve the teeth on the stent exactly the way I want them. This lets the surgeon know where the implants should be placed."

In Feinberg's opinion, implant placement cannot be done by eye — even by the best surgeon. He says that he has worked with a surgeon who uses

THE DRILL ON BURS

Implant burs are available in kits from various implant manufacturers and offer clinicians a succession of the types of burs needed to complete an implant procedure. According to Tarun Agarwal, DDS, who operates a cosmetic, implant and general practice in Raleigh, North Carolina, "Third-party burs are available, but, generally speaking, the dentist uses burs engineered and shaped to match the particular implant. These burs are different from traditional operative burs as they are designed to run at much slower speeds for bone cutting."

Initially the implant site must be prepared by drilling into the alveolar crest with a twisted, narrow-gauge bur designed to create an access cavity. From there, successively larger burs are used, drilling to the length of the intended implant. Depth of the perforation, or osteotomy, can be checked with a depth gauge that may be furnished with the kit. Pins can be used to check the angle of the osteotomy, and a ratchet may be used to complete implant seating before applying the cover screw.

For dense bone, a countersink or tap may be indicated, and these are often offered as options. "Implants are screws," says Agarwal. "Think of it like putting a screw into oak versus a soft wood. Sometimes you have to drill a bigger hole in hard wood to get the screw to go all the way in. The tap puts the screw lines in so the screw will go in easier. The countersink is mainly used with implants that have head designs that flare, so dentists can make just the top portion of the osteotomy wider and larger to accommodate the implant."



CBCT to make the surgical guide from a model that includes a wax-up simulation of the finished restoration. "Based on the model and CBCT analysis, an acrylic stent is created with metal tubes for the implant drill. It includes instructions on which drill to use and how deep to go," Feinberg explains.

He recalls a case in which the surgeon was able to use the CBCT-created stent to place the implants without even laying a flap. "The implants were placed perfectly and they were as long as possible," Feinberg reports. "I watched the entire procedure, and it was amazing — CBCT is very cool technology, but it may not be ideal for every surgical situation."

It's important for sales professionals to know that not all clinicians believe drill guides are necessary. Tischler, who considers CBCT essential, says that experienced clinicians don't need guides. "According to

the literature, drill guides that are soft-tissue based are inaccurate. And guides in general are also cumbersome. In my opinion," he says, "an experienced clinician can use CBCT technology to guide proper implant placement without a guide.

"The second most important instrument is the implant drill. The keys are to make sure the bone is prepared properly without heating it too much, and making sure the osteotomy site is correctly prepared."

WORDS TO KNOW

Edentulous: Toothless

Osteotome: A chisel-like bone-cutting surgical instrument

Osteotomy: The surgical cutting or removal of bone

Osseointegration: Integration with bone tissue

CULTIVATING BONE

Sometimes, for any number of reasons, there may not be enough bone structure to support an implant. In such cases, clinicians may look toward guided bone regeneration to solve the problem. Thanks to this now-common procedure, implants can be successfully placed in a broader range of patients — who otherwise would likely be consigned to denture wear.

Such cases often involve what's known as a sinus lift, indicated when there is not enough bone for implant placement in the maxillary arch. "When there is less than 9 mm of bone in the sinus area," explains Tischler, "the sinus membrane can be bumped up with osteotomes or grafted laterally."

"For a sinus lift in the posterior part of the upper jaw," adds Sonick, "we will add bone to the interior border of the sinus via the osteotomy site through what we call a 'lateral window.' We make a small window on the lateral border of the sinus and add bone to that."

In essence, the bone grafts will increase bone density to support the implant by lifting (or thickening) the floor of the sinus. According to Sonick, three things are needed for bone regeneration: the vital bone or soft tissue cells; a scaffold in which these cells grow (usually the bone graft); and growth factors that stimulate the bone cells in the patient's body to grow through the graft. "When you're talking about platelet-rich plasma preparations," he says, "you're talking about growth factors."

Sonick notes that platelet-rich plasma is composed of growth factors, or signaling molecules, that signal other cells to grow into a particular

area. These growth factors can be obtained by drawing blood from a patient. But these days there are less invasive alternatives in the form of synthetic growth factors, which is typically what Sonick now uses.

He also emphasizes the importance of placing a barrier membrane between the graft material and soft tissue. "You create a compartment between the membrane and bone where you place the graft and growth factor," he explains. "The compartment is isolated so the soft tissue can't grow into the graft. The bone can grow there unmolested and you can generate more bone."

TRENDING NOW

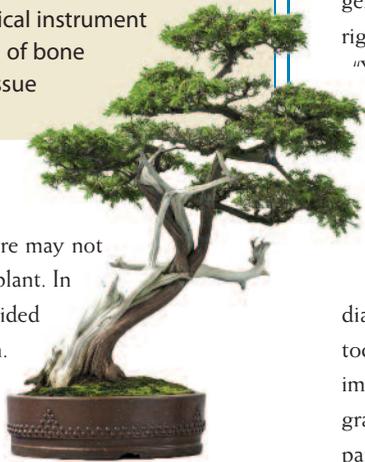
For the most part, the key opinion leaders with whom we spoke agree that the need for speed looms large in procedures such as implant surgery. But they're not all convinced this is a good thing. "What is very hot right now is immediate implant placement and restoration," says Sonick. "You place implants into extraction sites the day you take the teeth out, and oftentimes you can immediately load the implant. You need to have a very talented surgeon and restorative dentist present at the same time to get an ideal result. If the case is amenable to that, it's a great service for the patient. You also get a better cosmetic and functional result much sooner."

But Feinberg thinks the jury is still out on same-day service. "Immediate loading is experimental in my opinion," he tells *Mentor*. "The protocol with the best track record is for the oral surgeon to place the implant and wait three to four months while the implant osseointegrates. Then it is uncovered and a healing cap is placed, and the patient comes to me with the healing cap(s) in place. My first procedure will be to make a temporary that simulates the finished crown or bridgework and trains the gingiva to the desired shape and form. Once I've made the temporary to ideal proportions, I know how to make the finished restoration. I think if something is going to be inserted into the bone, it is wise to follow the protocol that will provide the best chances for success."

"Here's the reality," says Sonick. "Human beings haven't changed much in the past 20,000 years. We're still biological entities and we still take time to heal. But we live in an impatient society. Patients want things immediately and dentists want to provide what patients want — but that's not always possible. Personally, I like taking a more conservative course to get a more predictable long-term result. I'm concerned about technology pushing us to go too fast."

There is no doubt that implants have taken root in not only dental practices but in the imaginations of patients. For this reason, it makes sense for account professionals to bone up on these procedures and the products, instruments and technology that support them. "Implant placement is one of the fastest-growing sections of dentistry," observes Agarwal. "Sales reps should be able to suggest, encourage, and offer continuing education events to their dental customers."

These techniques and related products are, indeed, changing the landscape of restorative dentistry. And there is no doubt they will also alter the geography of dental supply sales. 



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BONUS WEB INFORMATION

IMPLANT CHALLENGES

We asked our key opinion leaders what they considered to be the greatest challenges in implant surgery and placement. For Michael Sonick, DDS, whose implant and periodontal practice is based in Fairfield, Connecticut, the main challenge in this type of procedure is the patient who has an inadequate amount of bone that must be regenerated before implant surgery. “Bone grafting,” he says, “can be done at three different periods: time of extraction; post extraction; and at the time of surgery. But it should be done as early as possible — at the time of extraction — in order to realize the greatest potential for long-term success.”

But Michael Tischler, DDS, who operates a general, implant and cosmetic practice in Woodstock, New York, casts a wider net when it comes to procedural challenges. “Creating an overall plan that is based on the prosthetic end result is a key challenge,” he says. “A clear end point must be identified before a case is started, and this must be conveyed to the patient.”

Tarun Agarwal, DDS, whose cosmetic, implant and general practice is located in Raleigh, North Carolina, believes that the most important considerations in implant placement are the operator’s skill set, education and confidence.

Among the top concerns for Edward Feinberg, DMD, who operates a restorative dental practice in Scarsdale, New York, is to ensure there is adequate screw access. “Implants don’t necessarily last a lifetime,” he says, “and I like to have control if something goes wrong. I have seen implants fail after 20 years, and no one can predict with certainty what is going to happen. The other major consideration for implants is that they are feats of engineering and will fail if they are overloaded with forces. It is important to realize that implants must be placed in the bone at adequate lengths to support the restoration, and they must not be subjected to destructive lateral forces.”