

Advancing the Standard of Care in Implantology

Q&A with Barry Levin, DMD

Inside Dentistry interviews Barry Levin, DMD, a clinical associate professor of periodontics at the University of Pennsylvania School of Dental Medicine and a private practitioner in Jenkintown, Pennsylvania

INSIDE DENTISTRY (ID): Zirconia implants are currently in vogue. Is this a passing phase, or are the advantages attributed to them (eg, biocompatibility, noninflammatory characteristics, longevity, esthetics, etc) scientifically supported and signals of where implant technology is heading?

BARRY P. LEVIN, DMD (BL): Zirconia implants are significantly behind titanium in terms of scientific support. They have not been proven to have a complication rate as low as titanium implants over a long period of time. The body of evidence is not even close. A zirconia implant is white, so from an esthetic standpoint, if the tissues are very thin or the patient has a thin biotype, the lack of a darkening effect in the soft tissue can provide an advantage. The literature includes a small amount of case reports documenting patients with titanium allergies, but the possibility exists that we will eventually see zirconia allergies as well. That is an unknown at this point. One reason to be very cautious is the fact that many ceramic implants are one piece, so a fracture becomes a catastrophic failure. Removing a ceramic implant is more invasive and associated with greater morbidity than removing a titanium implant. In many cases, when we remove a titanium implant, we start with reverse torque, but you cannot torque out a fractured piece

of zirconia that is integrated into the bone. If you base your practice on proven science that is documented in the literature, you would be hard-pressed to find research that is not funded by zirconia implant manufacturers. I am not aware of any independent, university-based studies that show a zirconia implant providing a statistically significant advantage over a titanium implant.

ID: What about the introduction of growth factor enhancements for bone regeneration matrices? Do these materials provide a significant advantage over unenhanced regenerative materials?

BL: Yes, but we must always walk the line of justifying the cost of a material with its benefits. Growth factor enhancements are very expensive. If the patient is healthy and normal wound healing is anticipated, growth factor is probably not necessary for guided bone regeneration unless the amount of regeneration required is unusually ambitious. For periodontal surgery, I do utilize growth factors—primarily platelet-derived—to enhance the regenerative potential of the procedure. For patients whose medications may delay normal wound healing, the use of these growth factors is a tremendous advantage in terms of both avoiding complications and achieving the desired result. There are no disadvantages to using growth factors for regenerative surgery other than the possible occurrence of short-term postoperative swelling because of the angiogenic effect.

ID: Zygomatic implants are another advancement that we are reading a lot about. Is the surgery as radical as it seems, and how have

these implants impacted a surgeon's ability to treatment plan and deliver maxillary cases?

BL: The surgeries are still rather invasive. With guided surgery, it is a much safer procedure today than it was at its inception. However, it still has risks associated with it. Zygomatic implants offer a real advantage for a patient who is aware of the risks and has such a severely atrophic maxilla that this may be their best chance to achieve a functional restoration. Personally, I do not place zygomatic implants because I am not necessarily the most qualified clinician to manage an infection or complication associated with an implant in such close proximity to the orbit.

ID: Are you a proponent of autografts or allografts, or does your choice depend on the clinical scenario?

BL: I primarily utilize allografts in almost every grafting procedure I perform. At one time, we were going to the mandible and harvesting autogenous bone, but I stopped doing that because significantly more morbidity is associated with it, and there are so many alternatives for scaffolds, such as resorbable meshes, tenting screws, and membranes. The literature shows that when you are taking a block graft, there is significant resorption unless you add a xenograft, membrane, etc. For the past dozen years or so, I have achieved my desired results using allograft material and sometimes growth factor. In addition, for every implant procedure, I use a dappen dish with sterile saline to save all of the autogenous bone shavings from the implant drills and incorporate that material into my allograft.



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ID: Of course, we need to talk about cone-beam computed tomography (CBCT) and guided surgical planning. Are we at the point where these are the standard of care in implant surgeries?

BL: The use of both modalities is absolutely not the standard of care. Using a CBCT scan is the standard of care but performing guided surgery is not. There are disadvantages to guided surgeries; they are not 100% accurate. In situations where the guide is not accurate, if you are not prepared to adapt midprocedure, you should not be performing guided surgery. There is also a lack of tactile perception. It can be difficult to appreciate the density of the bone adequately with guided surgery. Of course, guided surgery is useful in many cases. I also use computer navigation, which offers a lot of advantages because you do not need a physical guide, and computer-navigated surgery has been shown to be as accurate as guided surgery. With navigation, the camera follows fiducial markers on the drill in real time as it goes into the osteotomy, allowing you to see if you are within the site that you planned to be in or if you need to adjust. It is more affordable for the patient than having a surgical guide fabricated; however, it is not ideal or necessary in every case, and there is a learning curve. That being said, none of these techniques are the standard of care at this point. It would be very difficult to justify adding an additional \$300 to \$1,000 to every case to make a surgical guide when 50% of the implants that I place are immediate placements for which I can better visualize and get a feeling for the bone quality without a surgical guide. However, if the dentist placing the implant is aware of the presence of local anatomy that could potentially increase the risk of a particular case, the option of guided surgery is helpful or even advisable.

ID: What other trends or developments have you observed in implantology?

BL: Perhaps the most encouraging one is the shift back to screw-retained restorations. Most implant manufacturers now offer angle-correcting options among their abutments. I work with one company that even offers angle correction from 12° to 30° that is built into the implant itself. Previously, it was assumed that an implant in the maxillary anterior would require a cemented restoration, but complications were often caused by the cement or by porcelain fracturing and damaging the abutment. Having the option to place screw-retained restorations in more situations is probably the biggest advancement during the last few years in implant dentistry.

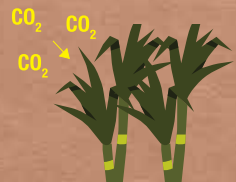
ID: Looking forward, are robotic surgery assistants the future of implantology?

BL: I do not know. Cost will be a significant factor. The use of robotic surgery in medicine for tumor removals, prostate treatment, and other procedures can be beneficial because of its minimally invasive nature. For dental implant surgery, the use of robots is likely so far in the future that the idea is more of a novelty at this point. However, 10 years from now, robots may be marketed like scanners and mills are today. There was a time when the use of those technologies seemed remote, and now they are widely used. But at this time, robotic surgery does not appear to be even close to ready for use in implantology. The most important thing with this and any technology is to ensure that the science behind it is validated before it becomes considered the standard of care or even highly recommended.

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