

Evolution of Implant Design: Two-Piece Zirconia Implant Combines Strength, Esthetics, and Disease Resistance

Dallas, Texas, clinician Ted Fields, DDS, PhD, has had a longstanding interest in implantology. In fact, he relocated to the Dallas area specifically to train with one of four surgeons handpicked by Swedish implant inventor Per-Ingvar Brånemark to introduce the then-new technology to the United States in 1981.

Fields is among those with the widely held belief that implants are nearly always the option of choice for tooth replacement. “It’s pretty much a settled issue that implants are the longest-lasting, tissue- and hygiene-friendly approach to replacing missing teeth unless there’s a good reason—such as medical or patient preference—to do something different.”

Fields regards the use of zirconia, such as that used by Z-Systems in its two-piece implant, to be a welcome continuation of the trend away from metal to high-strength

ceramics. “Only 10 years ago, 85% of crowns contained metal, and now at least 90% of the crowns made in the United States are completely metal-free.”

This, he says, is a good thing and was made possible due to improvements in ceramics. “Earlier ceramics had nice esthetic properties but weren’t strong enough to be used alone in posterior teeth; they had a high fracture rate.”

All that changed, Fields notes, with the development of two specific types of ceramics that have high enough flexural strength to withstand chewing forces, even abnormal ones such as grinding and clenching. “Thanks to the introduction of lithium disilicate and zirconia—ie, zirconium dioxide—we now have ceramic restorations that actually outperform the restorations used 10 years ago that contained metal.”

Fields began placing all-zirconia dental implants cautiously in 2008. One difference

in particular was immediately apparent, he says. Unlike titanium, which can oxidize and “tattoo” or show through thin gingival tissue, this white ceramic is visually imperceptible, even beneath the thinnest anterior gingiva.

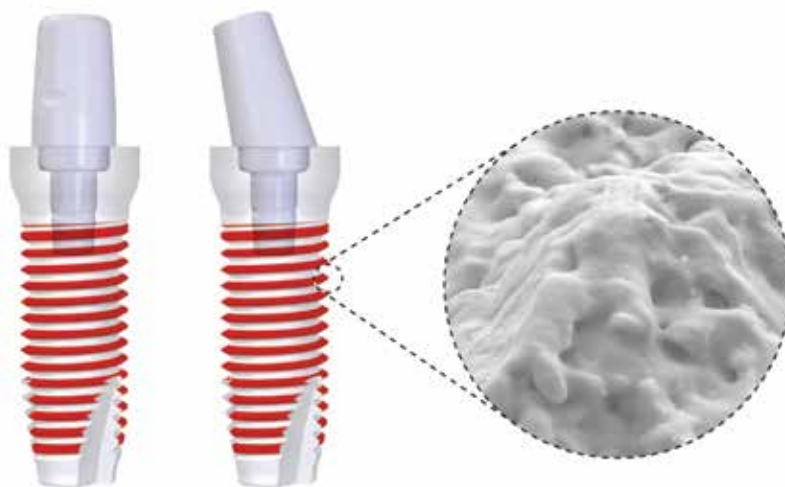
For many of the same reasons for the zirconia rush in crowns, the material offers significant advantages over metal—ie, titanium—for implants as well, Fields suggests. These include improved esthetics and better tissue health. Moreover, significantly less plaque forms on zirconium oxide ceramics, which reduces the risk of peri-implantitis and cardiovascular disease.

However, he cautions, not all zirconia products are created equal. He says that Z-Systems’ innovative polycrystal “HIP zirconia” uses a strong material and makes it even stronger. These material modifications, he adds, also prevent water absorption, which prevents aging of the material and, together, these features make breakage a thing of the past. Furthermore, he says, the material supports oral health because plaque and bacteria attach less to zirconia than any other surface in the mouth, thus lessening the chance of dental disease-related implant failure and problems with the adjacent teeth.

“When I was giving talks in 2010, only 7% of implants I was placing then were zirconia, because there was only a 2-year track record,” Fields explains. However, after 7 years, they now account for about half of the implants he places, largely due to their success and patient satisfaction, he notes. “They provide a very clean surface. They look better, and the tissue looks much better. This enables us to provide improved long-term results for patients.”

Fields believes that their many advantages make Z-Systems implants much more than a niche product. “Rather, they represent an evolution of implant design,” he comments, and notes that sales really took off due to what he calls the greatest innovation—its two-piece preppable design with separate abutment and implant.

Looking to the future, Fields anticipates the next great step in implant dentistry to be developing a way to immediately restore dental implants with full functional loading, which he calls “the holy grail of implant dentistry.”



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