Editorial Article

Biological Dentistry and Dental Implants

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Nowadays the holistic "metal-free" trend is extending from crowns and bridge prosthesis to implantology and that is what we call" biological dentistry" Titanium has been the metal of choice for dental implants for the last few decades. However, the subject of metal allergy has gained much attention in recent years, it was strongly asserted that titanium was very biocompatible, with no incidence of an allergic reaction. However, these claims have proved to be inaccurate.

Ceramic, zirconia-based implants have emerged as a metal-free biocompatible, bio-inert aesthetic, non-toxic alternative with a lower plaque affinity as compared to titanium implants, zirconia won't decay, which means it will never trigger chemical reactions, migrate to other sites in the body or interfere with the overall health.

Titanium and zirconium are the only two elements that do not block implants from integrating into the bone. In regards to integration with the bone, zirconium implants appear to offer the same success rates as titanium implants. Some dental professionals may view them as less stable and liable to fracture than the standard titanium implant.

In the early 2000s, there were only two FDA-approved and commercially available ceramic implant systems in the United States. As of today, the two top implant manufacturers in the world have ceramic implants and there are seven FDA-approved and commercially available ceramic implant systems in the USA.

Composition of titanium and ceramic implants

Titanium alloy implants are made of metal alloys with manufacturer-specific proportions of titanium, aluminum, and vanadium. On the other hand, zirconia implants are made of ceramic composites and

the components consist of zirconia, yttrium, and alumina, which explains the metal-free zirconium composition and being thermally nonconductive material.

Biological effect of titanium implants versus ceramic implants

Titanium implants have been found to corrode and release metal ions in peri-implant tissues leading to problems ranging from tissue discoloration, metal sensitivity to peri-implant osteolysis that lead in many cases to aseptic implant failures, Ceramic implants given their molecular structure are not susceptible to corrosion, Also having less plaque and tartar affinity than titanium.

Reaction to Electromagnetic Fields

Being a metal, Titanium reacts to electromagnetic fields, especially when combined with other metallic fillings or other metallic implants.

Dr. Lina Garcia, from The International Academy of Biological Dentistry & Medicine, has witnessed many of these health hazards. She elaborates Titanium implants, particularly when combined with other ˜toxic teeth causes sleep disturbances, anxiety and other neurological problems, thyroid dysfunction, digestive problems, heart problems, and other chronic symptoms.

Since ceramic implants are metal-free and react in no way to electromagnetic fields, this health implication is taken off the table.

Surgical protocol of titanium implants versus ceramic implants

Surgical protocol and a healing time for both implant types remain the same and according to the case. At first Ceramic implants were only found as one piece which had some limitations in the clinical application Such as Full mouth treatments that cannot be completed having one-piece zirconia abutments but need screw-retained restorations and custom abutments.

However, nowadays it is available as a two-piece implant, which allowed a wider range of applications as predictable as titanium implants.

Cost of titanium implants versus ceramic implants

There is a difference in cost between the two types of implants, zirconium implants cost more than titanium dental implants partly because of what's involved in the manufacture and because the

placement procedure can be more complicated and time-consuming

Metal allergy

Very rare, but some people get an allergy to titanium, a low incidence rate of 6%of patients. Because of poor sensitivity, patch tests have restricted use and the test does not detect sensitization in the MELISA test. The test is known to yield a false positive.

Clifford material reactivity testing is a blood test that decides the reaction to well-known dental materials giving valuable information regarding current allergies, however, outcomes cannot be complete when it is about testing for materials to which the patient is not been exposed yet.

Conclusion

Ceramic implants are not a replacement for titanium implants, but an excellent alternative in a range of cases. Uniquely, they can meet the needs of a patient preference for 100% metal-free materials, with the esthetic reassurance of white color.

It is worth remembering that zirconia dental implants are still relatively new and have not had the clinical testing and research behind them that titanium implants have.

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