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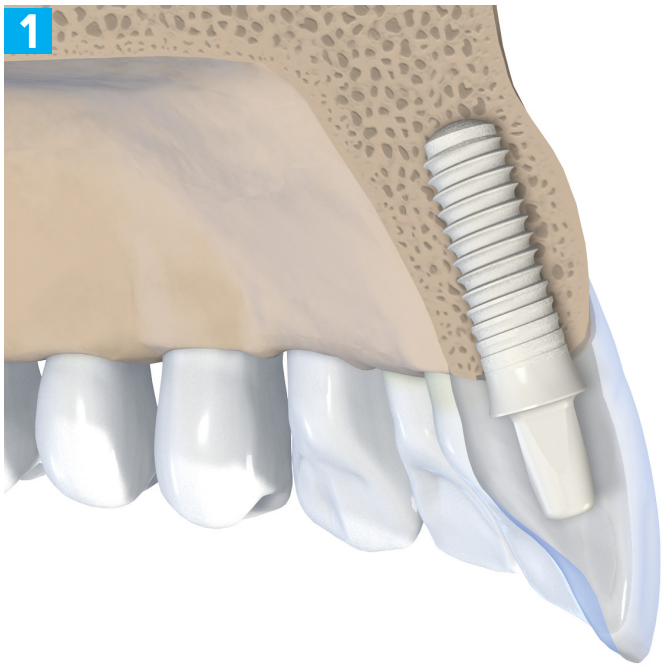
WHAT ABOUT CERAMIC IMPLANTS?

Maintenance and Home-Care

Implants are a proven, successful tooth and root replacement with titanium as the go-to material for implants due to biocompatibility and proven mechanical properties. Ceramic, zirconia-based implants have emerged as a metal-free, aesthetic, non-toxic alternative with a lower plaque affinity as compared to titanium implants. [1,2]



Zirconia ceramic (ZrO2) is now being used as a restorative biomaterial, for implants and implant abutments. This is primarily due to its tooth-like color and light transmission making it a preferred choice to the gray color of titanium especially in the esthetic zone.

There is still some confusion on how ceramic, zirconia-based implants, are considered metal-free with zirconium in the composition. Zirconium is by definition the metallic form of the element Zr, a grayish-white transition metal. Zirconium dioxide (ZrO2) by contrast is a white crystalline oxide of zirconium also called zirconoxide and is 100% ceramic material. Metals are highly reactive and atoms of metal elements such as zirconium collide with atoms of non-metallic element like oxygen forming an ionic compound ZrO2. This allows for properties changes such as the white color, minimal electrical conductivity, and barely reactive for an ideal implantology application.

The question then becomes what instruments are safe to debride ceramic implants and are the home-care recommendations different? Biofilm as a major risk factor for peri-implant disease, making removal of plaque, biofilm at time of in-office maintenance visit and home-care recommendations to prevent biofilm formation the cornerstone of implant maintenance.

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Biofilm formation for zirconia-based implants have been compared with titanium and found to be similar in vitro and in vivo.[3] Other studies show no significant differences in initial adhesion, biofilm thickness, or periodontal pathogens in culture between titanium and ceramic implants.[3,4]

Professional implant maintenance protocol for ceramic and titanium should include; removal of biofilm with powder streaming device using erythritol or glycine powder (14 and 25 microns particle size). Followed by assessment and debridement if calculus or residue is present. The use of titanium implant scalers or titanium ultrasonic tips have been shown in scanning electron microscope (SEM) studies to effectively remove the calculus or residue and not leave residue behind on both ceramic and titanium implants.

For optimal implant maintenance, complete the maintenance protocol with the use of an antimicrobial varnish, Cervitec Plus by Ivoclar Vivadent, which can prevent biofilm formation for up to three months.[5] Schedule in-office maintenance recare at least every six months based on medical systemic risk factors, pervious periodontal disease, general overall health and home-care.[6]

Home-care recommendations are vital with placement of any implants with a focus on biofilm elimination and ceramic implants have been shown to accumulate less plaque for resulting improved soft tissue management.

American College of Prosthodontists Clinical Practice Guidelines state patients with implant-borne restorations use these oral hygiene aids; dental floss, water flosser, air flossers, interdental cleaners, and electric toothbrushes to disrupt biofilm daily.[6] For healthy implants, a protocol of brushing, floss or use water flosser, rubber tip stimulator for keratinized tissue and rinse with non-alcohol antimicrobial mouth rinse twice daily is recommended.[7]

Ceramic, zirconia-based implants, offer another alternative to titanium implants with positive mechanical and chemical properties, as well as superior choice with low plaque accumulation for long-term implant success.

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> Implant debridement, Titanium Wingrove L3/4 scaler by PDT, Inc.

References:

1. Apratim A, Eachempati P, Krishnappa, Salian KK, Singh V, Chhabra S, et al. (2015) Zirconia in dental implantology: A review. Journal of International society of Preventive & Community Dentistry 5(3); 147-156
2. Osman R, Swain M (2015) A Critical Review of Dental Implant Materials with an Emphasis on Titanium versus Zirconia. Materials 8(3): 932-958.
3. Al-Ahmad A, Karygianni L, Wartenhorst MS, et al. Bacterial adhesion and biofilm formation on yttria-stabilized, tetragonal zirconia and titanium oral implant materials with low surface roughness - an in situ study. J Med Microbiol. 2016;65:596-604.
4. Egawa M, Miura T, Kato T, Saito A, Yoshinari M. In vitro adherence of periodontopathic bacteria to zirconia and titanium surfaces. Dent Mater J. 2013;32(1):101-106.
5. George AM, Kalangi SK, Vasudevan M, and Krishnaswamy N.R. Chlorhexidine varnishes effectively inhibit Porphyromonas gingivalis and Streptococcus mutans – an in vivo study. Journal of Indian Society of Periodontology Vol 14 (3) July-Sep 2010.
6. Bidra A., Daubert D., Garcia L., Kosinski T., Nenn C., Olsen J., Platt J.A., Wingrove S., Chandler N.D., Curtis D. 2016 ACP Clinical Practice Guidelines for Recall and Maintenance of Patients with Tooth- Borne and Implant-Borne Dental Restorations. J Prosthodontics 25 (2016) S32-S40.
7. Wingrove S. Peri-Implant Therapy for the Dental Hygienist: A Clinical Guide to Implant Maintenance & Disease Complications 2013; Oxford: Wiley Blackwell

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