



Zirconia and Zls : Lights and shadows of two ceramic nanostructured dental materials

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Abstract:

In dentistry, metal-free prosthetic restorations have emerged as a viable treatment option showing increased aesthetic properties and adequate mechanical behavior over classical metal ceramic restorations. Among other metal-free materials, polycrystalline nanomaterials such as yttria-tetragonal zirconia polycrystal (YTZP) has excellent mechanical properties, with a broad range of indications ranging from frameworks for monolithic multi-element bridges to frameworks for single tooth crowns. Although in the last years new high translucency stabilized zirconia have been introduced for monolithic full contour restorations, they remain predominantly opaque moreover, YTZP restorations showed a considerable clinical rate of chipping and delamination of the veneered glass-ceramic. The zirconia-reinforced lithium silicate (ZLS) is a new ceramic nanomaterial recently introduced in dentistry. ZLS is based on a lithium-metasilicate (Li_2SiO_3) glass ceramic and reinforced with about 10% of zirconium dioxide (ZrO_2)₃₀ that, after final crystallization process, leads to the formation of fine grained nanostructure ($\text{Li}_2\text{O-ZrO}_2\text{-SiO}_2$). The presentation will focus lights and shadows of the two materials and their clinical performances in dentistry. Finally, will be stressed the role of the biomimetics as guideline for development of new dental materials.

Biography:

Tonino Traini, Doctor in Dental Surgery (Ph.D.- Odontostomatological Sciences; CDT-MDT Certified and Master Dental Technician), now he is an Associate professor of Odontostomatological Diseases, head of the Dental technologies Laboratory and the center for scanning electron microscopies and material sciences of the Department. Chairman for: Prosthetic and Laboratory Technologies at School of Dentistry; Dental Materials at School of Dental Hygiene; Surgical Techniques and Materials at School of Postgraduate Specialization in Oral



Surgery. He is Director of the master education program in "prostheses and implantoprotheses". Member of the scientific council of the International Piezo surgery Academy. He got his Ph.D. on the bone structure and function around dental implants. Specialist in Oral Surgery. Prof. Tonino Traini got the "lobende anerkennung das goldene parallelometer" Award in 1992, and the "Prof. Mario Martignoni" Award, Rome 2008. Currently Prof. Tonino Traini researches focus on Dental Materials and Biomaterials. Studies development of new aesthetic ceramic materials.

Publication of speakers:

1. Direct laser metal sintering as a new approach to fabrication of an isoelastic functionally graded material for manufacture of porous titanium dental implants; T Traini, C Mangano, RL Sammons, F Mangano, A Macchi, A Piattelli
2. A histologic and histomorphometric evaluation of anorganic bovine bone retrieved 9 years after a sinus augmentation procedure; T Traini, P Valentini, G Iezzi, A Piattelli.
3. Friction of conventional and self-ligating brackets using a 10 bracket model; S Tecco, F Festa, S Caputi, T Traini, D Di Iorio, M D'Attilio.
4. Maxillary sinus augmentation with BioOss® particles: A light, scanning, and transmission electron microscopy study in man; G Orsini, T Traini, A Scarno, M Degidi, V Perrotti, M Piccirilli, A Piattelli.

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