

Study Overview: CEREC Zirconia

Full Contour Zirconia: Clinically Safe, Biocompatible and No Chipping

Zirconium dioxide has been successfully used in dentistry for about 20 years. The majority are restorations with zirconia frameworks and ceramic veneers. For the past six years, fully anatomical zirconium dioxide (full contour zirconia) has been increasingly used for restorations (crowns and bridges) [1] [2] [3]. The results from in vitro tests show that with the prerequisite of a professional polish, fully anatomically shaped, non-veneered zirconia crowns and bridges are suitable for dentures. In this case, the high-performance material replaces the expensive metal casting process. In scientific literature, the material is mainly studied for its physical properties (hardness, bending and fracture strength, as well as visual appearance). As a result, monolithic zirconia significantly improved the fracture toughness of endodontically treated premolars to the level of healthy teeth [4].

The areas of application for zirconia are determined by medical need, as well as the wishes of the patient (cost, metal free). Zirconia is very positively rated as a framework material, in addition to its excellent suitability for producing abutments (and the suprastructure) for implants. The production of primary and secondary crowns made of zirconium dioxide by a CAD/CAM (computer aided design/computer aided manufacturing) system helps to simplify manufacturing processes and reduce costs [6] [7]. For restorations, its application is seen in all areas except the anterior region, including for patients with bruxism.

In addition to sturdiness, the focus of clinical studies is above all on questions regarding abrasion of antagonists, as well as the long-term behavior of the material in the patient's mouth. Here it became clear that the surface roughness of the restoration is crucial: Non-veneered, monolithic zirconia did not abrade the enamel of the antagonist when the crown surface of the restoration was free of sanding marks and has been professionally polished; therefore, the abrasion behavior is not affected by hardness, but rather by surface finish [8] [9] [10] [11]. In addition, monolithic zirconia displayed less depth of wear on the tooth enamel compared to glass-ceramic restorations [12] [13] [14].

Compared to veneered zirconium dioxide, full contour zirconia has a decisive advantage: It tends not to chip [15].

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