Zirconia Reinforced Composite—a universally applicable material with many prosthetic uses

Authors: Maximilian Kollmuß & Julia Goeke, Germany

Introduction

CAD/CAM technology opens up a wider spectrum of new materials for use in dental prosthesis. For a long time, it was not possible to treat patients with distinctive bruxism with highly aesthetic, tooth-coloured restorations. Extremely sensitive ceramics posed a constant risk of fracturing under the strain of the high forces that come with parafunctions.
This newly developed material is a combination of highly durable plastic and zirconium dioxide, which principally combines the positive features of both material groups: the acrylic content ensures a certain elasticity to the material which ideally imitates the natural elasticity of the periodontium. This is particularly beneficial with implant treatments for ensuring an even distribution of chewing forces. The addition of zirconium dioxide improves the mechanical strength of the restoration and ensures an optimal abrasion stability without the risk of exposing the antagonist to excessive forces.

The case report presented in this article is an example of the difficulties encountered when treating patients suffering from parafunctions.

Case report

The 55-year-old patient made a dental appointment, having noticed a sharp edge for quite some time by his implant crown in the upper jaw, region 15, which had been there for quite some time. The clinical examination concluded that there was a fracture in the metal-ceramic implant’s palatal veneering. Furthermore, the patient appeared to have noticeable evidence of grinding on the majority of teeth. When asked, the patient admitted to grinding and pressing his teeth, particularly at night.

The implant had been inserted in July 2010 and indicated an inconspicuous percussive resonance with no signs of a peri-implant infection. A x-ray was carried out as a safety precaution and similarly showed no pathological findings.

It was discussed together with the patient that a new implant crown should be fitted, using a material better suited to the patient. At this point, the option of a new, innovative material came to mind: a highly durable acrylic, reinforced with zirconium dioxide (Tizian Zirconia Reinforced Composite, Schütz Dental).

After the fractured crown had been removed, the situation was as follows with uninflamed mucosa:...
An impression was made using an especially customised tray and a corresponding impression post, which fitted with the implant. The situation was then transferred to the master model using an individual gingival mask and a scan of the model was made using the Tizian Smart-Scan system for a CAD reconstruction of the crown. The crown was constructed on Tizian Creativ RT-Software, which lets you take the most natural occlusal surface into account.

Following this, the crown was milled out of Tizian Zirconia Reinforced Composite in the milling machine (e.g. Tizian Cut 5 smart, Schütz Dental).

Next, the crown was veneered with a veneering composite (dialog Occlusal, Schütz Dental) following the Cut Back technique.

The restoration was prepared for the screw joint using a bonding base for full ceramic restorations.

After the crown had been fitted, the approximal contacts checked and minimal corrections were made to the occlusion, the crown was polished. Then the crown was definitively integrated using a torque wrench at a speed of 35 Ncm.

The screw was then secured with a highly aesthetic composite (NanoPaq Composite, Schütz Dental) and the screw channel was fastened.

Taking note of the patient’s existing ceramic restorations, the patient was advised to have a bite tray made.

In order to monitor the success of their prosthetic treatment, the patient was asked to attend a follow up appointment every six months.

**Conclusion**

With the zirconia reinforced composite from the company Schütz Dental, the option of a highly aesthetic material for treating implants and patients suffering from parafunctions is now available. Thanks to the material’s physical properties, the dot-shaped chewing forces are evenly spread across the whole restoration. The final pictures show the harmonious integration of the restoration into the patient’s current situation. Excellent material properties ensure a high level of comfort for the patient, as well as high stability and durability of the restoration.

---

**Editorial note:** This report is not intended as a user manual. Please consult the user manual for the systems and materials mentioned above. All rights lie with the treating dentist.

---

**Authors**

Maximilian Kollmuß and Julia Goek

Poliklinik für Zahnheilkunde und Parodontologie
Dental Clinic of the University of Munich

Dental technician: MDT Robert Kollmuß
Dentaltechnik Kollmuß GmbH, Munich, Germany