As veneered zirconia restorations based on 3 mol% yttria-stabilized tetragonal zirconia polycrystals (3Y-TZP) have shown ceramic chipping,1 dentistry has witnessed a shift toward monolithic zirconia restorations. Monolithic restorations not only eliminate the risk for chipping, but also show reduced antagonistic wear, require less material thickness, and facilitate the fabrication process compared to veneered restorations.2 The trend toward monolithic restorations drove the development of novel translucent generations of zirconia ceramics. Recently introduced translucent zirconia ceramics owe their translucency to an elevated yttria content of up to 5 mol%. These partially stabilized zirconia ceramics (4/5Y-PSZ) show increased translucency compared to 3Y-TZP but also diminished fracture toughness (0.6 to 0.7 GPa for the ceramic applied in this case report2), limiting the indication range to, at maximum, three-unit fixed dental prostheses (FDPs) including one intermediate pontic2,3 (see also ISO 6872–2015). Although various 4/5Y-PSZ ceramics have been introduced to the market, knowledge on the clinical outcomes of these restorations remains sparse. The present case history report presents a patient who received monolithic 5Y-PSZ zirconia restorations.

CASE HISTORY REPORT

A 54-year-old healthy male patient presented at the authors’ department asking to improve the masticatory function and esthetics of his teeth. The dental examination revealed that teeth 15, 26, and 37 (FDI) were missing and that multiple teeth had insufficient restorations. Anterior teeth in the maxilla showed noncarious lesions in the cervical region, and 38 was hopeless due to deep caries (Fig 1). Periodontal and...
Fig 1  Photographs and orthopantomogram of the situation before prosthodontic treatment.
functional statuses were inconspicuous. The patient preferred to replace the missing teeth 15 and 26 with FDPs, whereas 37 was planned to be restored with an implant-supported single crown (SC). Tooth-supported SCs were planned for 13, 36, and 47, partial crowns for 17, 35, and 46, and inlays for 24 and 35. Abutment teeth were prepared with a circumferential chamfer for the FDPs and SCs, and teeth receiving partial crowns and inlays were prepared in a minimally invasive, defect-oriented way (occlusal reduction: 1.5 mm, axial wall reduction: 1 mm; 0.8-mm–deep chamfer) (Fig 2). The implant (SiCace 4 × 9.5 mm, SiC invent) was digitally backward planned and inserted (T.F.) using a printed drill template (SMOP, Swissmeda). Impressions were taken using a polyether-based elastomeric impression material (Impregum Penta, 3M). Interocclusal registration was performed using an A-silicon–based bite registration material (Futar D, Kettenbach). The Natural Head Position\textsuperscript{4} was registered by the PlaneFinder system (Zirkonzahn) to accurately transfer the inclination of the

![Fig 2 Preparation of the teeth.](image1)

![Fig 3 Digital design of the monolithic restorations reflected on prefabricated zirconia blanks and the final restorations individualized by staining and glazing.](image2)
Fig 4  Photographs and orthopantomogram of the situation after prosthodontic therapy. Due to the delayed loading protocol, the implant was restored 3 months after restoration of the teeth.
occlusal plane and to avoid adjustments of the restorations’ shapes. To further minimize the need for adjustments, the bite was double-checked with a registration jig fabricated on the master casts. The monolithic restorations were designed digitally, milled out of 5Y-PSZ blocks (Prettau Anterior, Zirkonzahn), dyed (Colour Liquid Prettau Anterior Aquarell, Zirkonzahn), and sintered (sintering oven: Zirkonofen 600/V2, Zirkonzahn) (Fig 3). After a satisfying try-in, the restorations were individualized by staining and glazing (IPS E.max Ceram Essence and IPS E.max Ceram Glaze Paste, Ivoclar Vivadent). Teeth-supported restorations were inserted using dual-curing composite resin luting cement (Panavia V5, Kuraray) following airborne-particle abrasion, and the screw channel of 37 was sealed using Teflon tape and a composite (Tetric EvoCeram, Ivoclar Vivadent) (Fig 4). Noncarious lesions of the anterior maxilla were restored (O.P.) using direct composite restorations (Enamel Plus HRI, Micerium S.p.A).

After 1 year in service, the patient is still highly satisfied. Except for the decementation of one inlay, which could be recemented successfully, no technical or biological complications occurred.

DISCUSSION

This case report demonstrates that monolithic 5Y-PSZ restorations show a satisfying esthetic outcome and low complication rates for a broad range of restoration types after 18 months in service. Although restorations of 5Y-PSZ reach high in vitro bond strengths, the debonding of one inlay gives rise to the question of whether sufficient retention was achieved with the applied preparation and cementation techniques. As flexural strength of 5Y-PSZ is reduced compared to 3Y-TZP, it appears essential to study how preparation design and cementation affect the long-term outcomes of 5Y-PSZ restorations.

CONCLUSIONS

Monolithic 5Y-PSZ restorations seem to represent a minimally invasive, esthetic treatment alternative to veneered zirconia restorations that might be less susceptible to technical complications. Long-term clinical validation is necessary.

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