Z-SYSTEMS—a 17-year follow-up

Z-SYSTEMS

Kian Dilmaghani, MSc Impl., established his dental practice, namely Schifflände GmbH, in 2005 in Basel, Switzerland and was one of the first users of the zirconia implant developed by Z-SYSTEMS. He has extensive training in treating functional disorders of the masticatory apparatus and the musculoskeletal system. The focus of his professional expertise is the holistic approach to dental care, a pivotal factor in his preference for zirconia. Meanwhile, zirconia has solidified its position as a widely accepted and trusted choice in implant dentistry.

We aim to illustrate the outstanding long-term performance of Z-SYSTEMS' zirconia implant through two clinical cases. In both instances, a one-piece zirconia implant was utilised for a single-tooth restoration in the mandibular posterior region 17 years ago. Following surgical insertion of the implant and adaptation of the wound margin with single sutures, the exposed implant abutment was shortened by wearing off the outer hexagon. To protect the implant and its transgingival portion during the healing phase, an impression of the situation was taken in the same session to fabricate a protective temporary restoration. The protective temporary restoration, made of non-precious metal, was designed in the form of a double brace. It was manufactured in the dental laboratory within 24 hours and bonded to the adjacent teeth of the interdental gap on the subsequent day. The temporary restoration was designed with a depression in the area of the implant abutment to prevent external forces from acting on the implant during the healing process.

Further aspects that need to be considered, particularly in the mandible, are the biomechanical phenomena that occur in a unilateral loading situation due to the protection of the surgical site. Implant bed preparation primarily weakens the mandibular segment in the region of the interdental gap and subjects it to a greater torsional potential. This increased torsional potential in the affected area could be detrimental to the osseointegration process of the implant, representing a risk factor. By securely bonding the protective temporary restoration to the neighbouring teeth, it effectively splints and immobilises the mandibular segment that was weakened by the implant placement, thereby counteracting the torsional forces.

The two cases of single-tooth restoration using one-piece zirconia implants are presented in the following:

Case 1


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02


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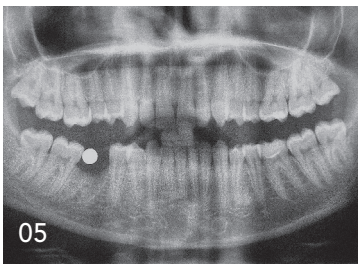
04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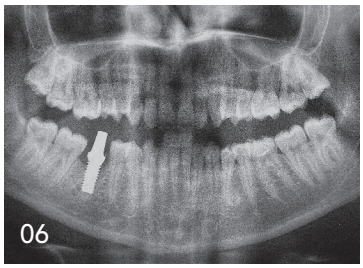
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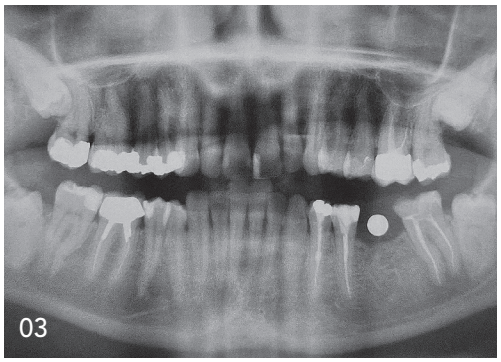
Case 2


01


02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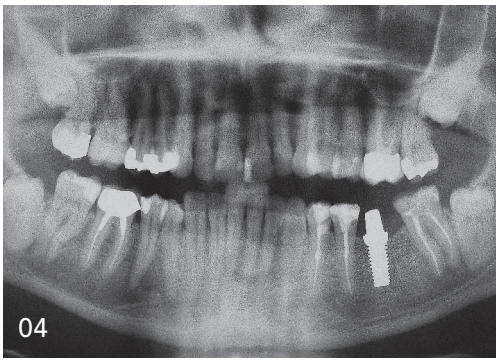
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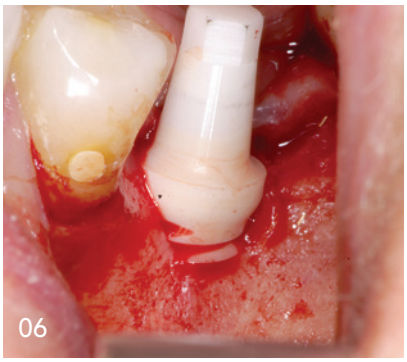
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Conclusion

These two clinical cases demonstrate that long-term success was achieved due to the surface quality and implant geometry of Z-SYSTEM implants. Despite suboptimal implant placement, vestibular bone supply and prosthetic restoration, both implants have maintained functionality for a period of 17 years!

In patient No. 1, the implant site in region 46 exhibited a vestibular bone deficit. While efforts were made to augment the defect using autologous bone obtained during site preparation, which was covered with a mucoperiosteal flap, the primary complete wound closure was not possible due to the transgingival portion of the implant. A comparable procedure with a titanium implant would be inconceivable. Additionally, the vertical position of the implant was suboptimal as it could have been placed 1.5 mm lower.

In contrast to patient No. 1, the implant in patient No. 2 was positioned approximately 1.5 mm under the recommended margin. Consequently, the transition from the implant crown to the implant shoulder was lower than the optimal biological width of the adjacent teeth. Exposure of the implant shoulder by lasering is not recommended, as this provokes unnecessary mucosal scarring and reduces moisture penetration.

This underscores the exceptional biocompatibility of Z-SYSTEMS' zirconia implants, which demonstrate remarkable resilience, even in cases where suboptimal conditions were inadvertently created. Indeed, this is a positive indication of the long-term stability of the implant site.

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