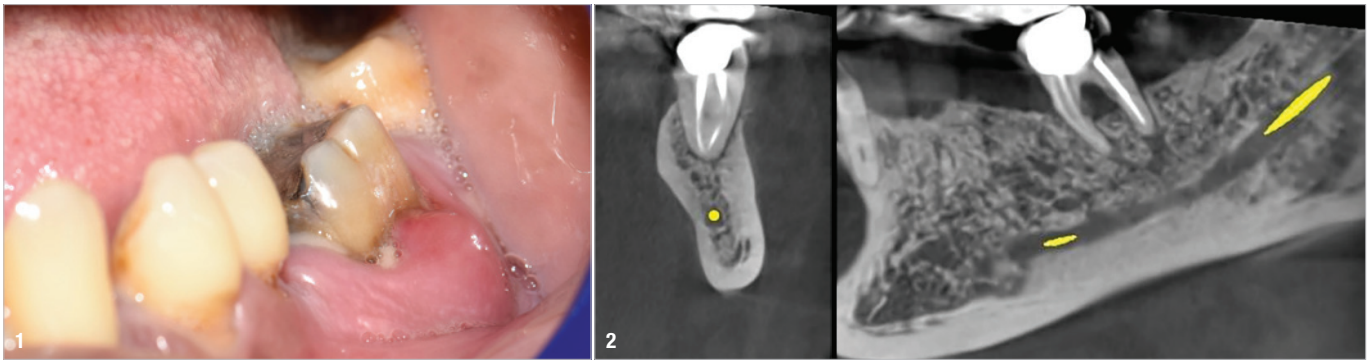
Restoring natural aesthetics in the posterior mandible

Dr Saurabh Gupta, India

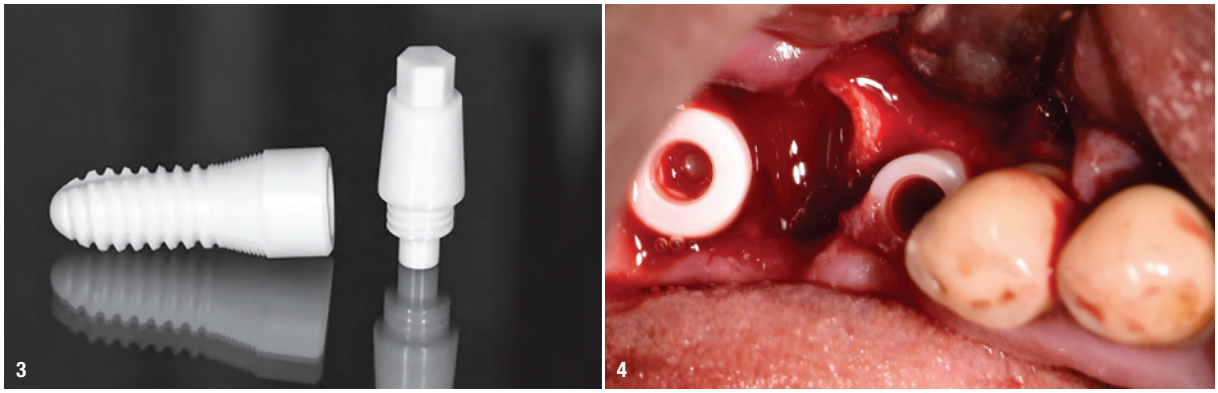


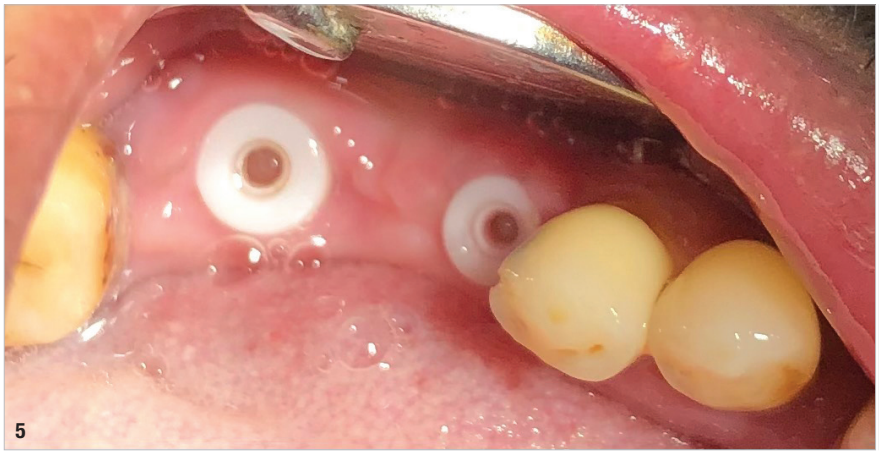
Introduction

Zirconia implants have established a strong presence in implant dentistry. Patient demand for metal-free solutions is increasing, and the development of new biomaterials, micro-rough surface techniques and improved treatment protocols has enabled practices to use zirconia dental implants as a reliable treatment alternative to titanium dental implants. Multiple studies have proved that zirconia implants induce little to no peri-implant tissue inflammation and allow for high levels of epithelial attachment. Additionally, these implants are more natural-looking; hence they provide improved aesthetics. Furthermore, they do not have metal components, which makes them ideal for people with metal sensitivities and patients who would prefer their implants to be metal-free. The patient should be informed about the pros and cons of both material options and involved in decision-making if a zirconia implant is presented as a treatment option.[1–5] This case report describes the replacement of mandibular posterior teeth with zirconia dental implants.

Clinical situation and treatment planning

A 47-year-old healthy male patient presented at my clinic requesting restoration of a missing premolar (tooth #35) and a solution for an endodontically infected molar (tooth #36; Fig. 1). The premolar had been extracted about ten months before, and the molar had been endodontically treated seven years before. The CBCT examination showed a fully healed site #35 and an endodontic and periodontic lesion affecting tooth #36 (Fig. 2). Tooth #36 was planned for extraction. The patient was informed about ceramic implants as an alternative to titanium implants and the AWI zirconia dental implant system (WITAR) as a metal-free solution. After a detailed explanation and





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discussion, the patient decided on this treatment option. The main reason for his decision was the prognosis of less inflammation of the peri-implant tissue with ceramic implants and a metal-free solution.

Surgical and restorative protocols

Curettage and laser debridement with a 940 nm wavelength diode laser (BIOLASE) of the alveolar socket was performed after extraction of tooth #36. Surgical guidelines for the drilling protocol were followed, and two-piece zirconia dental implants (AWI G-Line) of sizes 3.9 × 12.0 mm and 4.5 × 10.0 mm were used for the replacement of teeth #35 and #36 (Figs. 3 & 4). Both implants were inserted with the connection level supragingival to a torque of 35 Ncm. The transgingival shoulder with its smooth surface provides the optimal conditions for soft-tissue adhesion. Primary stability was achieved. The implants were covered with cover screws *in situ*, and the site was closed without any grafting procedure. Four months after surgery, the restorative process began with removal of the cover screws and placement of straight cementable zirconia abutments with external threads (Figs. 5 & 6). The abutments were screwed and cemented with glass ionomer cement (SHOFU) for a permanent abutment–implant connection. The glass ionomer cement was applied only to the external threads and was torqued to 15 Ncm. The abutments were prepared like a natural tooth with red-ring diamond burs, followed by a conventional impression taking procedure for definitive restoration.

The soft tissue was healthy and keratinised around these abutments when direct impression taking was performed (Fig. 7). Monolithic zirconia crowns were selected as the prosthetic solution (Fig. 8). To achieve a tension- and bending-free connection between the restorations and the implants, the zirconia restorations were cemented intra-orally to the abutments according to the standard procedure using glass ionomer cement (Figs. 9a & b).

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9a

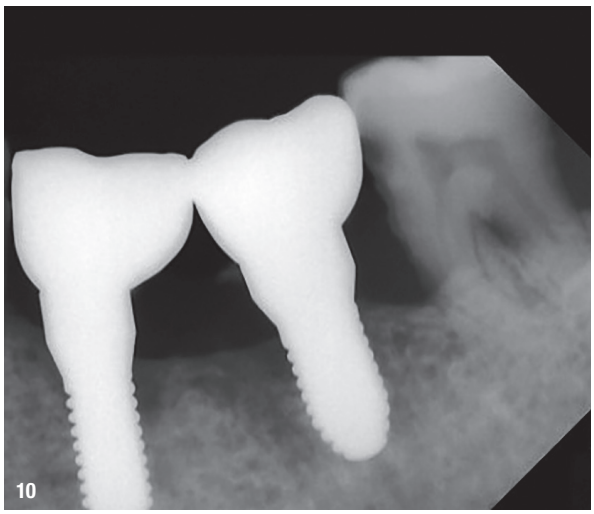

9b

Clinical outcomes

The result was beautiful with excellent tissue healing, and the patient was highly satisfied. No inflammation or prosthetic problems occurred during the follow-up period. The result in this case was metal-free implants and crowns (Fig. 10).

Conclusion

The AWI dental implant system is designed for a broad range of indications, from single units to multiple units. It performed extremely well in the case presented, with conventional and immediate implant placement in the infected socket. The surgical and prosthetic protocols are comparable to those of titanium implants. These are important factors for the successful integration of a new dental implant system in the daily dental practice. My main reasons for using the AWI dental implant system in the case presented were as follows: the implant used is designed to support a natural soft-tissue appearance, especially for patients with a thin mucosal biotype; zirconia generally shows lower plaque accumulation and bacterial adhesion than does titanium—the surface of these implants is micro-rough and hydrophilic for successful osseointegration, while the implant collar is partially machined, designed for excellent soft-tissue attachment and a low inflammatory response; these implants also provide a mechanical strength advantage: they are made out of yttrium tetragonal zirconia polycrystals, which yields improved hardness, bending strength and toughness; they offer great restorative flexibility owing to the two-piece, cemented internal connection design; conical micro-threads in the area of the cortical bone allow better primary stability and axial loading; the clinical protocol is comparable to that of titanium implants; and it is a metal-free solution, as even the screw threads are incorporated on abutment with strong ceramic-to-ceramic connection, which is highly biocompatible.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about the author

Dr Saurabh Gupta graduated from Manipal College of Dental Sciences in India with a BDS and holds a master's degree in oral and maxillofacial surgery from Rajiv Gandhi University of Health Sciences in Bangalore. He is an international and national lecturer and a board member and global education and training manager of the International Academy of Ceramic Implantology. He is a member of the Zirconia Implant Research Group, which aims to orient and lead research in the field of metal-free implantology. He founded and directs WhiteZ Dental in Bangalore.

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References

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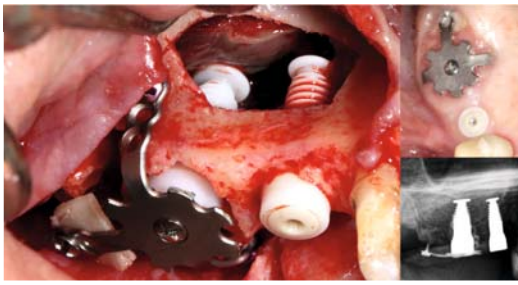

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