Ceramic implant placement in a high-load posterior situation

A case report with four years of follow-up

Dr Alexandr Bortsov, Russia

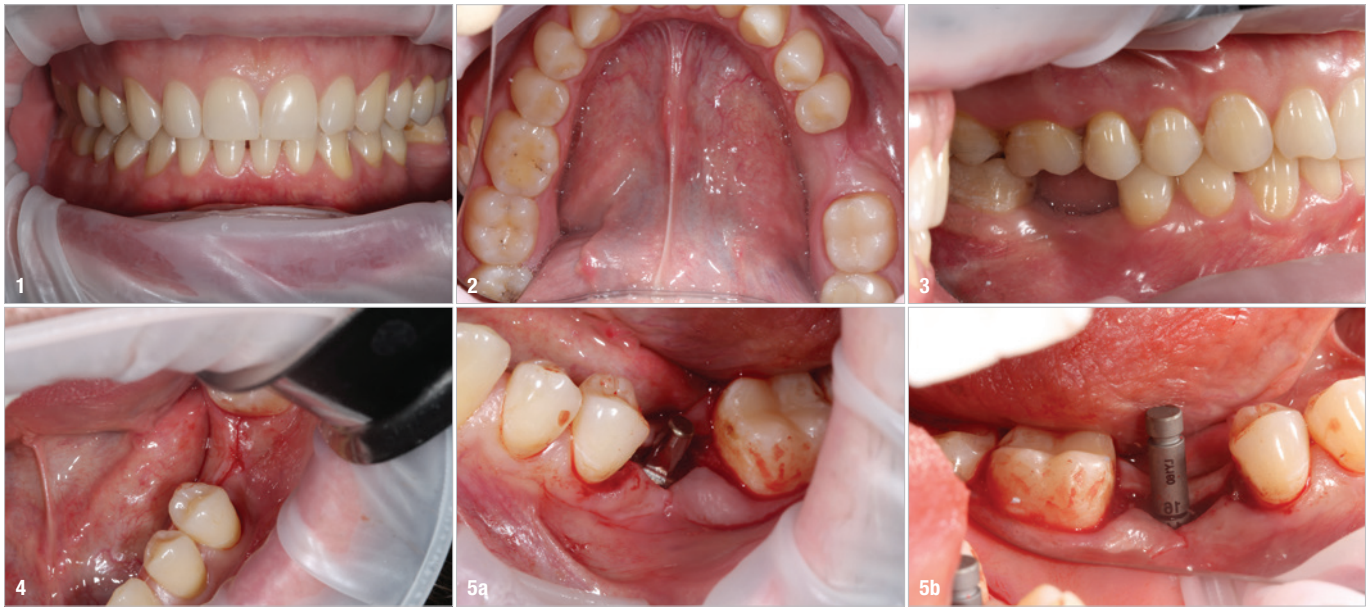

Fig. 1: Initial situation, frontal view. **Fig. 2:** Initial situation, occlusal view. **Fig. 3:** Initial situation, lateral view. **Fig. 4:** Incision. **Figs. 5a & b:** Checking implant position **(a)** and depth preparation **(b)**.

Dental implantation has become a mainstream treatment option, and most clinicians use titanium and titanium alloy implants in their practice. There is a growing patient demand for reliable, metal-free and naturally looking dental implants. Although niche, such demand is particularly pronounced in patients with a heightened allergic status who desire a highly aesthetic outcome. Zirconia implants are emerging as a viable solution to meet the demands of these patients. Clinically, ceramic implants offer the advantages of a natural tooth and root colour, superior soft-tissue healing and a reduced tendency to accumulate plaque. However, the patient concerns are usually centred on the mechan-

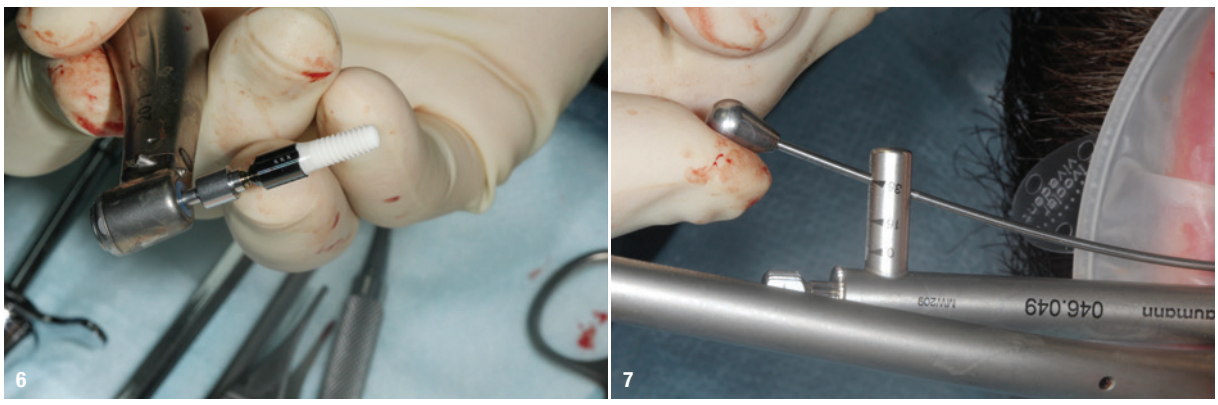

Fig. 6: Implant pick-up. **Fig. 7:** Inserting the implant with a torque of 35 Ncm.

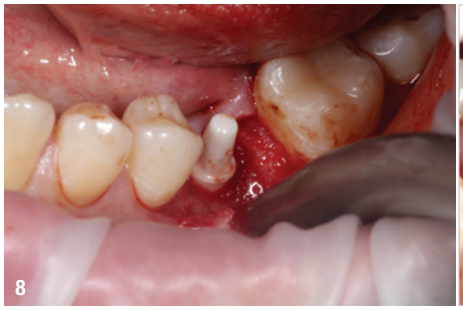
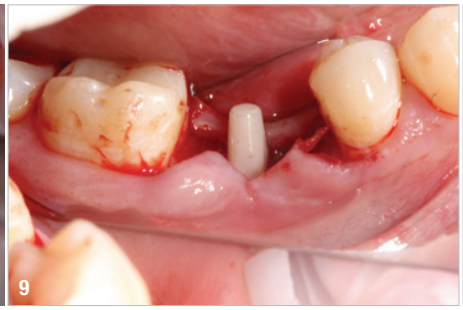
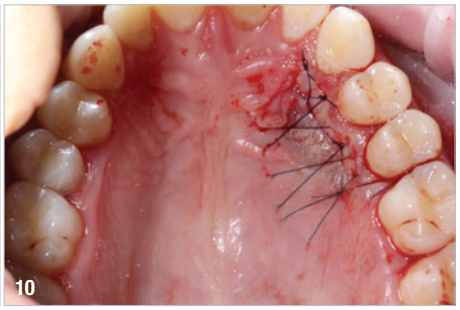

Fig. 8: Implant in final position. **Fig. 9:** Implant in final position, lateral view. **Fig. 10:** Suturing of the graft site.

ical stability of ceramic implants, particularly in the molar region with high masticatory forces. This clinical case report shows the 4-year follow-up of a Straumann® PURE ceramic implant placed to restore the first molar in the mandible.

Initial situation

A 32-year-old patient with a history of metal allergy and a heightened allergic status (increased IgE levels), without parafunctional habits, presented at the clinic for the replacement of missing tooth #36. The tooth had been removed more than five years ago and the patient had avoided restorations due to concerns about metal allergy. The patient wanted to have a metal-free restoration with a highly aesthetic outcome. The patient was also concerned about the functionality and mechanical strength of the restoration.

Treatment planning

During the clinical examination and the analysis of the radiographic image in the area of the extracted tooth, a combination of horizontal bone atrophy and a thin gingiva biotype were determined at the planned implant site (Figs. 1–3). The vertical bone dimension allowed the placement of an implant with 4.1 mm in diameter and 10 mm in length. Given the patient's medical history, high aesthetic expectations and the thin gingiva biotype, it was decided to place the Straumann® PURE monotype ceramic implant. To optimise the soft-tissue volume, soft-tissue augmentation with a direct temporary crown was planned. The Straumann® PURE Monotype Ceramic Implant with full-ceramic crown would, in this clinical case, provide a metal-free, aesthetic and mechanically strong restorative solution.

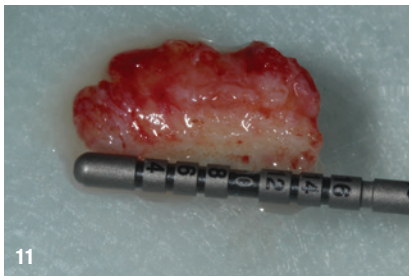
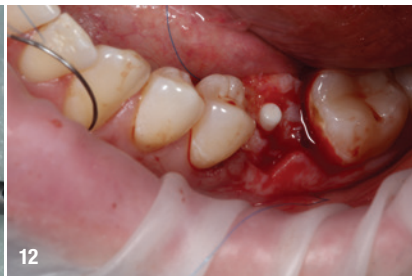

Fig. 11: Soft tissue graft. **Fig. 12:** Fixation of the soft tissue graft.

Surgical procedure

Under local anaesthesia, a marginal incision to reflect a mucoperiosteal flap was made at the intervention site (Fig. 4). The basic and fine implant bed preparation was done according to the Straumann® PURE Monotype surgical protocol. Since the implant is a one-piece monotype, the position indicator was carefully used to ensure the correct final position of the implant (Fig. 5a). A depth gauge was used to calculate the implant immersion depth (Fig. 5b). The use of a profile drill during the fine implant bed preparation avoided excessive compression of the cortical bone and facilitated the insertion torque of 35 Ncm (Figs. 6 & 7). To create an optimal soft tissue volume and attachment, the implant was placed 1.8 mm above the edge of the alveolar bone (Figs. 8 & 9).

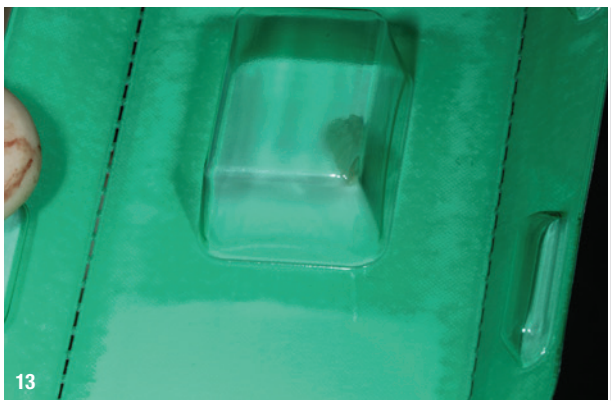
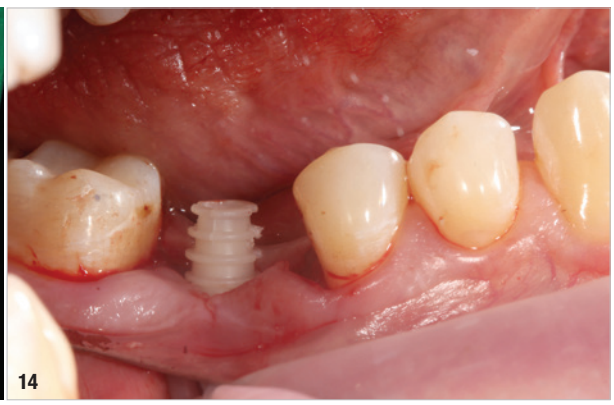

Fig. 13: Provisional coping. **Fig. 14:** Checking the fit of the provisional coping.


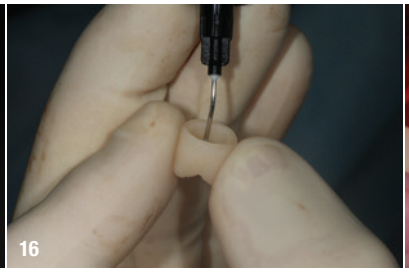
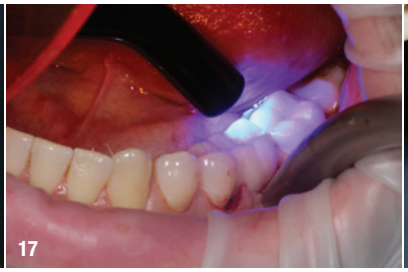


Fig. 15: Spacing of the provisional crown. **Fig. 16:** Filling up the provisional crown with relining material. **Fig. 17:** Provisional crown–light-cure bonding to coping. **Fig. 18:** Finishing and polishing of the provisional crown.

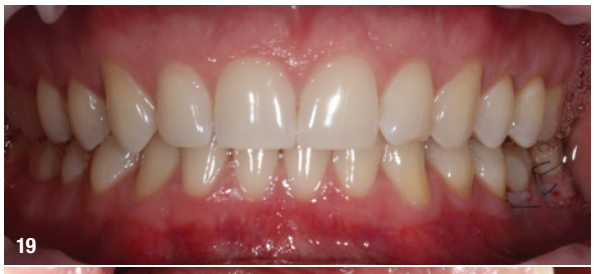
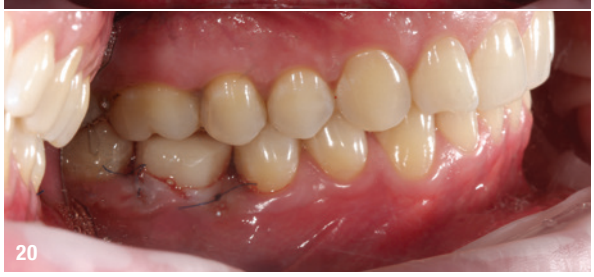

Fig. 19: Provisional crown in place, frontal view. **Fig. 20:** Provisional crown in place, lateral view.

The palatal region was selected as the donor area for the harvesting of the subepithelial connective tissue graft (Fig. 10). The isolated soft tissue graft (Fig. 11) was fixed with 5/0 interrupted sutures in the recipient area (Fig. 12).

Prosthetic procedure

Conventional closed-tray impression taking was done using the PURE Impression Cap. Immediate temporisation was planned. The provisional crown was made using the wax-up method with silicone key and the PURE Temporary Coping (Figs. 13 & 14). The provisional crown was made from the Luxatemp material and was then fixed (Figs. 15–18). The tissue-level design of the transgingival collar of the PURE Monotype, together with the temporary crown, effectively facilitated the soft tissue management and ensured that the tissue healing was not disturbed at any time after implant placement (Figs. 19 & 20). Such a built-in emergence profile helps make the prosthetic procedures straightforward. After 4 months, the final full-ceramic e.max® crown was fabricated and fixed.

Treatment outcome

The patient was satisfied with the functional and aesthetic outcomes and attended annual follow-ups. The 4-year follow-up showed a healthy volume of peri-implant soft tissues and the radiographic examination revealed stable marginal bone levels (Figs. 21–24).

about the author

Alexandr Bortsov, DDS is a prosthetically active surgeon. His focus areas are Implantology and Guided Surgery, Aesthetic Dentistry, and Digital Dentistry. He graduated in Dental Surgery from the State University of South Ural MoH, Russia. Dr Bortsov is the Director of the "Dental Art" clinic in Chelyabinsk, Russia. In addition, he is the Director of the ITI Study Club, also in Chelyabinsk, Russia.

contact

Dr Alexandr Bortsov
+7 905 8398504
89058398504@mail.ru

Author details

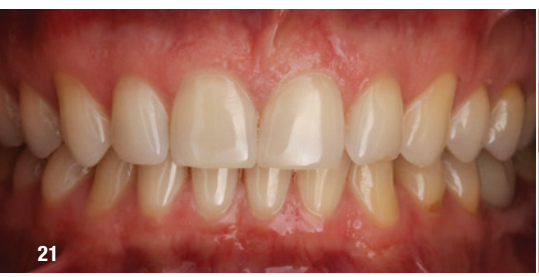
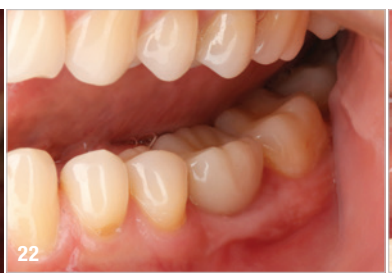
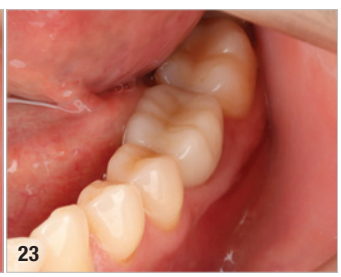
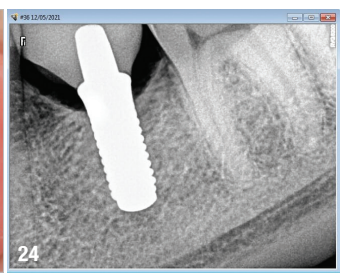

Fig. 21: Final crown after 4 years, frontal view. **Fig. 22:** Final crown after 4 years, lateral view. **Fig. 23:** Stable soft tissue volume, 4-year follow-up. **Fig. 24:** The control radiograph at the 4-year follow-up showed stable bone levels.

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