

**Fig. 1:** Free-end situation in regions #26 and 27. **Fig. 2:** Preoperative three-dimensional planning. **Figs. 3 & 4:** Straumann® PURE Ceramic Implant. **Fig. 5:** Surgical situation with cover screw. **Fig. 6:** Post-op radiograph. **Fig. 7:** Situation after exposure. **Fig. 8:** Healthy marginal gingiva. **Fig. 9:** Taking an impression with an open impression post.

# Single-tooth restoration of an upper molar with a ceramic implant

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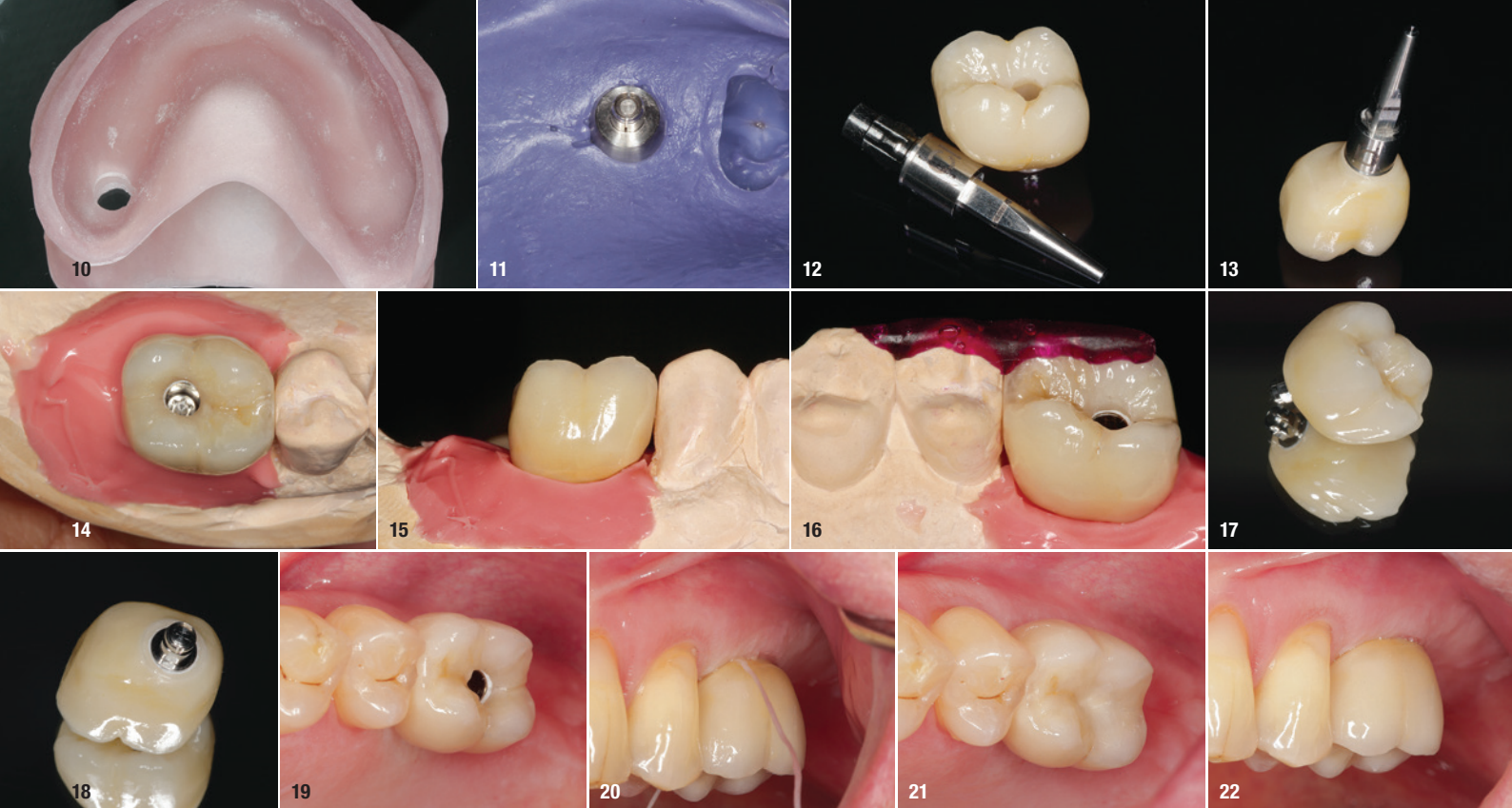
## Baseline

A 60-year-old man presented with a free-end situation in regions #26 and 27 which had been this way for about eight years. Three years ago, a PURE Monotype was successfully implanted in position 36 and fitted with a prosthetic restoration. His dental hygiene was excellent and region 36 was not irritated in any way. The patient now wanted to treat position 26 with a ceramic implant without major surgical intervention. 3D imaging (CBCT) showed sufficient transverse bone and a vertical height of approximately 5–6mm to the maxillary sinus and thus, the use of a two-piece implant with an internal sinus lift was planned. The poor vertical bone supply and the reduced quality compared with the lower jaw would have posed a risk for successful osseointegration, if a single piece implant with transgingival healing had been selected. In preparation of the treatment a mild basal mucosal membrane swelling was checked

by an ENT specialist and the patient performed nasal irrigation on a daily basis.

## Surgical procedure

Following local anaesthesia, a crestal incision was made with only minimal mobilisation of the mucoperiosteal flap. For the internal sinus lift (performed according to the Summers technique), the pilot marking stops approximately 1 mm short of the margin of the maxillary sinus and is then widened with various osteotomes (Straumann Institute) depending on bone availability and quality. Here, it is essential that the Schneiderian membrane is regularly checked via a “Nasal patency test” to ensure that it is not perforated during the procedure. Following the successful preparation of the bony bed, an implant size 4.1/10mm was inserted with very good primary stability. This was followed by wound closure with 5/0 monofilament sutures. After



**Fig. 10:** Ideal customised tray. **Fig. 11:** Impression. **Fig. 12:** Zirconium crown & PUREbase on implant analogue. **Fig. 13:** Fit from basal direction. **Figs. 14 & 15:** Model situation. **Fig. 16:** Customised bonding aid. **Fig. 17:** Finished restoration. **Fig. 18:** Clean bond between base and zirconium crown. **Fig. 19:** Try-in. **Fig. 20:** Check efficient hygiene capacity. **Fig. 21:** Final result with occlusion. **Fig. 22:** Final result.

four months the minimally invasive exposure was performed with application of the gingiva former.

## Prosthetic procedure

The implant position was transmitted to the dental laboratory with a customised open tray impression procedure and a stable polyether material. The alignment of the implant allowed a trans-occlusal screw-retained, veneered zirconia crown to be produced on a bonding base. What sets the construction apart is the fact that the metal on the bonding base is completely encased in zirconium in the finished construction. This demands outstanding technical precision and the use of a special “bonding aid” in the laboratory. For the first try-in of the crown in the patient we initially only secure the crown temporarily to the bonding base. This ensures that it is easily removed and can be refired if any correction is required. If the crown is completed in terms of the shade and shape, it is important to ensure that the final bonding is exactly in the same position on the bonding base as the previous try-in. To do this we produce a plastic key. Before the crown is integrated the hygiene capacity is checked and the restoration is tested to ensure that in future no traumatic forces can be exerted on it in occlusion and articulation. After applying the necessary torque, the screw channel is filled with Teflon tape and occlusion is achieved with composite.

## Conclusion

The reduced bone availability in the posterior region of the maxilla demands that the implantology is adapted. The

internal sinus lift technique is the established minimally invasive approach, although this harbours a risk in the healing phase for single-piece implants, depending on the volume and quality of the residual bone. The PURE implant is a perfect solution in this case, as optimum healing can be achieved with a submerged approach. In combination with the tried and tested, slightly modified Variobase, a functionally and aesthetically pleasing outcome is achieved.

## about the author



**Dr Frank Hoffmann** is a Hamburg-based specialist in implant dentistry, periodontics, and aesthetic dentistry. He obtained his degree in dentistry at Hamburg University in 1988 and completed his PhD in 1989. Since 1991, he is leading his own practice in Hamburg in Germany, which has been growing through adding partners. He is a speaker

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