IPS e.max CAD and Zenostar: Monolithic brothers
Fabricating individualised monolithic restorations

Dr Petr Hajný
Czech Republic

Aesthetic and functional reha-
bilitisation of the anterior den-
tal arch and occlusal height can be completed in a single day using IPS e.max CAD (Ivoclar Vivadent) lithium di-
licate ceramics in combina-
tion with CAD/CAM technol-
y. In this case, the CEREC system (Sirona) was used. The articulation was assessed with help of T-Scan technology (Tekscan), which provided excellent results.

Until recently, closing lateral gaps in patients who refuse implant therapy posed a problem with timescales for us. For these cases, zirconia bridges proved to be a valuable solution. In order to be able to treat our patients within a few hours, 48 hours at maximum, we were looking for a means of speeding up, or simplifying, this treatment modali-
ty. After considering the results of scientific studies investigat-
ing the surface properties and wear of various polished mono-
lithic zirconia restorations, we decided to use the Zenotec CAD/CAM system (Wieland Dental), as it allowed us to mill even extensive bridges from zir-
conia. In this case, a 60-year-old fe-
male patient presented to our practice complaining about the colour and length of her teeth. They had previously been re-
stored with metal-ceramic crowns in the anterior and bridges in the posterior region, and were completely invisible during speaking and smiling (Figs. 1–3). The patient desired a very bright smile, a Hollywood white smile. She refused im-
plant therapy to close the gaps in the posterior region. For this reason, we decided to use all-ce-
ramic bridges. The plan was to manu-
facture a bridge spanning from tooth #25 to 28, a cantilever bridge from tooth #33 to 35 with a pontic at tooth #36 and a bridge from tooth #43 to 47. A try-in was performed without any problems and additional ad-
justment was necessary. The occlusal contact points were polished (Fig. 9).

Clinical procedure
After removing the existing restorations, we inserted FRC Postec (Ivoclar Vivadent) glass-fibre-reinforced composite root canal posts into teeth #21, 23, 35, 44 and 45. This was followed by the placement of MultiCore Flow (Ivoclar Vivadent) core build-up composite. As the next step, we replaced all existing single restorations with crowns made of IPS e.max CAD milled with the CEREC MC XL CAD/CAM system and IPS e.max CAD LT blocks in the shade BL2 (staining technique). The oc-
clusal height was raised on the same day and temporarily sta-
bilised with Telio CAD (Ivoclar Vivadent) bridges.

The anterior mandibular teeth were restored with lamin-
ate veneers made of IPS e.max CAD (staining technique). Prior to placing the Telio CAD bridges with Telio CS Link (Ivoclar Vi-
adent), impressions were taken using Virtual 380 (Ivoclar Vivadent). A bite record of the new vertical dimension was taken with Virtual CADbite (Ivoclar Vivadent) silicone ma-
terial. The bridges were manu-
factured using a Wieland scan-
ner and a Zenotec mini-milling unit.

The restorations were de-
signed with SShape software (Figs. 6–4). In order to recon-
struct the bridge from tooth #25 to 26, the caniner, the first premu-
lar and the second premolar of the first quadrant were milled,
whereas the first molar was reconstructed on the basis of data retrieved from the SShape library. From the beginning, the contours of the molar were very clear and detailed. Therefore, no additional manual tissue ad-
justment was necessary. The restorations were milled, sintered in a Programat S1 furnace (Ivoclar Vivadent) and then cus-
tomised by applying stains from the Zenostar Art Module in the staining technique. Finally, the occlusal contact points were polished (Fig. 9).

On the second day, the tem-
porary Telio CAD bridges were removed and the teeth were cleaned with chlorhexidine-containing Cervitec Liquid (Ivoclar Vivadent) mouthrinse. A try-in was performed without any problems and additional ad-
justment was necessary. The occlusal contact points were polished (Fig. 9).
Adjustments were not required. The restorations were then cleaned with Ivoclean and silanised with Monobond Plus (Ivoclar Vivadent). The preparations were pre-treated with Multilink Primer A and B and then seated using Multilink Automix luting composite (yellow shade; both Ivoclar Vivadent). After the luting composite had been cured with a Bluephase (Ivoclar Vivadent) curing light and the excess material had been removed, the restorations were permanently cemented in place by activating the Turbo mode of the curing light a number of times. Articulation and occlusal contact points were assessed with a T-Scan device and then the occlusal surfaces were polished (Figs. 10 & 11).

Conclusion
A slight difference in brightness between the Zenostar zirconia bridges and the IPS e.max CAD crowns was noticeable. With hindsight, we would adjust the shade of the Zenostar framework with Zenostar Color Zr (Ivoclar Vivadent) colouring solution before conducting the sintering process to adapt the brightness level in such cases. As an alternative, a pre-shaded block could be used instead of adjusting the shade later by means of the staining technique.

For the patient, her new bright smile was simply a wish came true (Figs. 12 & 13). From our point of view, the 5Shape software was very efficient in completing the rehabilitation. Tooth shapes were easy to copy. An initial proposal for the design of the occlusal surface of the posterior teeth was immediately available and could be adjusted quickly and predictably. The restorations showed a smooth surface and clearly contoured fissures both on the screen and after milling in the four-axis milling unit. As further adjustments were not necessary, we were able to seat the restorations straightaway. Monolithic zirconia restorations have shown similar, if not lower, levels of enamel wear on antagonists to other ceramic restorations in clinical applications. By using monolithic restorations, we are able to complete certain cases in a single day. If we consider a recent investigation that evaluated the enamel wear caused by monolithic zirconia crowns and other ceramic materials and compared these results with the enamel wear caused by natural antagonists, we may conclude that we chose a functional and sensible solution.

Reference