In 1985, Prof Werner Mörmann, Dr Marco Brandsttini and their team laid the foundations for a new treatment system consisting of optical impression-taking, CAD and numerically controlled milling.

This new concept motivated large numbers of clinicians and prompted them to carry out their own follow-up investigations. Today, CEREC is one of the most closely scrutinised dental procedures, a fact reflected in more than 250 clinical studies and approximately 6,500 longitudinal studies of restorations.

Long-term observations indicate that adhesively bonded restorations fabricated using the first versions of the CEREC system (CEREC 1 and 2) achieved higher survival probability rates (according to Kaplan–Meier) than conventional layered ceramic restorations. CEREC restorations with service times in excess of 20 years still display a degree of clinical excellence, which is normally attributed to metal-based restorations.

The micromechanical bond between the ceramic inlay and the hard tooth tissue stabilises the cavity walls. In combination with the adhesive bond, the stabilising effect of the immediate CEREC restoration on the residual tooth obviously offsets the consequences of wider adhesive gaps, as evidenced in long-term clinical findings.

High-strength CEREC crowns
So far, long-term investigations have concentrated almost exclusively on CEREC crowns made of feldspar ceramic materials. At the School of Dentistry, University of Michigan, we set out to investigate the material suitability of lithium disilicate (LS2, IPS e.max CAD, Ivoclar Vivadent) for full contour, monolithic crowns. Our aim was to utilise the enhanced flexural strength of LS2 (350–400 MPa) in order to withstand the chewing forces in the premolar and molar regions.

The full crown preparation included 2.0 mm functional cusp reduction, 1.5 mm occlusal reduction in the central fissure in combination with rounded shoulders and axial reduction of 1.2 mm. Using the CEREC 5 system, 62 crowns were created for 43 patients and then placed with the aid of dual-cure luting cement. There was a small degree of sensitiv- ity reported in the first week post-operatively. This had subsided by the third week and there were no reports of sensitivity at the one- or two-year recall evaluation.

After two years of clinical service, there were no clinically identified cases of crown fracture or surface chipping. Clinical monitoring revealed a positive long-term survival prognosis. Although two years in situ is a relatively short period of time, the survival rates are on par with those obtained in similar studies of ceramic crowns (Fig. 1).

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Dr Dennis J Fasbinder, looks at CEREC

‘This new concept motivated large numbers of clinicians and prompted them to carry out their own follow-up investigations.’

Dr Dennis J. Fasbinder is Clinical Professor in the Department of Cariology, Restorative Sciences and Endodontics at the University of Michigan.

‘After two years of clinical service, there were no clinically identified cases of crown fracture or surface chipping’

Fig. 1 LS2 crowns after the two-year recall visit.