IPS e.max — Two clinical cases

Fig. 1: Pre-op situation: 13-year-old crowns on teeth 21 and 22. The root surfaces were exposed, as the gums had receded. In addition, the ceramic showed a grey colour compared to the contralateral natural teeth. — Fig. 2: Wax-up of teeth 21 and 22 in the pre-op state. Opinions according to the endodontic and prosthetic restoration of teeth 21 and 22 with composite post and core build-ups and crowns. — Fig. 3 A & B: Intracoronal teeth 21 and 22 crowns prepared and posts inserted with post and core build-ups made of composite and glass fibre posts ready to accommodate all ceramic crowns. Overview (A). Close-up of abutments 21 and 22 (B). — Fig. 4: Temporary restoration of teeth 21 and 22 with composite materials, closing situation after four weeks of treatment.

After a non-inflamed gingival situation was achieved after four weeks, the location of the preparation margins in relation to the course of the gingival margin was checked and an impression of the abutment teeth taken. The sulcus management entailed a thorough display of the preparation margins by means of the double cord technique. An electrosurgical extension of the sulcus was not required. Iron-III-sulfate was used as an astringent.

Fabrication of the restoration

The best starting point for the framework design is the fully anatomical model of the restoration, which is selectively reduced for the veneer. It is important that the veneering ceramic does not account for more than 50% of the entire restoration thickness in order to avoid a weakening of the overall restoration. The crown copings were fabricated from lithium disilicate glass-ceramic blocks (IPS e.max CAD MO) in the laboratory using the inLab system (Sirona, Fig. 5).

After fitting and finishing, the framework was fired in a ceramic furnace. The use of the stipulated temperature profile had to be achieved and the accurate shade and opacity attained. Figure 7 shows the tempered crown copings. Different firing programmes are available, depending on the ceramic furnace in use.

Before the IPS e.max Ceram materials are applied, the framework must be cleaned with steam or in an ultrasonic bath (Fig. 8). The IPS e.max CAD framework must not be blasted with aluminium oxide.

Before dentine and incisal materials are generously layered, a thin wash layer must be applied with any layering material and fired (Fig. 9). Subsequently, the restoration can be completed as usual (Figs. 10 & 11 A & B).

The restoration must not be sandblasted with aluminium oxide prior to seating. The inner aspects of the restoration were treated with IPS Ceramic Etching Gel for 20 seconds. This etching procedure is conducted both with adhesive and conventional cementation.

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The zirconium oxide bridge framework was milled from an IPS e.max ZirCAD zirconium oxide block using the inLab system. The sintered zirconium oxide was fit-te to the master model. Once the framework was finished, a suit-able shade of ZirLiner was applied and the framework was fired (Fig. 16).

A translucent pressed ceramic inlay in tooth 17 is much easier to fab-ricate by means of the press tech-nique than the layering method. A modelling wax that burns out without leaving a residue was used for the wax-up. The teeth were modelled fully anatomically. A small portion of inlay material was applied only in the buccal and lingual areas (Fig. 17).

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Figs. 23A–C: Inserted inlay/crown-retained bridge tooth 15 to 17. Final clinical pictures: occlusal view (A) and buccal view (B & C).

The basal view shows the central white-opaque zirconium oxide bridge framework, which was covered with the IPS e.max ZirPress veneerning ceramic in the occlusal area and in the area of the preparation mar-gins. IPS e.max ZirPress is suitable for the adhesive technique.

An inlay-retained bridge or a combined version, such as an inlay/crown-retained bridge, has to be adhesively seated in order to achieve the clinically required retention and strength of the con-struction. As the zirconium oxide bridge framework exhibits only a very low translucency, a chemi-cally or dual-curing adhesive and luting composite have to be used to ensure complete polymerisation. In the present case, the prepara-tions were isolated by means of electroosmotic sulcus manage-ment, iron-III-sulphate applica-tion, and the placement of retrac-tion cords (Ultrapak, Ultradent). It was not possible to use a rubber dam to establish a completely dry field; therefore, the bridge was in-setted under stringent moisture control. The retraction cords had to remain in place in the sulcus as far as possible during placement to avoid sulcus fluid from escaping and to protect the sulcus from penetration of adhesive and luting composite. In the present case, the Multilink luting composite system was used for the adhesive tech-nique. Before the bridge was seated, the restoration was condi-tioned with 5% hydrofluoric acid gel (IPS Ceramic Etching Gel) in the area of the etchable IPS e.max ZirPress ceramic, and subse-quently silanised (Monobond-S). Excess cement was removed with foam pellets, brushes, and dental floss immediately after placement before the restoration was light-cured. At the cementation joint, a brush should be preferred to a foam pellet to prevent the luting composite from being wiped out of the cement margin. Figures 25A to C show occlusal and buccal aspects of the restoration in situ: the fully veneered inlay/crown-retained bridge seamlessly blends in and the surrounding soft tissue looks vital.

Conclusion
The IPS max system currently offers ceramic materials for the fabrication of single tooth restora-tions (crowns, partial crowns, vene-ers) and 3-to-4-unit bridges using the press and CAD/CAM techniques. Dental technicians can work with only one layering ceramic on the different framework materials and thus cover virtually all indications in all ceramics. Dental technicians will appreciate the benefit of hav-ing to handle only one veneering ceramic, which will enable them to fabricate predictable restorations more efficiently.

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