Step-by-step restoration with Tizian CAD/CAM

Established in 1994, Art Dental Ltd., a fast developing dental laboratory, has more than 16 years of professional experience in all types of highly aesthetic dental restorations. New generation materials and modern layering techniques ensure the production of consistent and high quality restorations. In view of the latest trends in modern dentistry, the laboratory specialises in the production of restorations placed over implants, as well as large constructions, for example 16-unit bridges on implants with no other teeth available.

For the past two years, Art Dental has produced more than 500 constructions using ZrO₂, non-precious alloys and PMMA composite/temporary constructions in combination with the Tizian CAD/CAM system (Schütz Dental). The following cases aim to demonstrate the significant advantages of ZrO₂ in combination with Tizian CAD/CAM.

Case I (Figs. 1–15)

This 45-year-old female patient suffered from very serious periodontal problems. The treatment plan involved extraction of all maxillary teeth and subsequent placement of six implants. In order to find the ideal place for perfect osseointegration and to avoid sinus lift intervention, the
Two implants in the area of the distal premolars were fixed at a 35° angle.

Two attachments were placed on teeth #12 and 22, which enabled direct restoration. Many aspects had to be taken into consideration in order to achieve an enhanced stability, excellent shape adaptation and lifelike aesthetic results. We decided that the permanent construction was to be done using ZrO2 and Tizian CAD/CAM.

We began by loading the model and the bite scans into the modelling software, which detected the preparation line of each unit individually. Owing to the flexibility of the software, the preparation lines of the attachments and the 35° placed implants were easily detected. Additionally, the process was fast and easy with an excellent accuracy of fit. Such level of precision can be achieved manually only at a high time cost.

A unique type of insertion was performed in the next step in order to determine the best position for the construction in the blank and to avoid undercuts, so no further actions would have to be done manually. After milling and sintering, the bridge showed an excellent accuracy of fit. We reduced the thickness of the cement gap and the crown border parameters, removed undercuts and received perfect results (demonstrated by the green arrows over each crown in Figure 5).

The software proceeded by automatically loading the anatomical shapes. A large variety of software tools provided excellent, lifelike results with regard to the natural tooth structure, morphology,
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symmetry and composition. In this case, which would have been a challenge for every CAD/CAM system on the market, the Tizian Creative RT design software demonstrated significant advantages during the shape-forming process, especially for the attachments and the distal implants.

We were able to call the antagonists every time we needed to during the entire modelling process. The software automatically arranged the occlusal and approximal contacts but these can also be adapted manually if necessary. After the construction had been adapted to the bite, we proceeded to shrink the crowns and pontics. With the entire palette of forming tools available for reshaping, we reduced as much as we needed to. The connectors were set quickly and easily, while one was able to choose between different shapes, move in all directions, and change height, weight and thickness.

Figures 9 to 15 show the final construction before and after being seated in the patient’s mouth.

_Case II (Figs. 16–24)

This 40-year-old female patient was not satisfied with the look of her smile. By restoring her teeth, we were able to change the way the patient felt about her appearance. We selected a 12-unit zirconium framework with ceramic cover, a highly aesthetic solution.

_Case III (Figs. 25–27)

For this 54-year-old female patient, we created two temporary constructions from advanced PMMA composite materials for teeth #15 to 25 and #35 to 45. The two bridges, which she was required to wear for three months, were then replaced by zirconium constructions. The two bridges were placed on implants. The modelling process followed was the same as described in the previous cases.

_Co nclusion

The Tizian CAD/CAM system enables rapid manufacture of highly accurate restorations, both permanent and temporary. With user-friendly software and a large variety of software tools, as well as a fast and easy scanning, modelling and milling process, the materials are processed quickly and accurately with results hardly distinguishable from natural teeth. This exceptional piece of technical equipment proved to provide reliable and consistent results and product quality, as well as excellent bio-compatibility of the materials. Additionally, compared to cast-metal techniques, considerably less time was needed, while accuracy of fit and precision increased.