Produce therapy splints via CAD/CAM with Schütz Dental technology

Today’s new digital technologies allow us to produce even challenging dental restorations in a creative, highly precise and time-efficient manner. So, why should we work with the old methods when Schütz Dental provides us with the means to produce therapy splints with an excellent fit via CAD/CAM technology? These splints offer exceptional material characteristics and are economical to produce (Fig. 1).

The production of therapy splints using Schütz Dental products does not necessitate complex new systems and techniques. Rather, it follows the established procedures of CAD/CAM
restoration techniques. A situation model is first produced. Next, impurities such as bubbles are removed from the occlusal area. Subsequently, the model is adjusted regarding the relation between the skull and temporomandibular joint with the help of a facebow.

The upper and lower jaws are each digitised with a complete 3-D scan after a patient case has been created in the workflow file. Afterwards, both models are adjusted to each other in the scan fixator and scanned. A precise match of the models is achieved with help of this scan fixator. The fixator also helps to provide an exact adjustment to the relation between the skull and temporomandibular joint in the virtual articulator. This completes the scanning procedure.

The models are then opened in the Tizian Creativ RT CAD software (Schütz Dental). First, the insertion vector of the splint is preset. In this case (Fig. 3), it is done for the lower jaw. Here, the user presets the parameters that determine the later fit (tight or loose).

Next, the fully adjustable virtual articulator is positioned (Fig. 4). Owing to its multitude of functions, it allows for comprehensive individualisation. An exact positioning of the incisors and canines is obtained by adjusting the incisal panel in angle and inclination individually. The bite can be raised by adjusting the incisal marker.

In addition to these options, the system allows the user to apply measuring data from
a jaw movement analysis system (zebris TMJ, Schütz Dental) to the splint construction.

In the following step, the vertical length of the splint is defined using a preparation margin (Fig. 5). The minimum thickness of the splint is specified individually. It is very important, however, to create visible impressions in the occlusal areas. The dynamic occlusion (working and balance contacts, as well as protrusive movements) is ground gradually by clicking on the mouse.

Finally, any excess material in the occlusal area is removed, and the positioning of the incisors and canines is corrected if necessary. Afterwards, the workflow can be closed (Figs. 6–9).

The open STL (Surface Tessellation Language) interface enables the user to mill the generated file in-house with a five-axis milling system, for example with the Tizian Cut 5 smart (Schütz Dental). The material of choice for therapy splints is a transparent blank made of PMMA, for example a Tizian Transpa (PMMA) blank (Schütz Dental). I discourage the use of a three- or four-axis milling system because such systems cannot provide the precision necessary for the production of a therapy splint.

Another simple option for producing the splint is sending the dataset to a milling centre to have the splint milled there. The finished splint will arrive at the laboratory only two working days after sending the STL dataset to the milling centre.

The remarkably high precision of the splint becomes obvious when first placing it on the situation model (Fig. 10)—no matter whether it was milled in-house or industrially, or whether it was printed. Nonetheless, all occlusal contacts and movements (laterotrusion, protrusion) must be checked with an articulator and corrected if necessary.

Finally, the CAD/CAM-produced therapy splint is finished conventionally with polishing paste and a linen buff (Fig. 11).