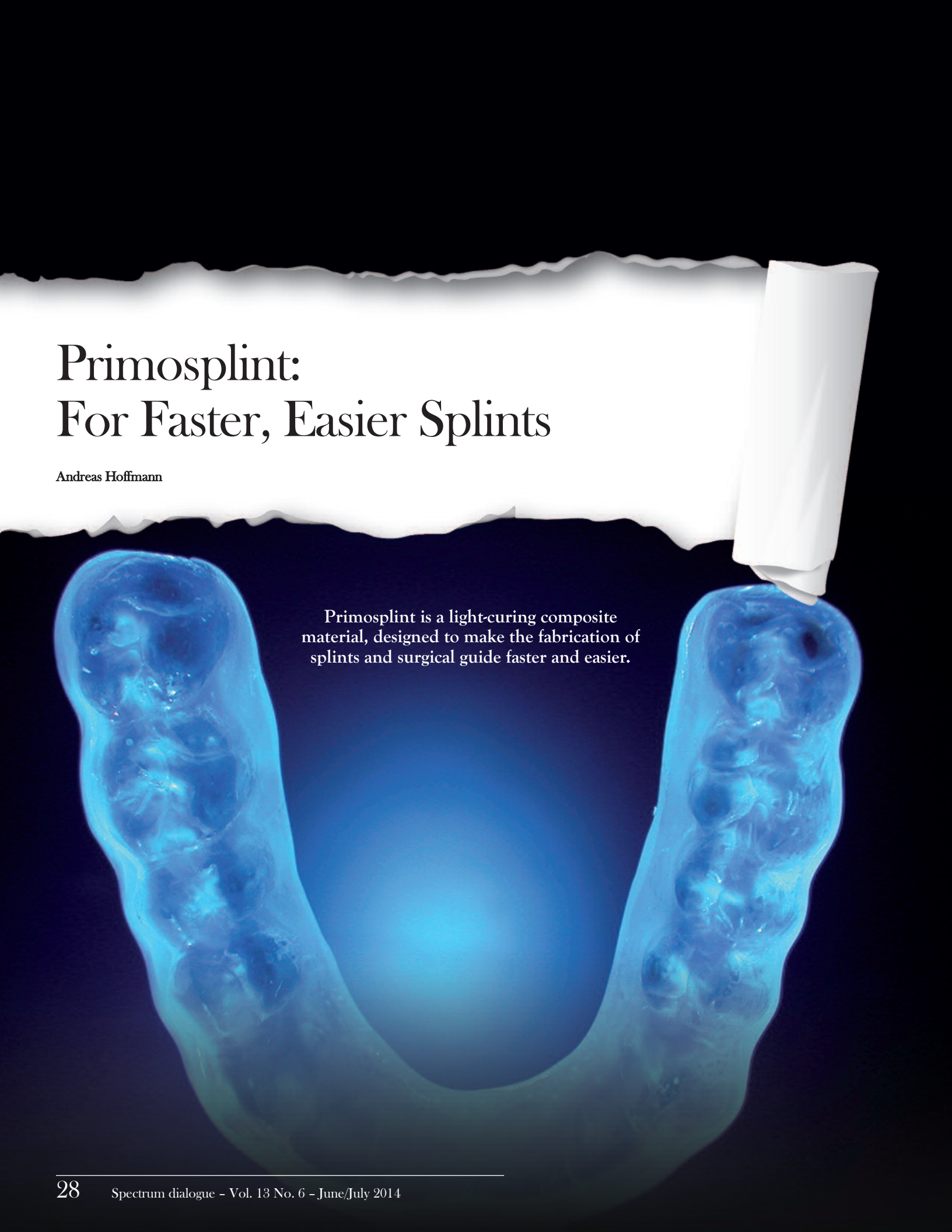
Primosplint: For Faster, Easier Splints

Andreas Hoffmann



Primosplint is a light-curing composite material, designed to make the fabrication of splints and surgical guide faster and easier.

Fit, Strength, and Stability

Primosplint offers good dimensional stability, giving a precise, stable, passive fit after light-curing and reducing the time needed for occlusal adjustments, as there is virtually no shrinkage, meaning the paths of disclusion and all required contact points can be constructed exactly and are conserved after light curing. Model duplication is also unnecessary, on the condition that undercuts are correctly blocked-out, offering considerable savings on time.

"The material offers extended working time."

Presentation

The material is sold as rods with a sufficient diameter for all kinds of splints. It has a Play-Doh like consistency, and is initially slightly hard; a supple consistency is obtained when the material is flexed, making it easily malleable. Once softened, the material also offers a comfortable working time. After light curing, a smooth, matt pre-finish can be obtained by eliminating the oxygen inhibition layer. The use of adapted bonding, separator, cleaning, and glazing agents is strongly recommended.

"The time needed for occlusal adjustments is reduced, as there is virtually no clinical or relevant shrinkage."

Indications

Essentially developed for TMJ splints, Primosplint minimizes occlusal abrasion. It has a high-tensile strength and the required modulus of elasticity (E-Modulus) associated to its accurate fitting. It is indicated for a wide range of custom appliances, and is notably suitable for the fabrication of scanning stents and implant drill guides (see box).

Biocompatible

The material contains no peroxide or methyl methacrylate for optimal biocompatibility.It does not leave a bad taste in the patient's mouth. "It is suitable for the fabrication of scanning stents and implant drill guides."

Fabricating a custom splint using Primosplint composite material

After blocking-out any undercuts, apply a recommended separator fluid to the upper and

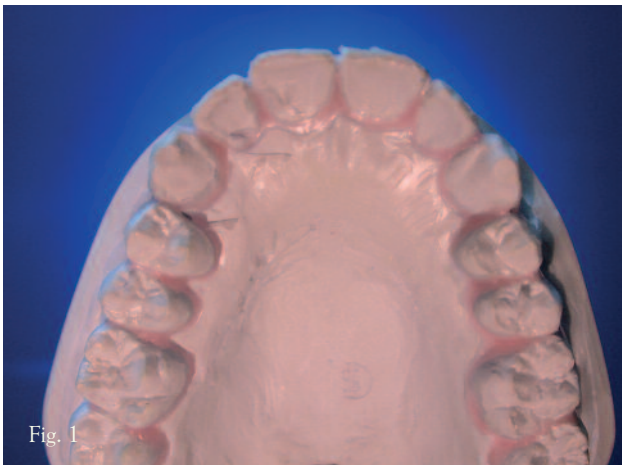


Fig. 1

Fig. 2

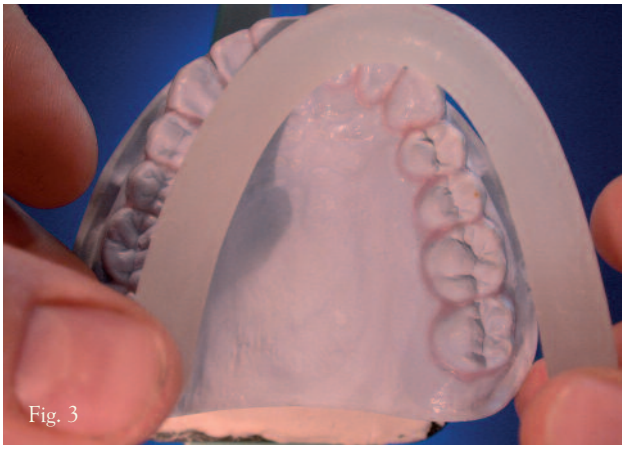


Fig. 3


Fig. 4

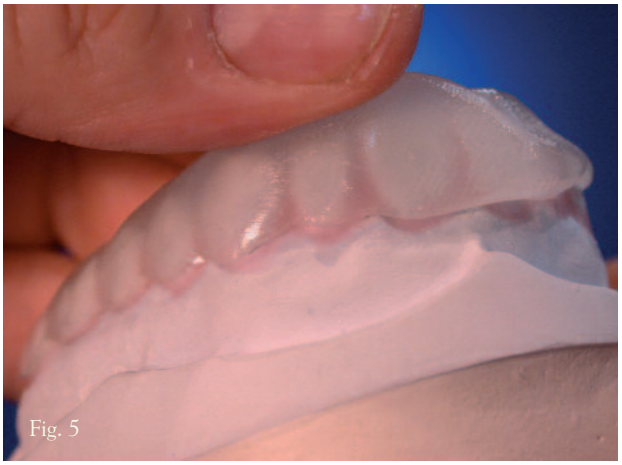


Fig. 5


Fig. 6


Fig. 7

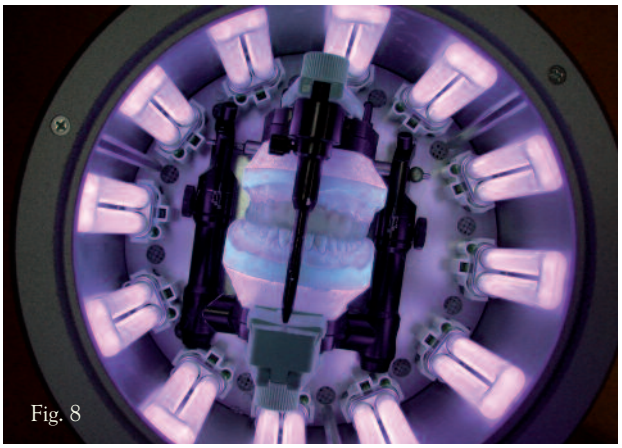


Fig. 8


Fig. 9

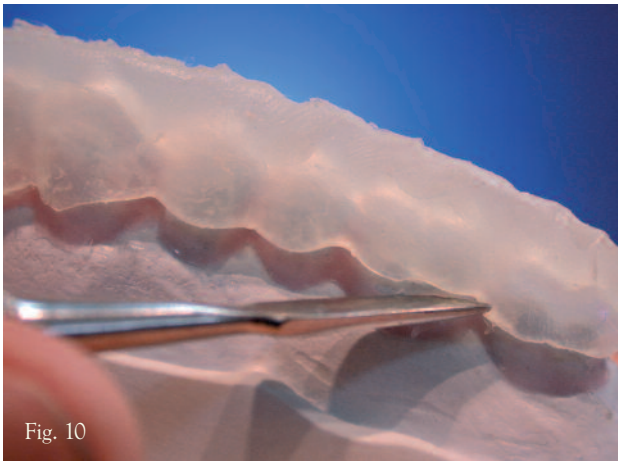


Fig. 10

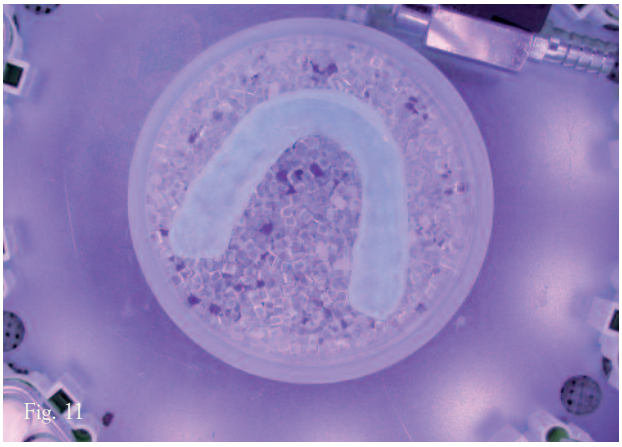


Fig. 11

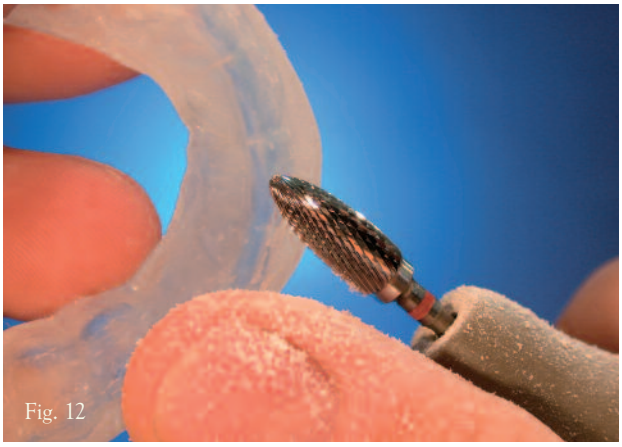


Fig. 12

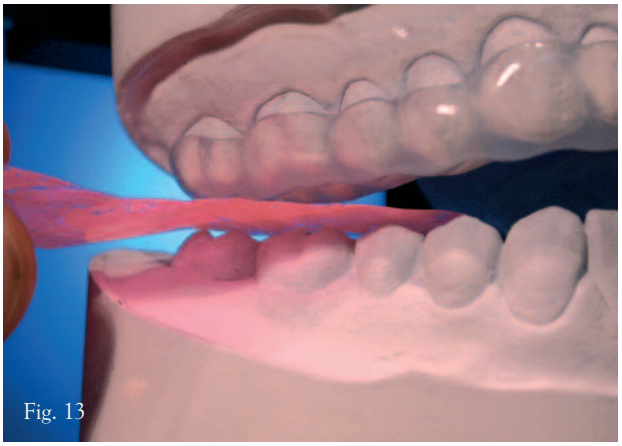


Fig. 13

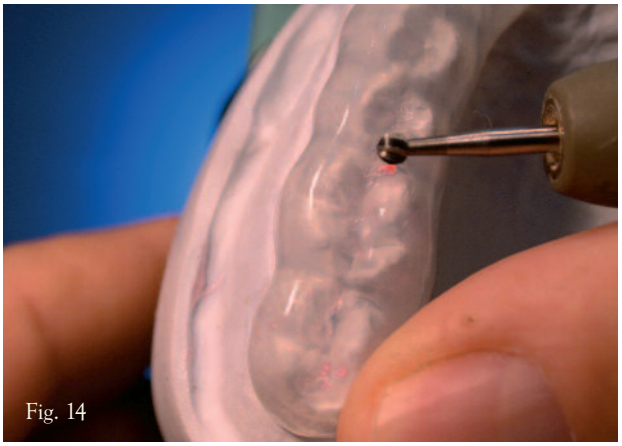


Fig. 14


Fig. 15


Fig. 16

lower models and leave to dry (Fig. 1). Applying a small amount of separator to the hands stops the material from sticking (Fig. 2).

Flex a Primosplint rod to render it malleable (Fig. 3). Pre-form into a dental arch shape, then lightly press this arch onto the model, coat with a thin layer of separator and model it in a gingival direction, both labially and lingually (Figs. 4 to 6). NB: Ensure that a sufficient amount of the Primosplint material remains occlusally, depending on the desired thickness of the splint.

Slowly close the articulator by gently tapping until the pin touches the incisal plate (Fig.7). Simulate disclusion movements; the occlusal relief recorded on the splint will remain, meaning less adjustments later. Light cure for 10 minutes in a light-curing unit equipped with 350-to-400-nm UV-A bulbs - I use a Metalight curing unit (Fig. 8). After light-curing, remove the oxygen inhibition layer on the surface with tissue and suitable cleaning agent (Fig. 9). Remove the splint from the model using a stiff, blunt instrument (Fig. 10). NB: Depending on the thickness of the splint and the light-curing unit used, the underside of the splint may need to be light-cured for a further 5 minutes, especially if the plaster is dark (Fig. 11). Carry out any necessary

Fig. 17

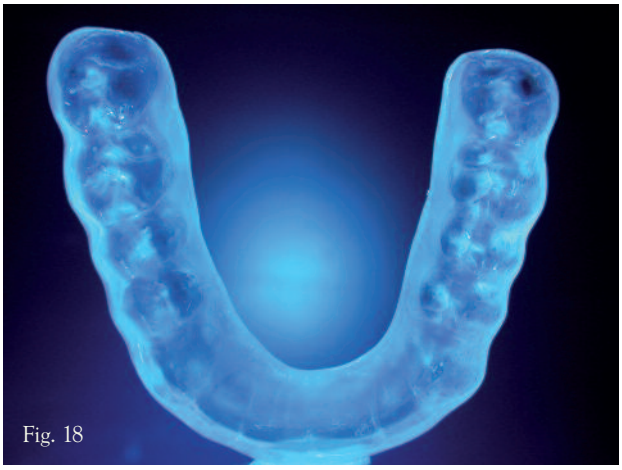


Fig. 18


Fig. 19

grinding on the splint (Fig. 12). Check the centric and ex-centric relation and, if needed, remove any undesired contact with a small round carbide bur (Figs. 13 and 14).

To polish, use a pumice followed by a high shine (Figs.15 and 16), or apply a thin layer of the light-curable lacquer glaze with a brush and light-cure for a further 5 minutes (Figs. 17 and 18). The completed splint on the model can be seen in Fig. 19.

Other Applications


Fig. A

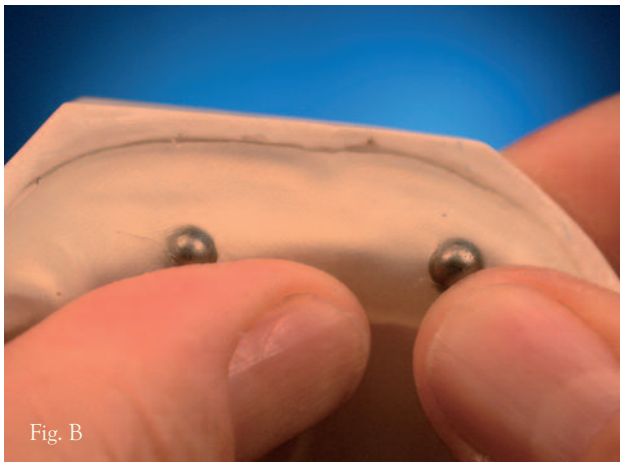


Fig. B


Fig. C

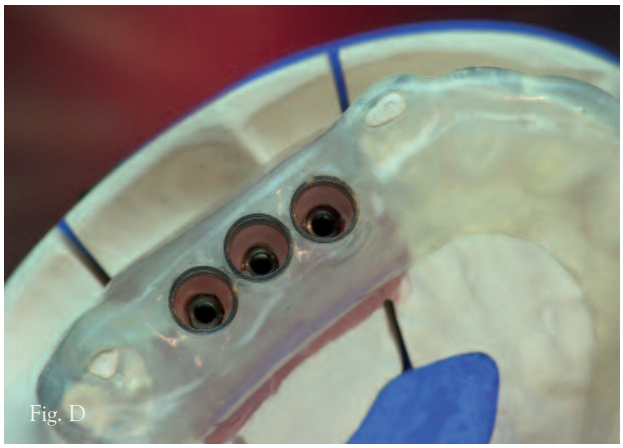


Fig. D

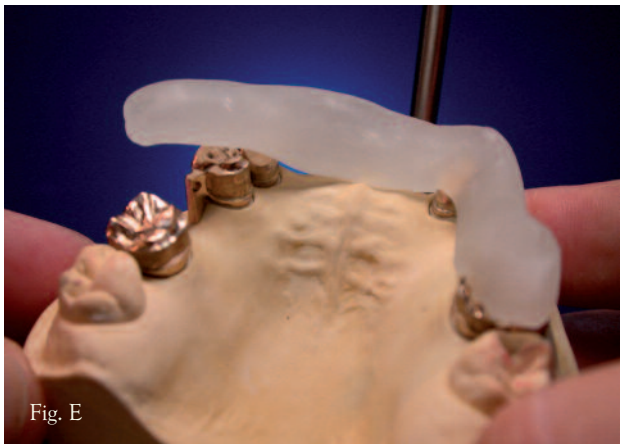


Fig. E


Fig. F

Fig. A: Edentulous jaw; implants have been indicated. A surgical scanning stent must be fabricated.

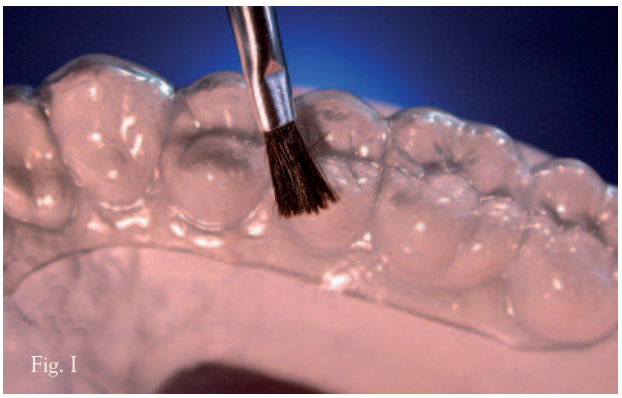
Fig. B: Determine the positions and work-in the metal balls for the scanning stent.

Fig. C: After light-curing and polishing the stent is completed with markers for exact implant placement or thickness measurement of the gingiva above the bone.

Fig. D: Primosplint can also be used for surgical drill guides. This is a Nobel Guide surgical splint (model based planning).

Fig. E: Adapt the Primosplint rod over the crowns.

Fig. F: The Primosplint "key" with the crowns fixed in the exact position after light-curing.



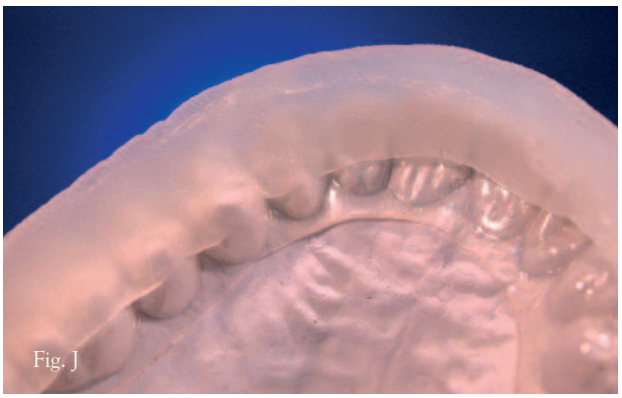


Fig. G: The key on the model without any gaps after grinding and polishing.

Fig. H: Roughen the matrix by sandblasting with 110-micron aluminium oxide (blasting pressure 2-4 bar).

Fig. I: Clean the matrix, apply the bonder with a brush, then light-cure.

Fig. J: Adapt the Primosplint rod onto the matrix and follow the procedure outlined previously from figure 4.

Surgical Guides and Scanning Stents

Due to its high stability and precise fitting, Primosplint is particularly suitable for use in implant planning, such as surgical drill guides or scanning stents where a precise fit is an important condition for detecting the dimension of the soft tissue above the bone.

Position Key for Try-ins

Providing they are well-preserved, scraps of the material can be used to fabricate a position key, which records the exact position of crowns on the model before sending to the dentist for a try-in. Using this key the dentist can easily determine if the positions of the crowns are identical on the model and in the mouth.

Suck-down Matrix

Primosplint also can be added onto a suck-down matrix (for soft/hard splints). The material is more flexible than traditional acrylics, offering greater comfort for the patient.

About the author

Andreas Hoffmann was born in 1956 and obtained his German Master Dental Technician degree in 1985. In 2000, he started his laboratory 1. DSZ. At the same time he was appointed director of the "Akademie Umfassende Zahntechnik", a highly respected post- graduate education program by one of the major German laboratory associations (VUZ) where he is also member of the board of directors. He received the Straumann prize in 1998 and is known in Germany and Europe for his outstanding publications, lectures and courses on Metacon (light curing wax), phaser and laser welding techniques, Cercon, Versyo.com, Cerec, Procera, and Galvano. Andreas is married, has two children and lives in Bilshausen, Germany.