Implant Cases Made Easy

Christina Ketzinger and Andreas Hoffmann

Christina Ketzinger and Andreas Hoffmann show a simple, yet very effective transfer and cementing key made of light cured acrylic. It is easy to produce and provides great safety for both dentist and patient.

New technologies often require new or at least altered procedures and processes to get them working. Only with these modified procedures the advantages of new prosthetic solutions can be established successfully in the daily practice. What that means in detail, shall be explained on the following case, which was solved with individually milled Procera Titanium abutments and a zirconium bridge veneered with Nobel Rondo porcelain.

It is quite an achievement in implant prosthetics today, that technicians have the freedom to create individual implant abutments in order to provide an optimal base for whatever kind of implant superstructure. Compared to standard factory implant abutments, this can be considered a milestone.

So in the actual case described, two abutments had been waxed up, scanned and sent to Procera (Nobel Biocare) by data transfer over the Internet. Some days later the custom machine milled Titanium abutments were available. Even though these abutments are rotation protected, it still has to be made sure that they are screwed on the implant in the correct of the three possible positions. It is sure helpful to code the abutments (Fig.1=8647c), especially when a larger number of abutments is needed for the case. However, when such a coding is used, both technician and dentist should agree that the markings are always facing towards labial/buccal.

Still at the time of the final insertion of the abutments in the patients mouth fitting problems may occur, which can be avoided with an easy to make and simple transfer key.

For producing these transfer keys we use, and it hasd been for quite some time, primosplint, the light cured bite splint material from Primotec (Fig. 2 = 1809). This composite, even though developed for bite splints, works perfectly for transfer and cementing keys as well. It is MMA and peroxide-free and does not have any clinically relevant shrinkage. Consequently primosplint is very well fitting and due to its modelling clay like consistency very easy and fast to work with (Fig. 3 = 8646b).

To start the practical work, first the screw channels of the individual abutments need to be closed or spacer tubes have to be inserted. Then

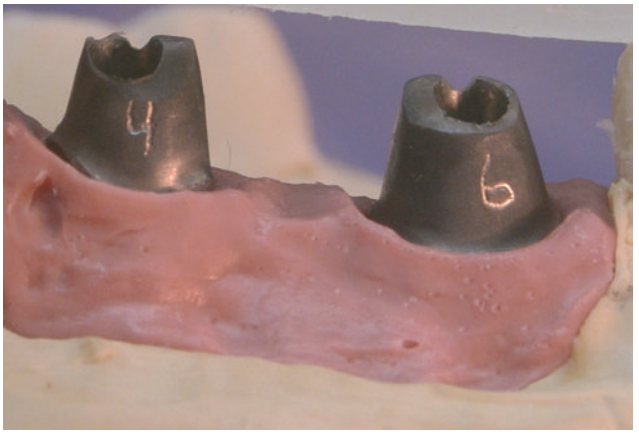

Fig. 1: Individually waxed-up, machine milled Procera Titan-Abutments.

Fig. 2: The primosplint Kit and its system components.

Fig. 3: Primosplint comes in rod shape and has a kneading clay like consistency.

Fig. 4: The material is thixotrop, by absorbing energy it becomes soft and gentle.

primosplint is modelled over the implant abutments, in a way that also the adjacent teeth are occlusally covered (Fig. 4 = 8647org).

After ten minutes in the UVA light curing unit, the transfer key is polymerised and can be finished using carbide burs and/or sandpaper on mandrel (Fig. 5 = 8657d). Polishing, either mechanically or by using primoglaze glazing lacquer is possible but practically not necessary.

This primosplint transfer key helps the dentist to safely insert the individual abutments in the perfect position and /or to detect any fitting problems or discrepancies before the prosthetic work is continued. Another control option comes up once the abutment impression has been taken and the new master model was made. Also on the newly made model the primosplint transfer key has to fit perfectly, otherwise a mistake must have occurred either during impression taking or model making.

If all has gone well up to this point, the model will now be scanned, the Procera understructure designed on the computer and the data transferred to the milling center. After the milling process, the zirconium dioxide understructure is sent back to the lab and, in this case, veneered with Nobel Rondo porcelain. Then the case is finished as far as the laboratory is concerned.

However, it needs to be made sure that the bridge will also be cemented in the perfect position and with even pressure. To help the dentist to ensure that everything works perfectly in the final stage of cementing, we deliver the bridge with a cementing key – again made of primosplint (Fig. 6 = 8701h). This key is easily made by modelling the composite material over the complete quadrant. Since primosplint is thixotrop, which means that it becomes softer and gentler when absorbing energy; the material should be moved in the hands and slightly kneaded before it is pushed with gentle and pulsed manual pressure over the Procera bridge and the adjacent teeth (Fig. 7 = 8706i). Once all occlusal surfaces are fully covered, the articulator will be opened about 2 mm on the incisal pin. Then the articulator will be closed with gentle pulsed

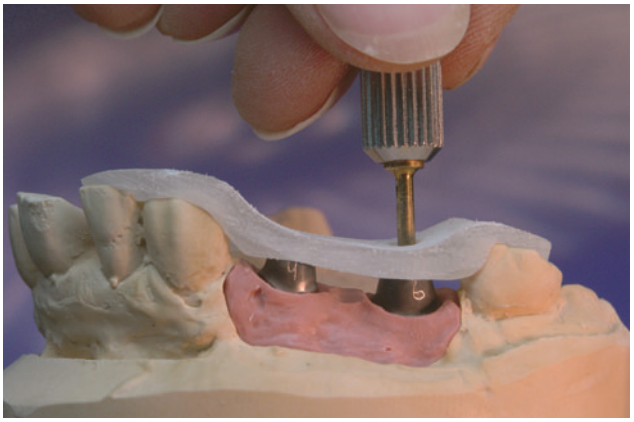

Fig. 5: The finished transfer key. Can be but does not have to be polished.

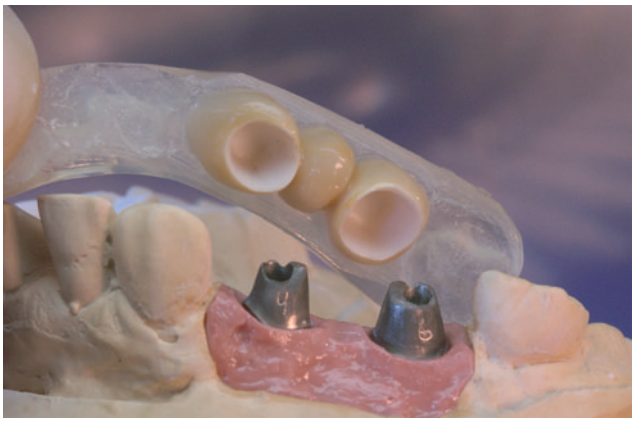

Fig. 6: The cementing key providing perfect positioning and even occlusal pressure while incorporating the bridge.

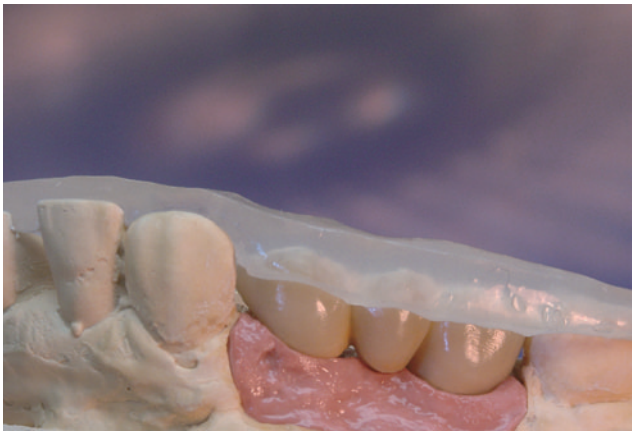

Fig. 7: Primosplint is applied occlusally over the bridge and the adjacent teeth.

Fig. 8: The articulator is opened on the incisal pin …

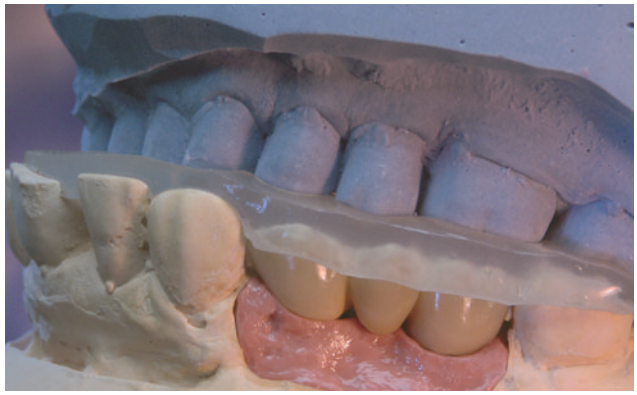

Fig. 9: … then
closed with a pulsed (tap-tap-tap) movement.

Fig. 10: The Metalight light curing units – ranging from the small bench top Mini to the large space Classic central unit that even hosts a fully adjustable articulator.

(tap-tap-tap) pressure (pics. 08 and 09 = 8691f and 8689e). When the pin is touching the incisal table the modellation is practically finished. Now the cementing key can be polymerised for 10 minutes, either in the articulator, if a sufficiently spacious light curing unit is available, or off the articulator just on the model (fig. 10 = 8609).

In general, primosplint can be polymerised in any light curing unit equipped with UVA light bulbs (350-400 nm wave length)- for example, conventional curing units used to polymerise custom impression tray materials. Strong stroboscope light curing units with high polymerisation temperatures must not be used as they negatively influence the precise fit.

After light curing, the cementing key is pretty much ready. Due to the fact that primosplint does not clinically shrink or distort during polymerisation, almost no finishing work needs to be done. Same as with the transfer key for the abutments, the cementing key does not require polishing. The result is a simple yet very effective tool, which does not leave any room for discrepancies or surprises (fig. 11 = 8698g).

No discrepancies, because the cementing key allows only one, namely the position of the bridge

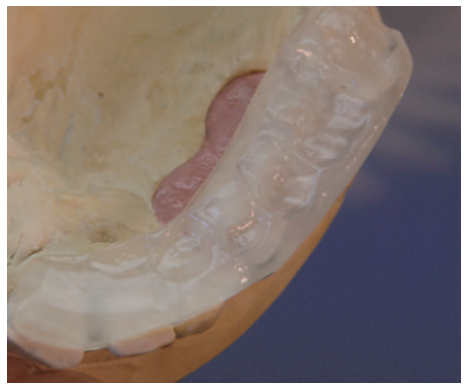

Fig. 11: The primosplint cementing key – exact positioning and even occlusal pressure are guaranteed.

on the abutments. No surprises, because the cementing key ensures that the bridge gets even occlusal pressure during the cementation procedure.

So by thinking a bit different, using the right materials and communicating well one can help to put new technologies into daily practice safely and successfully.

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About the author

Andreas Hoffmann, MDT, *born in 1956 achieved his German Master Dental Technician degree in 1985. As of then he was managing director and shareholder of a German dental laboratory group. He sold his shares and started his new laboratory 1. DSZ in the year 2000. 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 a member of the board of directors. 2004 he was appointed associate professor for joining techniques (phaser/laser) at the University of Osnabrück/Germany. Since 2006 he also teaches for the Donau-University Krems at the Master of Science Dental Technology curriculum. He received the Straumann prize in 1998 and is know in Germany and Europe for his outstanding publications, lectures and courses on Metacon (light cured wax), phaser and laser welding techniques, Procera, NobelGuide, Cerec, Cercon and Galvano. Mr. Hoffmann is married, has two children and lives with his family in Bilshausen, Germany.*