



APLICAÇÃO RÁPIDA E FÁCIL

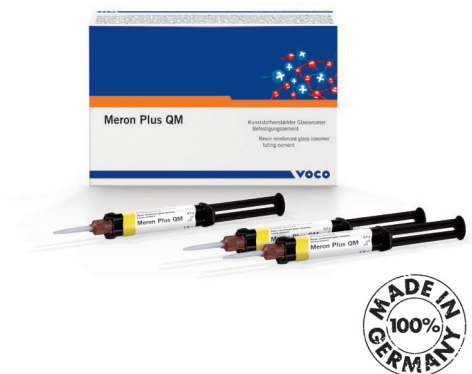
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Fonte: Prof. Dr. Jürgen Manhart, Munich / Alemanha

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per **Marcos Alexandre Fadanelli**¹⁻³

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Protocol for adhesive cementation of zirconia abutment on a titanium base

Digital Dentistry has advanced rapidly, increasing the use of customized hybrid abutments and restorations designed to be fixed to a titanium base, also known as Ti base. Titanium abutments, whose long-term longevity has been assigned to their physical properties, provide sufficient mechanical resistance to be used as a base for final restorations. Zirconia abutments may be customized to obtain a more superficial cementation line in

relation to the gingival margin, slightly going into the crevice,² which provides substantial biological support for cemented restorations.

I am often asked about the procedures to fix these zirconia parts to titanium bases. Well, in this issue, I will describe the adhesive cementation protocol that should be adopted with fixing abutments or customized restorations to a titanium base.

1. Checking the adaptation of zirconia abutments to Ti bases.

Ti-base abutments are indexed, which means that the abutment milled in zirconia will have only one

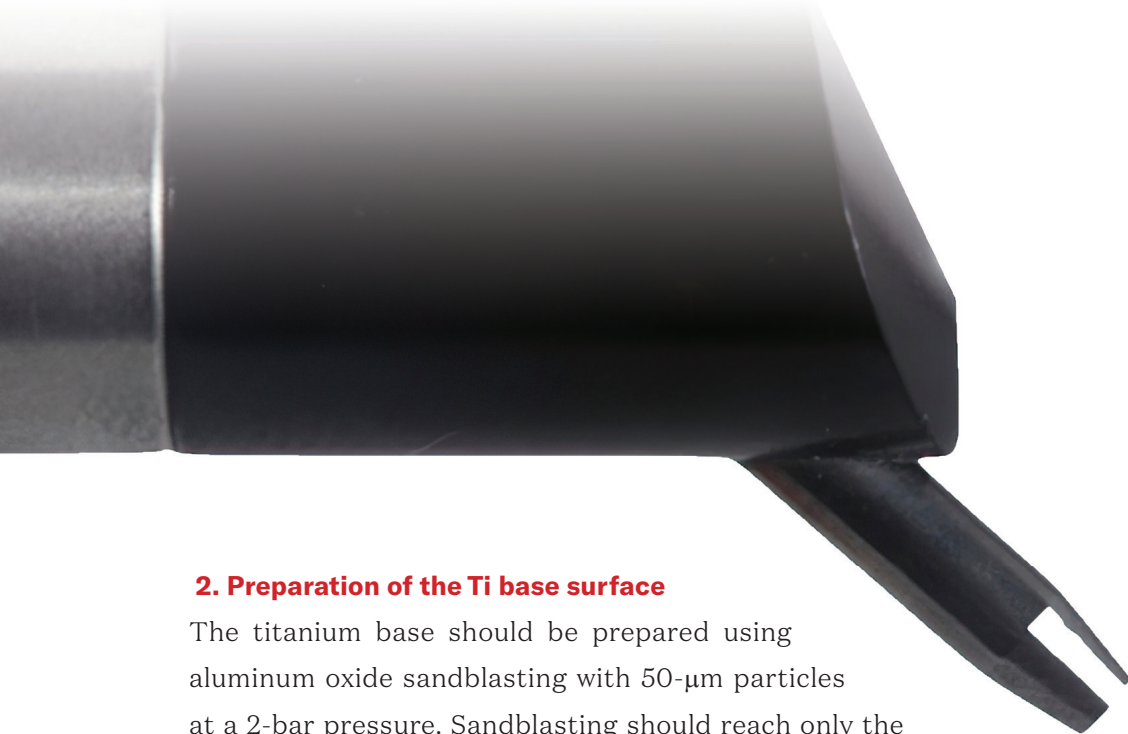
insertion axis to the titanium base. Its correct positioning should be identified, as well as its adjustment, before it is fixed (Fig 1-2).



Figure 2: Indexed Ti base allows for only one insertion axis in abutment. Note perfect adjustment of abutment to seating base of component.

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2. Preparation of the Ti base surface

The titanium base should be prepared using aluminum oxide sandblasting with 50- μm particles at a 2-bar pressure. Sandblasting should reach only the upper part of the seating part of the Ti base, and be kept for 10 seconds, at a distance of 10 mm (Fig. 3).

Figure 3: Ti base area that should be prepared with aluminum oxide sandblasting.



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3. Preparation of the zirconia surface

The internal surface of zirconia should be treated with a silica coating, which increases adhesive strength. If this step is skipped because the prosthetic laboratory has no access to the ideal material for zirconia silica coating, the internal surface should be cleaned with isopropyl alcohol before the primer is applied (Fig. 4).

Internal surface cleaning

Figure 4: Internal cleaning of zirconia component with isopropyl alcohol.





4) Application of metal and zirconia on both surfaces

A metal and zirconia primer should be applied. Such application strengthens the contact of the composite cement with the external surfaces of the Ti base and the internal surface of zirconia, thus increasing adhesive strength (Fig. 5). After primer application, the parts should be left to rest for 3 minutes.



5. Sealing the screw access tube

To avoid penetration of composite cement into the access tube for the Ti base screw, which would result in problems after cementation, a Teflon tape should be used to fill the inner space, avoiding any obstruction to access the fixation screw (Fig. 6).

6. Selection of composite cement and fixation of all components

Several factors may affect cement curing, such as zirconia's chemical composition, thickness and opacity, which may attenuate light passage and affect the material's curing characteristics³. Chemical or dual cure cements are options to cement zirconia abutments to the titanium bases because their use addresses the difficulty of light curing the cement under the zirconia abutment. The composite cement should be applied to both the external surface of the Ti base and the internal surface of zirconia to wet the surfaces to be fixed completely (Fig. 8-10). After zirconia is seated to the titanium base, excess cement should be removed using a brush, and the correct adjustment should be checked (Fig. 11).

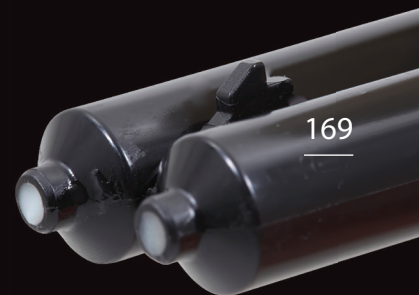
Figure 6: Sealing of tube to access screw using Teflon tape.

*Fixation screw
protection*



Surfaces prepared for bonding

Figure 7: Dual cure cement chosen for component fixation.



Composite cement, chemical or dual

Figure 8: Components prepared for cementation. They should be in correct axis of adjustment, according to index.



Composite cement should be applied to both surfaces

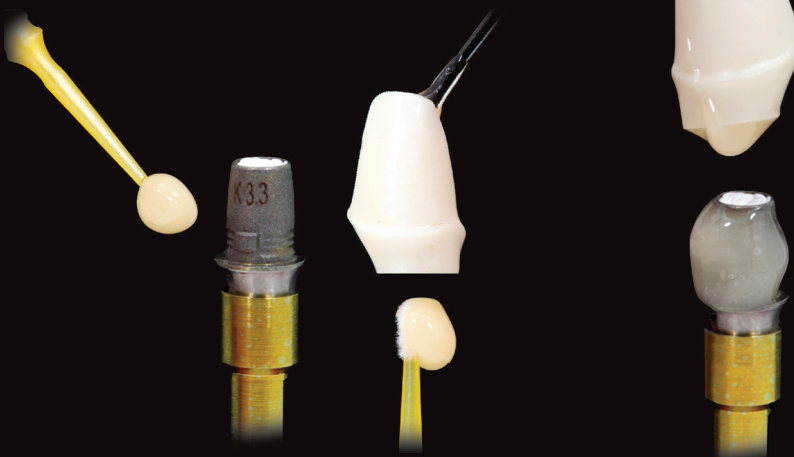


Figure 9 and 10: Moment when adhesive cement is taken to external titanium surface and internal zirconia surface.

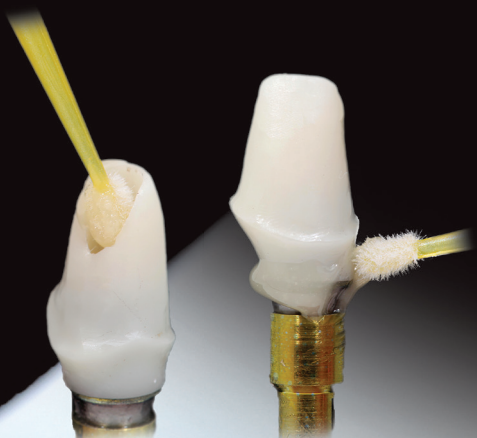


Figure 11: Removal of cement excess using a brush on both external and internal parts of whole set.

7) Additional light curing

If a dual cure composite cement is chosen, additional light curing is necessary. In case the choice is for a chemical cure cement, this step should be skipped. Light curing should be performed on all zirconia surfaces for at least 20 min on each surface (Fig. 12). After fixation, the Teflon tape may be removed, and the whole set should be left to rest for 24 hours (Fig. 13).

Light curing of the cement is dual

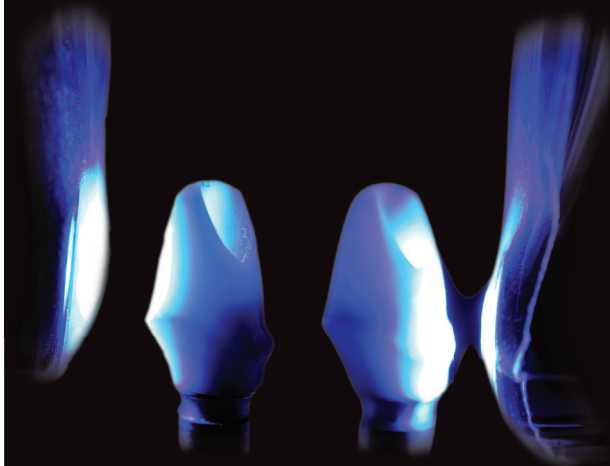


Figure 12: Light curing of all surfaces with dual cure composite cement in whole set.

Removal of tape that protected screw

Figure 13: Removal of Teflon tape that protected screw.

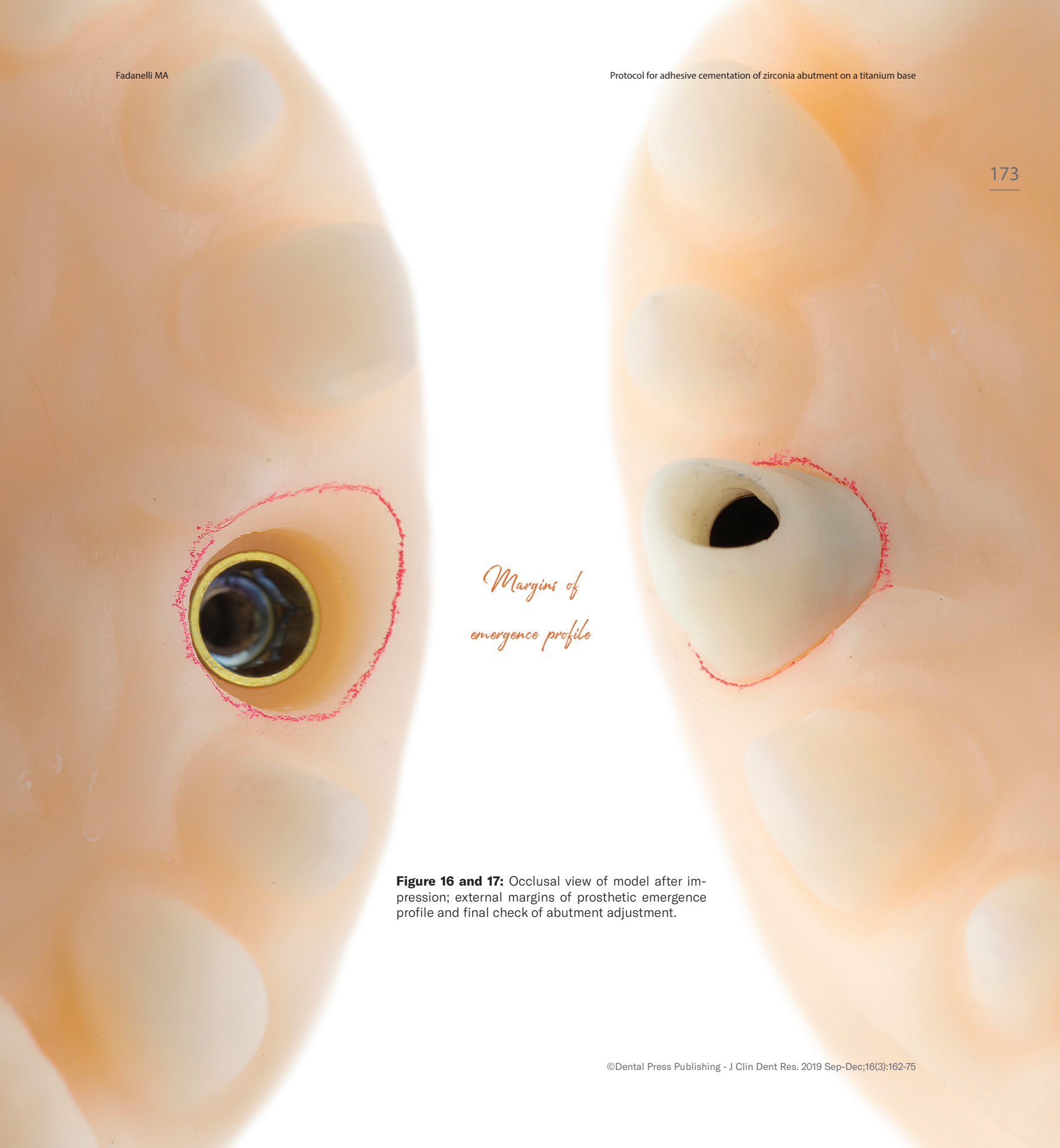


8) Post-cementation polishing

Twenty-four hours after cementation, the area of transition from zirconia to Ti base should be polished to remove any cement film that may remain in contact with the external surface of the whole set (Fig. 14-17).



Figure 14 and 15: Post-cementation polishing and final appearance of set after fixation.



*Margins of
emergence profile*

Figure 16 and 17: Occlusal view of model after impression; external margins of prosthetic emergence profile and final check of abutment adjustment.

9) Set disinfection

Finally, the whole set should be submitted to optimal disinfection or autoclaving for 15 min at 121° C (Fig. 18).

After that, the customized abutment may be placed in the patient's mouth. You may then be sure that the whole process was adequately performed (Fig. 19-20). If you had questions about this procedure, I hope I have been able to answer them.

See you next time!



REFERENCES

1. Andersson B, Odman P, Lindvall AM, Branemark P-I. Cemented single crowns on osseointegrated implants after 5 years: results from a prospective study on CeraOne. *Int J Prosthodont.* 1998;11:212-8.
2. Higginbottom F, Belser U, Jones J, Keith S. Prosthetic management of implants in the esthetic zone. *Int J Oral Maxillofac Implants.* 2004; 19(suppl):62-72.
3. Valentino TA, Borges GA, Borges LH, Vishal J, Martins LRM, Correr-Sobrinho L. Dual resin cement Knoop hardness after different activation modes through dental ceramics. *Braz Dent J.* 2010;21:104-110.
4. Zorzin J, Belli R, Wagner A, Petschelt A, Lohbauer U. Self-adhesive resin cements: adhesive performance to indirect restorative ceramics. *J Adhes Dent.* 2014;16:541-546.

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