

Milling technique: Dentures without clasps

Part 4: Channel-shoulder attachments

By Frieder Galura



“Channel-shoulder attachments... are suitable for disadvantageous pathes of insertion, where telescopic crowns come to their limit and cannot be used successfully..”

Channel-shoulder attachments belong to the group known as classical attachments within dental laboratory milling techniques. They are mainly used in the area on and around canines and premolars. These attachments are suitable for disadvantageous pathes of insertion, where telescopic crowns come to their limit and cannot be used successfully. Therefore the channel shoulder attachment is a good attachment to become familiar with.

The attachment parts are:

1. The occlusal shoulder: This ensures a vertical support and reinforces the attachment against horizontal forces.
2. The attachment itself: Incorporates the largest friction surface.
3. The channel: a half-drilling in the proximal area prevents deformation of the attachment through transversal forces.
4. The interlock: is a drilling in the proximal area or result through the contact of two half channels.
5. The cervical shoulder: This ensures a vertical support can be left out in the case of lingually inclined teeth.

The disadvantage of this attachment is the visible metal portion in the occlusal area of veneered crowns. As a modification the attachment can be milled without occlusal shoulder in connection with an extra-coronal attachment. Generally it is recommended to make a full wax-up for a perfect integration of the shoulder-attachment into the tooth shape. The procedure is explained in Figure 1-20.

This series will continue in the next edition with Part 5: Plastic attachments.



Figure 1. Wax-up with milling-wax StarWax M (Dentaurum).



Figure 2. Aligning the depth of the interlock.

About the author

Frieder Galura was trained as a dental technician at the University Dental Hospital in Heidelberg, Germany. He has worked in many dental practices and laboratories in Germany, concentrating on ceramics, milling work and attachment techniques. He commenced working for Dentaurum as dental technician in the prosthetic department in 2002 and has lectured and run training programmes for them both in Germany and throughout the world. Since 1995, he has been published in dental technical magazines in Germany, France, Spain, Italy and Japan.



Figure 3. Occlusal alignment of the interlock.



Figure 4. Control of the wall thickness.



Figure 5. Wax-milling of the shoulder for the interlock with a shoulder cutter.



Figure 6. Drilling the interlock with a twist drill.



Figure 7. Opening the interlock with a scalpel.



Figure 8. Milling the shoulder attachment and the cervical step.



Figure 9. Scraping the occlusal shoulder with a modelling instrument.

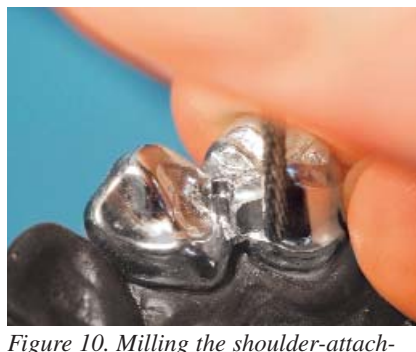


Figure 10. Milling the shoulder-attachment and the cervical step after casting with remanium(c) star (Dentaurum).



Figure 11. Milling the interlock-shoulder with a shoulder cutter.

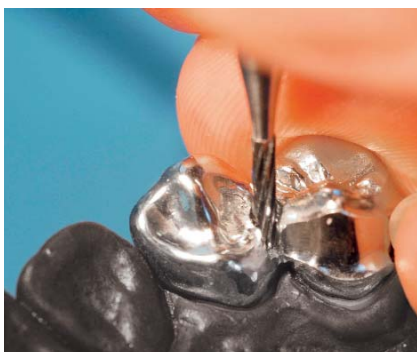


Figure 12. Milling the interlock with a channel bur (1.5mm).



Figure 13. Opening the interlock with a channel bur (1.0mm).

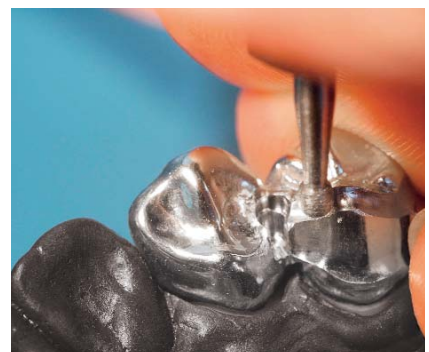


Figure 14. Processing the occlusal shoulder with a diamond bur.



Figure 15. Modelling the channel shoulder attachment with “sandwich-technique”, applying cervical-wax StarWax C (Dentaurum).



Figure 16. Applying resin for reinforcement with a brush.



Figure 17. Applying StarWax CB grey (Dentaurum).

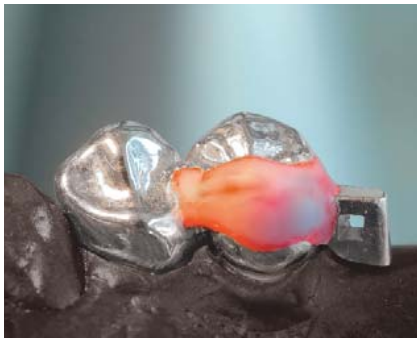


Figure 18. The finished wax-up of the shoulder attachment.



Figures 19 and 20. The channel shoulder attachment after casting in connection with a lock fit of the channel shoulder attachment.

