

IMPLANT-SUPPORTED REMOVABLE TELESCOPIC DENTURE



WOLFGANG BRUGGER

CAD/CAM or handmade? I prefer to call it CAC – Computer Aided Craftsmanship

Since the end of the 20th century, we are confronted with several modern solutions to get our daily work done. CAD/CAM started more than 20 years ago. Everyone thought it will never replace the artwork of handmade crowns, inlays, dentures, partials...etc. But as every one of us knows, time didn't stop, and CAD/CAM fled the market. A lot of dental technicians were afraid of it. Me too! But should we? I stepped into the business at

the age of 15, it was the year 1997 and I just finished the 9th grade. I decided to look for a job and started my 4 years of study as a dental technician, at my great cousin's dental laboratory in St.Johann, Tyrol, Austria. After my examination in 2001, I was stuck in daily business without any perspectives for my dental future. Every day just normal cases. Nothing special, nothing really challenging... but knowing that the industrial

players were aggressively taking their part on the market. In 2004, I was competing as a professional dancer and took part at the German Open Championships in Stuttgart, one of the biggest dancing competitions in the world... where I would meet my new Russian dance partner. It would not only change my career as a competitive dancer, but it also became MY biggest chance as a dental technician and it changed my life completely! So, dancing brought me to Stuttgart (Germany), but Stuttgart brought me to greater dental techniques! In the first few months, I was part of the team of Vincent Fehmer's father (Vincent is a very known young dental technician and lecturer in Europe) where I've learned everything about telescopic dentures -also known as "German Cowns". He was the one who sent me to Jörg Stuck, one of Europe's best

denture technicians, to learn everything about full dentures. It was a very intense time in this lab. But after a while, I got the amazing chance to learn everything about esthetic-reconstructive dentistry from one of the best german dentists, Dr. Robert Strohkendl Msc.est.-rec.dent. who runs Stuttgart's "Leading Dental Center of the World". CAD/CAM or handmade? For me, that time was really mind blowing, because I thought I already was a certified dental technician, who knows almost everything important to know. But he showed me the differences between what I knew and what the crazy guys did! OK, at this point, I really need to thank Robby, that's the way we called him because he taught and showed me so much about esthetic-reconstructive techniques like no one else ever did before! He was my biggest and most

important mentor in this business and I'm so so thankful for that. After that amazing time in Stuttgart I moved back to Austria because I changed my dance partner again, who didn't want to move from Slovakia to Germany but Austria. I went back to my old lab where I did my education, tried to integrate techniques I've learned at Fehmer, Stuck, and the LDCW, but it didn't work out because of the stucked system.

One and a half years later I recognized that I was in the wrong lab to do what I've learned to love: esthetic reconstructive dental techniques. So we split up and I went on to an old colleague for a while just to get out of my situation and moved into an integrated lab in a dental practice as a successor of an old retired technician. Should it be this way now?

Yes, because I was allowed to renew the little lab with all the machines and materials I wanted and so I was able to get back to my, let's name it "Dental way of Stuttgart" Three years later, in 2011, I enrolled at the "Austrian Academy of Dental Technology" and graduated as Master Dental Technician. In the same year, I started to plan my new house with a lab, and open my own tiny Laboratory in 2012. After that, I tried to integrate good quality dental techniques in the countryside of Austria, in the middle of the Alps, as well as changing dentist's minds to invest in higher quality rather than budget dental replacement for their patients. But now, let's get started with my lower jaw case with a sudden change of direction of the patient's idea of his dental replacement. Let's go!

The Initial Situation

4 Straumann Implants in the lower jaw.

The patient wants to get an affordable, reliable, natural-looking solution. 3-year-old bar-retained over denture with an incorrect occlusal plane on the upper jaw.

(Patient did not want to change anything at the upper denture) Bad situation to create a lower denture with incorrect parameters.



First

I started digitally. Scanning procedure as everyone knows it. I chose the right implant library and planned the lower set up with an incorrect occlusal plane to mill it for a first try-in and to check the bite situation. This was the situation after milling. As you can see, the 3rd quadrant goes up, the 4th is hanging down. So I decided it's necessary to speak to the patient to ask if he will allow me to change something on the upper denture at the end.

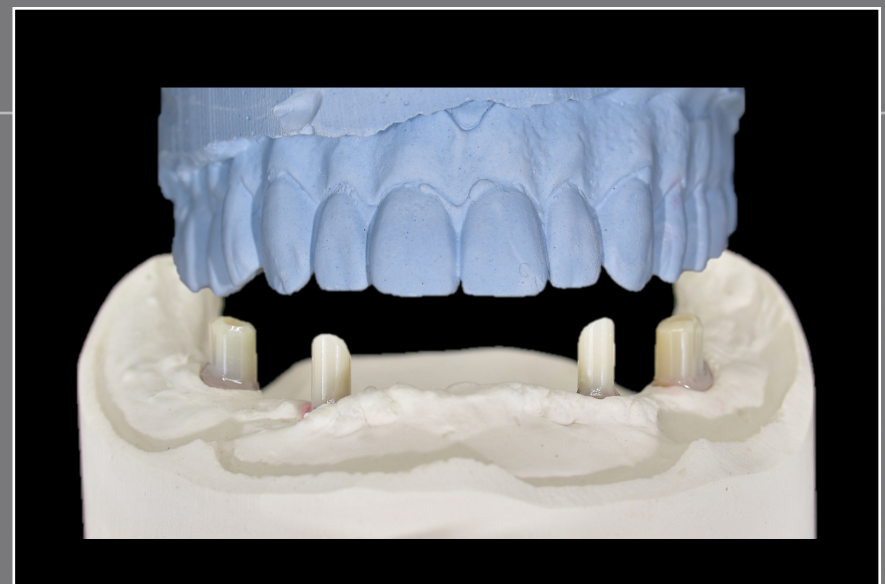


After a pleasant talk with the doctor and the patient...hooray!!!

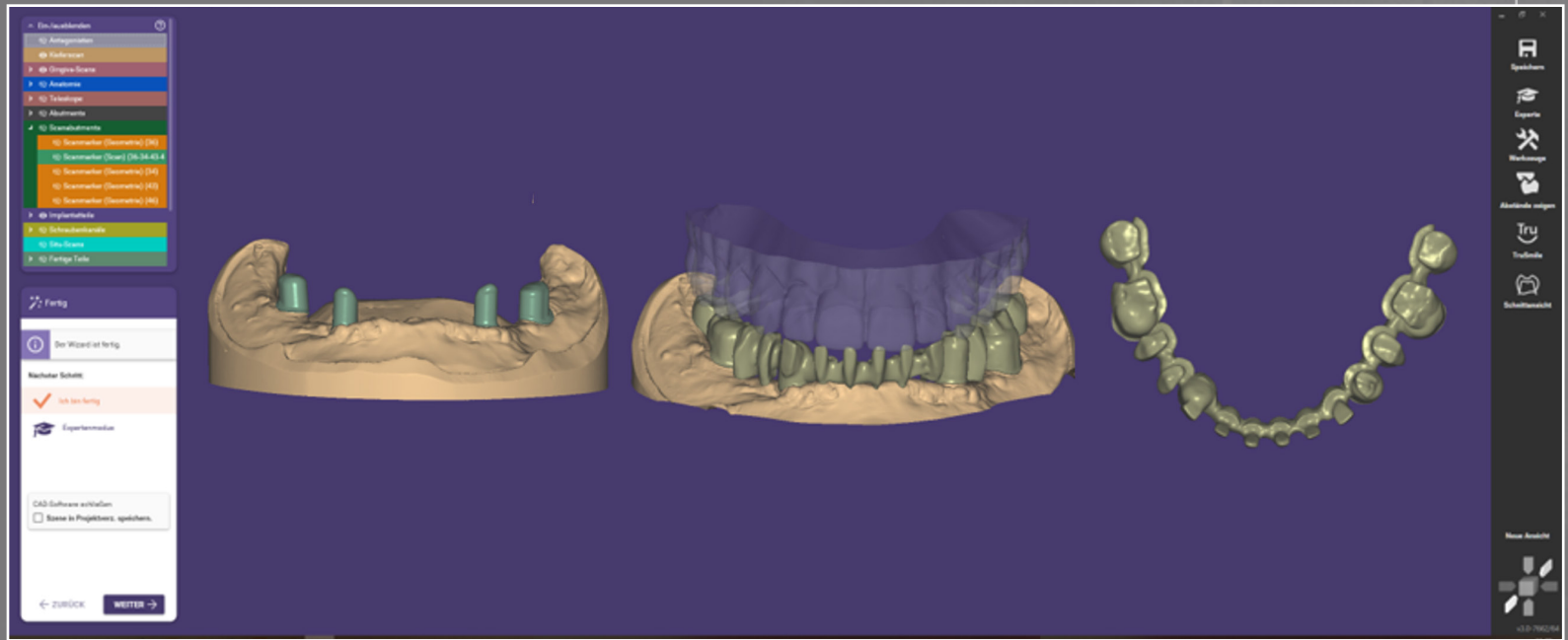
The patient changed his mind and now he is willing to change the upper denture after finishing the lower project. So back to the beginning to change the setup. I began to design my ZRO2 primary teles. Because of the previous planning and bite registration, it's much easier now to find the correct telescope position centered in the teeth. Around the occlusal screw hole, I place some retention for the over-imprint with an individual impression tray.



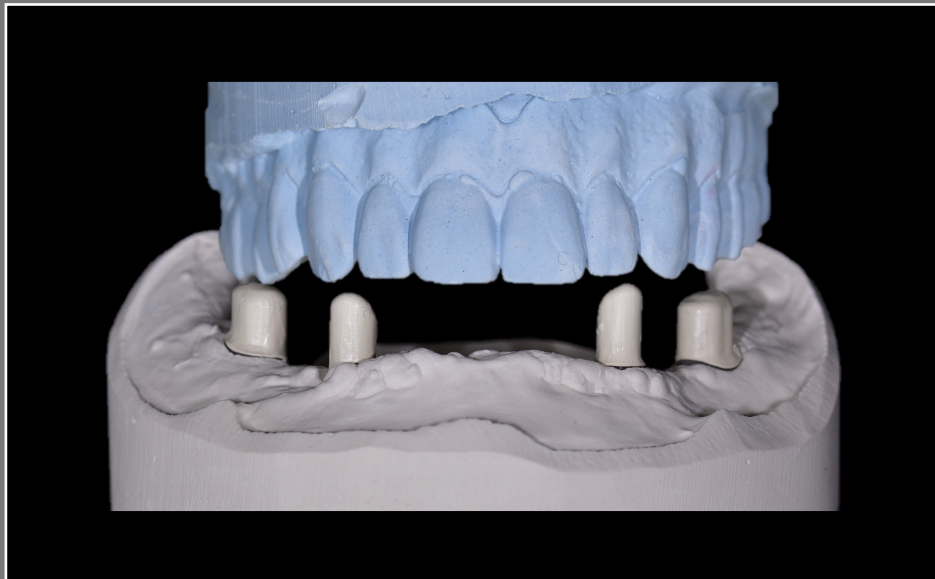
After the over-imprint with an individual impression tray, I milled the primaries with water cooling and 0° tilt. If you look very closely, you can see that I colored them with pink coloring liquid on the base before sintering. You get a little softer transition to see at the gum line when the patient takes out the dentures. Not necessary, but nice to have. I do this every time when I create individual abutments or primary telescopes. Especially occlusal skewed crowns get that natural-looking gum line! Try it, you will not regret it!



The next step was to create the secondary parts then to mill them in PEEK and create the tertiary construction for casting (I don't mill CoCr, but you can if you want to). I prefer to add extra material on the lingual or palate side for stability reasons. When I mill the PEEK parts, I let them stay in the machine when they are ready finished milling and do a try-in, in the machine!! If they are too tight I change the internal parameters of my milling strategy and mill them again in 5µm steps until they fit perfectly.



Not too tight, not too loose.
That's the most important part of
the whole work!





Time to work out the casting, check the fitting, and glue them. If anybody is wondering about my tooth library, I used the library of Gebdi Tribos 501 for the virtual setup and used the same set of teeth for the real setup over the metal frame. The really tricky thing was that I had no model of the upper denture with the correct occlusal plane. So I had to use a Kalotte to set the teeth correctly. This is only possible when you use a facebow and centric bite to find the correct position of the lower jaw!

When I finished the setup I used GC Exaclear, but not on the incisal edges and the cusps because I want them fixed in plaster to avoid a raised bite. When I work with heavy body pastes, I use this technique with an open flask from Canulor where I use a hand lamp for curing the side. I prefer heavy body pastes because of a higher percentage of ceramic particles. When I use light body pastes, I use the Anax flask to inject the composite from the occlusal.





For the last check before I opaque the metal framework and press with heavy body pastes, I use C- Silicone. It's just a little safety check to be sure that I have enough space for the composite. As you can see on the right side, I used the impressions from the setup on the pre-molars and molars. They are made of the composite when you take the Tribos 50Ic Version. I don't use them when I work with the Anax flask and have to do a cutback for enamel layering. In this case I did a cutback at the anterior teeth after pressing. That's why, you can't see incisor impressions in the silicone.





After sandblasting the metal framework I have used GC Metal primer Z to silanate the metal structure and used GC Gradia + opaque to cover the metal. For this part, I asked my girlfriend to help because it's like applying nail polish and she loves to help me out in the lab with some simple things.

The finished metal framework with 7 very thin layers of opaque. I like to spend time at this procedure because I want to have a very solid and perfectly hardened opaque to avoid chipping. Here you can see the nice PEEK secondary parts. Why PEEK? Because PEEK is soft and doesn't scrub off the surface of zirconia. And perfectly milled and polished zirconia won't wear down PEEK. PEEK is very tough and doesn't lose friction.



**For me, it's
the perfect
match!**

Ever since I've used this combination, I don't have problems with losing friction on precious metals, or jamming with non-precious metals.





After pressing I did a cutback and layered some different enamels, like ED and EP. Directly after that, I did some characterizations on the premolars and molars. The incisors got a light internal staining before layering with a thin layer of opal Light Body. The characterization and internal stainings I did with GC opti glaze color. It's quick and easy to use. Of course, you can play much more with the pastes like layering ceramics. But if you don't get paid for ornate layerings, that's the best way to get an aesthetically well-done finish.



The finished layered front teeth with some Light body opal and CLF after polishing the whole work with The OSCAR diamond polishing paste. I prefer diamond paste to polish Composite, instead of light-curing liquids like optiglaze clear or something like that, because it looks more natural in my opinion.



"Wilson" is watching you, and happy about a correct occlusal plane! The gum is finished with different colored candulor resin, some smaller bruising because of the natural gum situation of the patient, and some moderate painting. The reason for resin instead of gum-colored composite is because of the possibility of relining the base the easy way. The patient's gum situation is not very good because of smoking etc. That's why I prefer this way.



Finally, I had to renew the upper denture. Changing teeth and do some characterizations to match them with the new lower ones. A little pimping up the gum and everyone was happy about the result. I hope you enjoyed the exploration in my daily business and my way of modern craftsmanship in dental techniques.

Thank you for your attention! It was a great honor for me to get the chance for this article!



A HAPPY PATIENT



Sharing knowledge, the philosophy of the Dental Technicians Guild is the reason why I joined the DTG Affiliate Group.

As a single person, we are limited in growing. Growth is the result of many factors coming together and working together. For this reason, we do not have to hoard knowledge but to share! The future is not coming, it's already present. Machines are present and the industry wants the bigger piece of the cake.

The only way to keep our piece safe is to be better than the machines. And that's only possible when we are as one.

But we need to be careful. We don't have to fight against computers and machines because we will lose this fight when we stop loving what we do. We need to do our job with passion and use technology as our tool. When we learn to understand this, we will keep our passion and our piece of the cake. Together we have to stand. For our passion our knowledge and our future!

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