

From Start to Destination

Cristian Petri, CDT and Dr. Mircea Ghergie

Nowadays, information travels faster than our capacity to perceive it. Less than 20 years ago, the internet was taking its first steps but, today, any piece of information can be found faster, and in a larger global scale than in the media, on Google, Facebook or Twitter.

Our patients' tools to access information have improved significantly and we, as technicians and physicians, have a duty to offer our patients the right information, so that the treatment outcome is the correct one. At the same time, we must adapt to the market's demands and our

patients' financial resources while complying with technological developments.

The market in which I developed my laboratory is substantially different from the market where I honed my professional skills. Taking part in training, over the last 3 years, has allowed me to significantly improve my control over the shape, texture and coloring of the teeth, and to give my patients results that are truer to nature. However, what I had learned did not match my patient's expectations...

Why? Because, what they were looking for was to have perfectly white,

symmetrical, straight teeth without any morphological traits or transparencies.

In order to provide them a preview of what the expected end result of their treatment would be, I started offering my patients temporary PMMA provisionals with the help of CAD/CAM. These better suited their expectations by being monochromatic but, they were incompatible with my personal aesthetical demands that I was trying to convey to my patients.

Another option was making the temporaries out of composite but these are too expensive and time consuming. Since it was significantly difficult to



Fig. 1



Fig. 2



Fig. 3

explain the case or to show the possible outcome to my patients, achieving a common ground with them was never easy.

Trial and error lead us to DSD (Digital Smile Design) which we also used as a communication marketing tool. Initially, results were satisfying but we soon faced problems due to the fact that the virtual differed from the real world. It was also impossible, in some instances, to check the functionality or to even entirely replicate a DSD.

We had better results when we did a wax-up followed by a mock up. But, in most cases, the time it took to do this

was too long, and the result was, again, monochromatic. We realized that we needed a material that was fast, efficient and which gave us the possibility to imitate the natural teeth.

We also needed a material which could easily camouflage itself even on unprepared teeth. This is important because, in some situations, you want to be able to present the patient with the expected outcome for an orthodontic treatment, minimal or non-preparation veneers. without affecting the integrity of the teeth until after the patient's consent to or disapproval of the treatment plan. (Fig. 1)

Thus, we found PREMIOtemp Multilayered PMMA Blank (Primotec) for temporary CAD/CAM-made dentures. PREMIOtemp Multilayered allows us to offer the patient a preview of the final results, including all the necessary details, in a short amount of time.

Clinical Case

We will examine a case of a patient who wanted a full restoration because she was unhappy with the aesthetics of her existing dental work and its marginal adaptation. (Fig. 2)



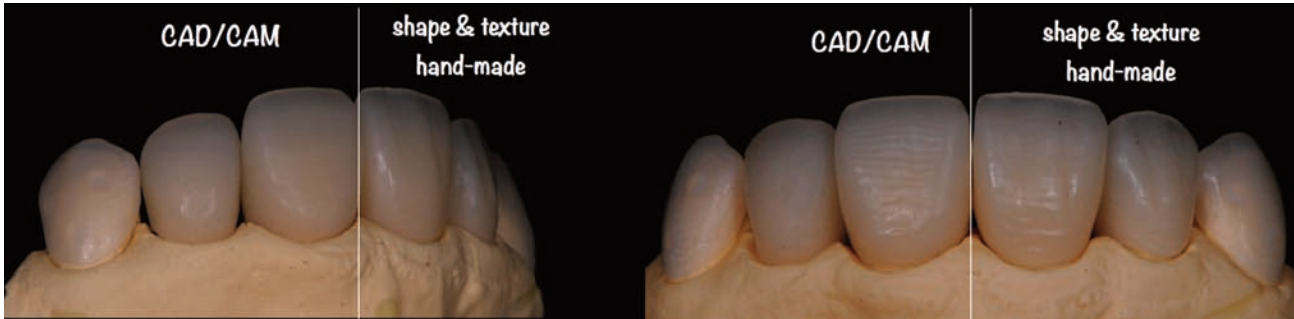
Fig. 4



Fig. 5



Fig. 6



Figs. 7



Fig. 8



Fig. 9



Fig. 10

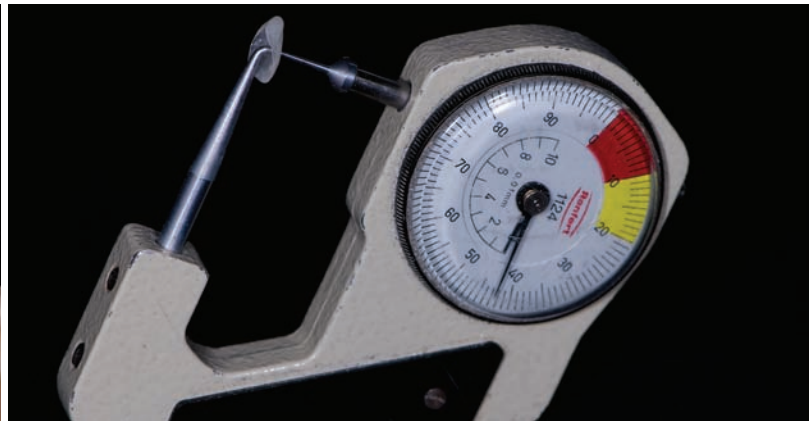


Fig. 11: Premitemp veneers

Upon closer examination, we discovered the presence of prepared teeth (ground 1.5-1.4) with metal ceramic crowns attached in the frontal region (1.2-1.1-2.1-2.2) and a metal ceramic bridge on the left lateral area (using 2.4, 2.5 and 2.7 as pillars).



Fig. 12

Clinically, a purplish discoloration of the gum was evident, due to the chronic inflammation caused by the old dental work which did not follow the gingival festoon and, additionally, due to the Ni-Cr alloy metal structure. An X-ray revealed that teeth 1.3, 1.2, 2.3, 2.7 were still vital. (Fig. 3)



Fig. 13

During the first stage of the treatment, the



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dentist took impressions in order to manufacture a temporary using the direct technique. This was mainly done to protect the prepared teeth and the gum tissue. After removing the old prosthesis, we reinforced teeth 1.5, 2.4 and 1.5 with glass-fiber posts. The crown removal, re-preparation and the fabrication of the temporary for the right lateral area, frontal area and left lateral area were done in separate

appointments. We insisted on creating wide embrasures in the frontal area, in order to make room for the papillae to descend to the contact area.

crowns in 1.2, 1.1, 2.1 and 2.2; a bridge using 2.4, 2.5, and 2.7, as pillars and veneers on 1.3 and 2.3.

The Preparation

After a shoulder preparation (jpg 4), a temporary was manufactured in the lab: attached crowns for 1.4, 1.5; single

The Impression

An impression was taken using 2 retracting chords inserted in the sulcus: first a thinner #000 diameter one (black, Ultrapack from Ultradent),



Fig. 14

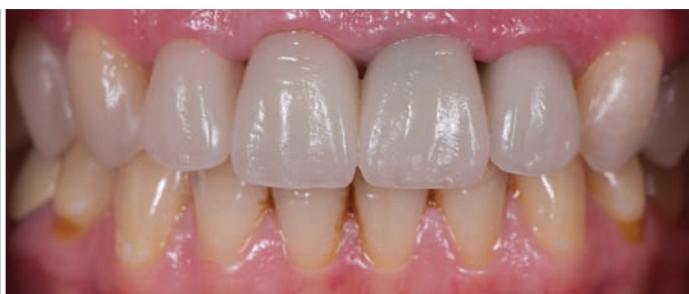


Fig. 15



Fig. 16



Fig. 17

then a second one, thicker #1 diameter chord (blue, Ultrapack), impregnated with Roeko Gingiva Liquid (Coltene)

The laboratory phase

The plaster model was poured in class 4 plaster and we used a dental Pindex (Coltene) to manufacture the master model. (Fig. 6)

We received a lot of useful information from both the doctor and patient regarding the aesthetical demands, which we were able to translate into a 3D format of the future denture.

As you probably already know, the CAD software guided by an operator, builds the insertion axis, the margins of the preparation, the cementing space and the width of the crowns in 3D (according to the settings we already have, but we can also adapt them to better conform to our case.

Having a virtual database with teeth shapes, we can choose the type of tooth

we want to adjust. After finalizing the design, we move on to CAM V4. This software is going to help us position our virtual tooth in the blank slate, and factoring in the materials and drills that will be used, it will estimate the steps and time needed for completion. Additional advantages of using CAD/CAM are that we can very quickly alter our denture in case we need a different one; we can easily re-cut another identical one and; we can use the information in the temporary denture file to create the final piece.

The multi-layered nature of PREMIOTEMP Multicolored PMMA Blank allows us to position the case in the blank in such a way that, in the end, we get transparency in the incisal third and chromatics in the cervical area. Thus, we are able to obtain a temporary denture fairly quickly and with coloration similar to natural teeth. For an even better result, the technician's touch is required. (Fig. 7: as explanation or/ and Fig. 8: Right side result after milling of the temporaries and left side result after the

touch of the technician and Figs. 9 & 10: final result after polishing the temporaries)

We adjust the contact area, the edges and the texture by means of drills and silicone disks. The occlusion pattern was an important guide: we constantly checked the functionality of the prosthesis both in the articulator, as well as in the patient's mouth. The PREMIOTemp veneers on 1.3 and 2.3 were 0.4 mm thick, as detail or/ and as explication (Fig. 11) seeming almost transparent but, when applied on the tooth 1.3, acting as a "contact lens", enhancing the tooth's natural color (Figs. 13 & 14).

By using this method, we can check if our "project" translates well into the real situation. (Figs. 12 & 15)

The temporary, except for the veneers, was cemented using Temp Bond (Kerr). The temporary veneers were cemented with Syntac-Heliobond (Ivoclar).



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Once we have finalized and agreed on all the details with the patient, we can begin work on the final restoration.

The same plaster mold and file used for the temporary was altered to obtain the copings.

For the incisors, we decided on a zirconia structure (Fig. 16) because the natural teeth had discolorations and also due to the presence of two metallic posts.

For the zirconia structures, we reduced the frontal shoulder area and the marginal seal was done using shoulder ceramics. For the layering colors, we used “deep dentin”, “dentin”, “opal effects”, “special incisal” and “enamel” (Figs. 18, 19, 20, 21).

For the veneers on the cuspids, we used IPS e.max press (Ivoclar). The core of the veneer was prepared in a wax blank and then pressed from an IPS e.max press HTA2 ingot. We layered ceramics on it in order to get a more natural look. In the end we got 0.4 mm e.max veneers (Fig. 22).

The posterior bridges had a Cr-Co support and for the bicuspids we used shoulder ceramics for better aesthetic results. (Fig. 23).

In the end, we were able to deliver the works with glaze and, to see the protocol result, we checked them in the mouth on the abutment teeth 1.2, 1.1 with the temporary crowns on 2.1, 2.2. (Figs. 24 or 24 bis were you have text as explications of what we have in the picture).

The cavity test and adhesive cementing.

The final restorations, the metal-ceramic crowns with a ceramic shoulder for 1.5, 1.4, 2.4 and the metal ceramic bridge 2.5-2.7 were cemented with the glass ionomer cement Ketac Cem (3 M ESPE).

The final veneers were first etched for 20 seconds with hydrofluoric acid 5% IPS etching gel (Ivoclar), then immersed in an ultrasonic bath, and finally, Monobond Plus(Ivoclar), a silane coupling agent was brushed on the internal surface. At the same time, the operating field was isolated, the teeth rinsed, dried and then etched for 30 seconds with 3% phosphoric acid (Total Etch Ivoclar). Syntac Primer (Ivoclar) was applied, the dental



Fig. 18



Fig. 19



Fig. 20



Fig. 21



Fig. 22



Fig. 23



Fig. 24 A & B



Fig. 25



Fig. 26



Fig. 27



Fig. 28



Fig. 29

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surface was dried and then Syntac Adhesive (Ivoclar) was applied. Next, on the internal face of the veneer Heliobond (Ivoclar) was brushed without being polymerized. The adhesive bonding of the veneers was accomplished using Variolink Veneer shade 2 (Ivoclar), the color was checked with Relyx Try-in syringes (3M). (Figs. 26, 27, 28, 29)

Conclusion

Technology is a great tool which helps us communicate, increases our efficiency and gives us accuracy but if we don't use it correctly and if we don't have competitive materials, the end result is not going to be what we desire. Of course, nothing could become reality without the skills and touch of the technician. It is said that a picture is worth a thousand words and in our case, a preview of the future denture using PREMIOtemp multilayered is a true aid for us because we can visualize our destination.

It is the general belief that it is much easier to make a temporary that is functional but aesthetically unacceptable than a final prosthesis that is easily accepted by the patient. It is also much harder to replicate a temporary that fulfills all aspects but ... I believe that this is something that actually helps and motivates us. And, ultimately, what would life be without challenges? 

About The Authors



Cristian Petri, CDT obtained his degree in Dental Technology in 1999, in Cluj-Napoca. He began his apprenticeship in Romania, and then went on to work in several labs in the USA and Germany, where he specialized in removable partial denture works, telescopic and implant prosthetics. He continued his studies at the Danube University Krems, where he attended courses held by: Prof. Rudolf Slavicek, He also took courses led by Masimiliano Trombin, CDT; Achim Ludvig, CDT; Haristos Girinis, CDT; Nondas Vlachopoulos, CDT; Uwe Gehringer, CDT; Thomas Sing, CDT.

He has owned his dental laboratory in Cluj-Napoca since 2002, and he has focused on complex rehabilitations, aesthetics and functionality since 201. He currently offers specialized training seminars and presentations.



Dr. Mircea Ghergie graduated from the University of Medicine and Pharmacy Iuliu Hatieganu in Cluj Napoca, Romania in 1998, with the degree of Doctor in Dental Medicine. He also achieved a Masters Degree in Orthodontics in 2005. He works as a dentist in Romania since then, and started his own practice in Cluj-Napoca, in 2005. He has attended a variety of courses in USA, Italy, Israel and Germany, including a 1-year-long Aesthetic Curriculum in Stuttgart by Prof. Dr. Jürgen Manhart, in 2012.