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DENTAVANTGART

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INTERVIEW

GÉRALD UBASSY
A DESIRE TO
COMMUNICATE

DDS. SAID A. SÁNCHEZ &
DDS. FRANCISCO GARCÍA &
DDS., MDT. ERIC SÁNCHEZ

**USE OF MODIFIED
POLYETHERETHERKETONE
IN IMPLANT**

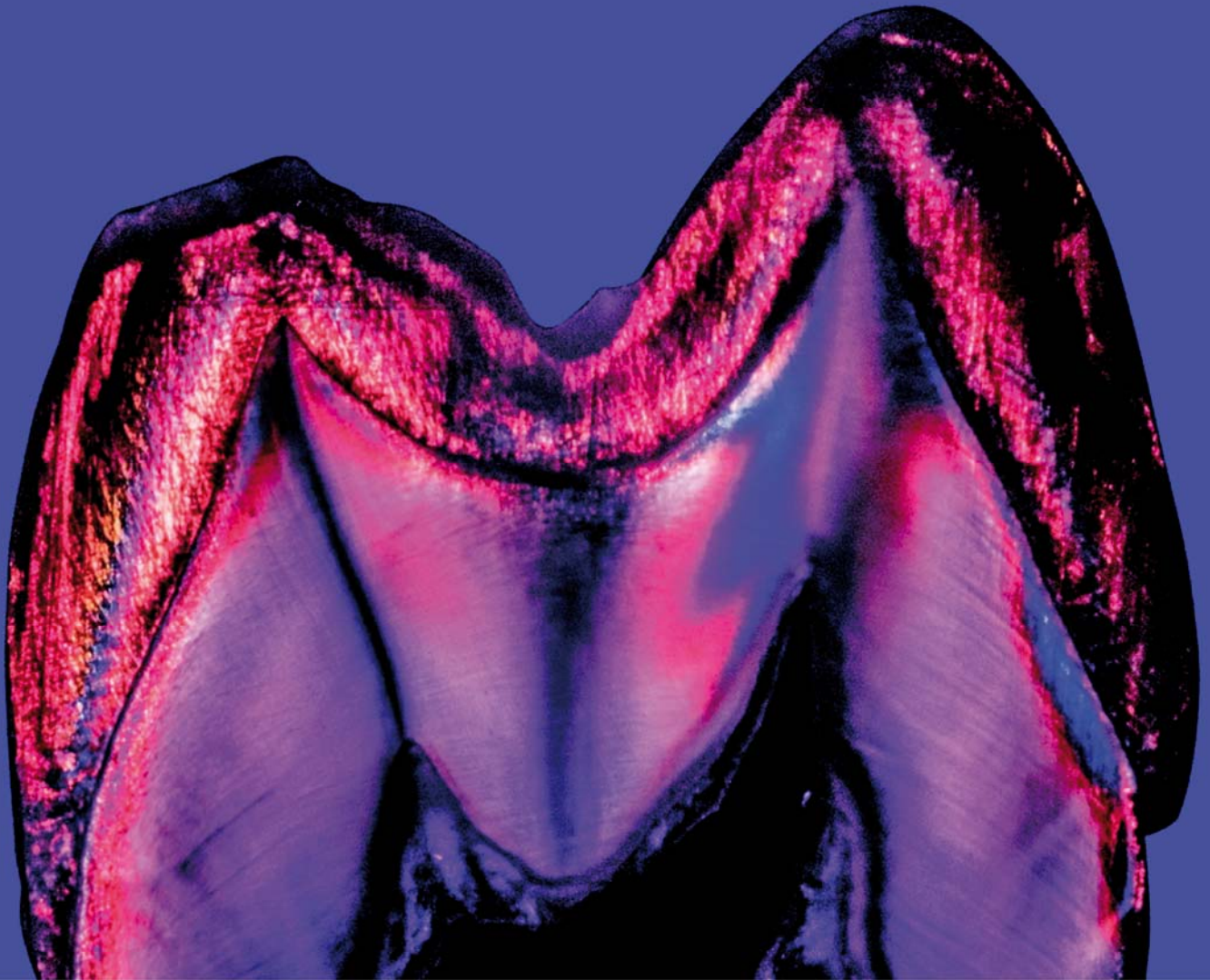
PROSTHODONTICS:

A METAL-FREE AND STRESS
BEARING ALTERNATIVE FOR
FIXED IMPLANT SUPPORTED
PROSTHESIS

DDS. GIORGOS
DIMITRAKOPOULOS &
DT. DIMITRIOS
KAMARIOTIS

**TREATING
AMELOGENESIS
IMPERFECTA**

A THERAPEUTIC
MULTIBONDING
OPTION



Zirkonzahn®



MAXILLARY PRETTAU® BRIDGE AND MANDIBULAR ELEMENTS IN PRETTAU® ANTERIOR®

Case first published in Quintessenz Zahntechnik issue 3, 2018

“Our job was challenging because it required high precision and the ability to find the right balance between aesthetics and function. Teeth are important not only for their aesthetical relevance in an individual’s face, but also for their role in assisting phonetics and facial muscles. We knew we were successful the minute the patient smiled!”

CASE MADE BY:

*DT., Dr. Arturo Godoy Sentfies,
Imagen Dental, Culiacán, Mexico*

In collaboration with

*Dr. José Alberto Valenzuela Soo,
Cosmetic and Implant Dentistry, Mexico*

*Zirkonzahn Education Center
Brunico, Italy*

*The case was made during the Individual Training
course at “Die Zirkonzahn Schule”.*

BASELINE SITUATION: CHALLENGES AND SOLUTIONS

What happened to the patient?

Following an accident during his military service, the patient had significant tooth damage. For 8 years, he had been wearing a removable denture made in resin and single-unit restorations in the lower jaw. However, the prosthesis' lack of stability resulted in masticatory problems, with further consequences on the patient's social life, preventing him from expressing himself facially. In view of a planned meeting with military service colleagues, the patient wished to show himself with a new restoration that could give him a more aesthetic smile and improve his self-confidence. At the age of 48, he then decided to present himself to the dentist Dr. José Alberto Valenzuela Soo. At the visit, the dentists noticed a lack of naturalness in the patient's face proportions wearing the old prosthesis: too short teeth in relation with the facial anatomy, the upper lip was too thin with an inward-oriented profile, left-inclined occlusal plane and downward smile (Figs. 1 and 2).



Figs. 1 and 2 The patient wearing the 8-year old prosthesis: too short teeth in relation with the face anatomy, too thin upper lip, inward-oriented profile, left-inclined occlusal plane and downward smile.



FIRST PHASE OF THE TREATMENT: THE IMPLANT PLACEMENT AND THE TEMPORARY RESTORATION

What were the challenges and the purposes of the treatment?

This case required the restoration of most of the patient's dental anatomy, with the double aim of improving the patient's facial anatomy and helping him acquire more self-confidence in his social life. This was what made this job a challenging case. From an aesthetic point of view, the main purpose of the dentist was to give the patient a new smile following the lower lip's curve. In order to meet both the dentist's and the patient's wishes successfully, the teeth had to be placed in an adequate position according to the correct dimensions and the anatomy. By examining the patient's mouth, the dentist observed that the maxillary bone was wide and large enough to hold an upper restoration supported by seven implants (16, 14, 12, 11, 22, 24, 26), which would also serve as facial and labial support. For the lower jaw, the dentist opted for a combined rehabilitation including onlays (34, 44, 45), crowns on prepared teeth (35, 33, 32, 31, 41, 42, 46), an implant (36) and a veneer (43).

What was the proposed solution?

Dr. José Alberto Valenzuela Soo worked on this case in combination with DT., Dr. Arturo Godoy Sentfes and in collaboration with Zirkonzahn's dental technicians, in the context of the Individual Training course provided by "Die Zirkonzahn Schule" (The Zirkonzahn School). When deciding the best option on terms of materials, the treatment team excluded the use of metals to avoid chipping problems. They opted instead for Prettau® Zirconia: this material, with a flexural strength of 1,200MPa, allows the creation of both fully anatomic prosthesis and reduced ones for the subsequent veneering with ceramics. The dental team decided to reduce the front teeth leaving the incisal edges in monolithic zirconia: in this way, avoiding layering the incisal edges, the chipping problem would be eliminated but still keeping a natural result thanks to the high translucency of the Prettau® Zirconia. In the reduced areas of the teeth, the dental technicians would apply several masses in order to give the restoration a more natural look. For the lower jaw, Prettau® Anterior® zirconia was chosen for its even higher translucency.

THE IMPLANT PLACEMENT

The first step of the job consisted of scanning the existing upper prosthesis. Based on this, a wax-up was then created and a prototype was milled in order to let the patient have a real preview of how the new restoration would fit in his mouth. After the patient's approval, the dental technicians made a total prosthesis from the wax-up, with 2 duplicates in transparent resin (Fig. 3).

The first one would be used as surgical guide to check the implants positions and guide their placement into the patient's mouth; the second one would be used during the tomography in order to examine the bone availability and the implant positions. After these steps, the dentist placed the seven implants (MIS implant system, internal hex) into the patient's mouth (Fig. 4).



Fig. 3: The duplicate of the prosthesis in transparent resin, used to guide the implants insertion into the patient's mouth.



Fig. 4: The implants placed into the patient's mouth.

THE TEMPORARY RESTORATION

Once the implants were placed into the patient's mouth, a duplicate of the implant situation was taken. To do so, the dental technicians placed a pick-up on every implant in the patient's mouth and then took an impression of the situation with silicone, using an open impression tray. It was possible to create a plaster model with the gingiva and the implants positions, which was then scanned and implemented in the software. In this phase of the treatment, the dental team also produced a temporary restoration for the patient in PMMA (teeth) veneered with Gingiva-Composites (Fig. 5), which he subsequently wore for six months, the necessary healing period for the bone and the gingiva. Even with just the temporary restoration the patient had a significant improvement in his profile, which was more natural-looking (Fig. 6).

Fig. 5: The temporary restoration in PMMA (teeth) veneered with Gingiva-Composites in the gingival area.

Fig. 6: The significant changes brought by the temporary restoration in the patient's physiognomy.



SECOND PHASE OF THE TREATMENT: SCANNING, DESIGNING AND MILLING THE FINAL RESTORATIONS

THE DIGITALISATION OF THE MAXILLARY MODEL AND THE MANDIBULAR ELEMENTS WITH THE S900 ARTI SCANNER

After the creation of the project in the Zirkonzahn.Archiv software, the dental technicians proceeded with the digitalisation of the maxillary model and the mandibular elements (Zirkonzahn.Scan). For the digitalisation of the maxilla, Scanmarkers were used, which enabled the detection of the implants positions and orientations in the software. For the creation of the Prettau® Bridge, the dental technicians took advantage of the CAD/CAM software module Prettau® Bridge: this module allowed them to design both the teeth and the gingiva and subsequently obtain a digital wax-up. In the teeth with implants (16, 14, 12, 11, 22, 24, 26), the option “screw-retained” was selected, in order to use the implants digital library. The patient’s temporary restoration was also scanned, in order to use it as reference for the new teeth set-up (Fig. 7).



Fig. 7: The digital version of the maxilla, with Scanmarkers.



Fig. 8: The digital version of the mandible.



Fig. 9: The digitalisation of the maxillary and mandibular models, as well as the registration of the articulator were performed with the new S900 ARTI scanner. This new scanner is equipped with 3 cameras, for a particularly high scan data density and depth detection.

For the digitalisation of the mandible (Fig. 8), where the dentist decided to create a combined case of full-contour crowns on prepared teeth, onlays, a veneer and one implant, DT., Dr. Godoy and Zirkonzahn’s dental technicians took scans of the adjacent teeth, the gingiva, the crowns as well as the onlays and also scanned the prosthesis with a White Scanmarker, in order to detect the implant position into tooth 36. Finally, they registered the articulator and, by scanning, they transferred the exact position of the analogic set-up to the digital world (Figs. 9 and 10).

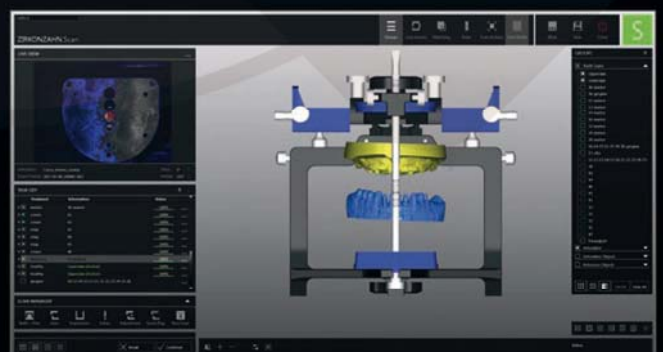


Fig. 10: The digital version of the mandible in the virtual articulator.

THE VIRTUAL DESIGN OF THE MAXILLARY PRETTAU® BRIDGE AND THE MANDIBULAR ELEMENTS

The design phase was performed in the Zirkonzahn.Modellier design software. For the maxillary Prettau® Bridge, Multi Unit Abutments from the MIS implant system, with a conical shape, were chosen. The Sealing Thread system was added (Fig. 11), in order to create a threaded screw channel, which would subsequently be sealed with resin screws milled directly in the laboratory from the specially created material Screw Blank. The next step consisted of the definition of the emergence profiles and the best dental anatomy from the Heroes Collection virtual library: for both jaws the AIDA tooth set was chosen (Fig. 12). Everything was then ready for the set-up. In the anterior region, a virtual cut-back using the Air form was performed (Fig. 13). With the Free Form Tool function, the dental technicians applied a few changes on the tooth shape, such as adjusting contact points and virtually designing the gingiva: first, they selected the insertion axis of the upper jaw. Once selected, the software loads automatically a virtual block-out over the model removing all undercuts, allowing the user to create a virtual gingiva (Fig. 14), which was subsequently modelled using the Free Form Tool function. For the lower jaw, the



Fig. 13: The virtual cut-back in the maxilla front teeth.

implant base Seven® & Biocon® (MIS standard) was chosen, which features a parallel shape with anti-rotation, making such bases the ideal solution in case of single-unit implants. The margin line was identified, together with the insertion axis of the veneers, the onlays and the crowns and the AIDA dental anatomy was selected for the subsequent teeth set-up (Fig. 15).



Fig. 11: The implant position detection and the sealing thread.



Fig. 14: The design of the gingiva.

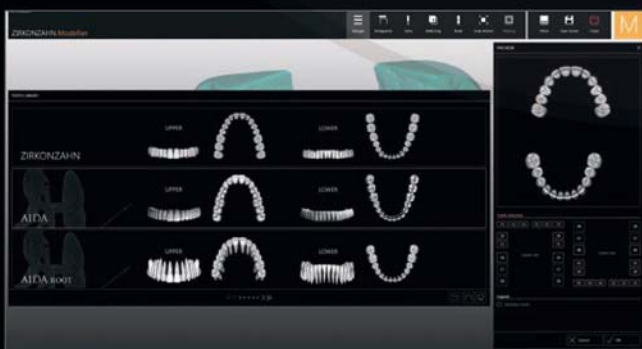


Fig. 12: The AIDA set from the Heroes Collection virtual tooth library.



Fig. 15: The definition of the insertion axis in the mandibular restoration.



Fig. 16: The mandibular restorations in the Prettau® Anterior® zirconia block. In the nesting software, it is possible to preview the burs' milling paths.



Fig. 17: The sealing screws milled out of the resin Screw Blank.

MILLING THE RESTORATIONS AND THE THREADED SCREW CHANNELS

In the Zirkonzahn.Nesting software, the CNC files were created for the subsequent milling. The upper bridge was milled out of a Prettau® Zirconia block. A stabiliser was added in order to avoid deformations and keep the material contraction linear during the sintering process. The stabiliser would then be cut after the colouring and sintering processes, before the layering step.

As a milling refinement, we chose the “High Quality” option to get the best result: the software chooses automatically the necessary tools and shows in advance all milling paths (Fig. 16). As for the lower jaw, we milled all restorations out of a Prettau® Anterior® zirconia block.

The new Zirkonzahn.Nesting software is equipped with a new function that allows the user to mill the threaded channels for the implants' sealing screws. In this case, a 1.8 G Zirconia milling tool was used to mill the thread, and the 1.5 A Zirconia bur was chosen for the screw channel. This new option also allows the dental laboratory to mill the sealing screws for the threaded channels out of the resin Screw Blank (Fig. 17). These serve as secondary sealing screws and seal the threaded channel keeping the internal titanium screw from loosening, which gives more stability. This new function allows the dentist to screw the restoration in a simple and

clean way into the patient's mouth. The dentist does not have to fill the channel with liquid resins any longer, nor remove the material during the controls of the implants: thanks to the threaded channels, the cleaning phase can be avoided, saving time. When the restoration has to be removed, the dentists simply has to take the screws out by means of an extractor fixed in the turbine. The screw channels stay intact and can be further sealed using a new resin screw. The two CNC files created in the Zirkonzahn.Nesting software were transferred into the Zirkonzahn.Fräsen software, for the milling of the structures in the M4 Wet Heavy Metal milling unit, which allows the user to mill the two zirconia blocks in just one milling process (Fig. 18).



Fig. 18: A virtual view of the M4 Wet Heavy Metal milling unit, which allows the user to mill more material blanks in one milling cycle.

THIRD PHASE OF THE TREATMENT: THE ART OF COLOURING ZIRCONIA



Fig. 19: The Prettau® Bridge after the colouring by infiltration using Colour Liquid Prettau® Aquarell.

The structures were coloured by infiltration, using the Colour Liquid Prettau® Aquarell for the Prettau® Bridge (Fig. 19) and the Colour Liquid Prettau® Anterior® Aquarell for the mandibular combined restoration.

After colouring, the structures were sintered in the Zirkonofen 700 Ultra-Vakuum sintering furnace, layered with ICE Zirkon Ceramics, glazed and polished (Figs. 20–22). The final restoration was then sent to the dentist, to provide the patient with his new, natural smile (Figs. 23 and 24).



Figs. 20 and 21: The Prettau® Bridge with the resin sealing screws and the mandibular elements after sintering.



Fig. 22: Veneering the Prettau® Bridge with ICE Zirkon Ceramics.



Figs. 23 and 24: The final restorations in the patient's mouth.



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DIE ZIRKONZAHN SCHULE

The Zirkonzahn School

NOTHING IS
UNREACHABLE!

**“DIE ZIRKONZAHN SCHULE” –
TOGETHER, WE WILL CREATE ANY
PATIENT CASE!**

Over the years, MDT. Enrico Steger (founder and owner of Zirkozahn) has developed a wide educational program, “Die Zirkozahn Schule” (The Zirkozahn School), where the company’s knowledge and experience is put into practice and delivered to their clients.

In this framework, to help dental technicians to perform the most complicated cases successfully, the Individual Training course was conceived. A qualified dental technician from

Zirkozahn will assist the treatment team in the manufacture of a difficult case, finding together the best solution for the patient with an efficient planning and a well-structured workflow.

For more information about the Individual Training and the school’s complete educational program visit www.zirkozahn-education.com.

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