

labline™

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EXCLUSIVE INTERVIEW

Many different traits can lead to success!

JÜRIG STUCK

LABLINE PHOTOGRAPHY - PART 2.

Dental Product Photography - A good photo is worth a thousand words

GIULIANO MOUSTAKIS

LABLINE ACADEMY

A Paradigm Shift in Alveolar Model Fabrication with 3D Printing

INGE MAGNE MDT

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COMPLETE RESTORATION IN PRETTAU® 2 DISPERSIVE® ZIRCONIA CEMENTED OVER TITANIUM BARS

PERFECT PASSIVITY BARS WITH IMPLANT SPLINTING TECHNIQUE

The patient, male, came to the attention of Dr. Vericat afflicted by severe periodontitis. The advanced stage of the infection required extraction of all teeth. The treatment was performed by DT Giovanni Nátile (article writer) and DT Michele Frapporti in collaboration with Dr. Alberto Vericat and Dr. Alejandro Arnau at Clínica Vericat Implantología Inmediata (Valencia, Spain).

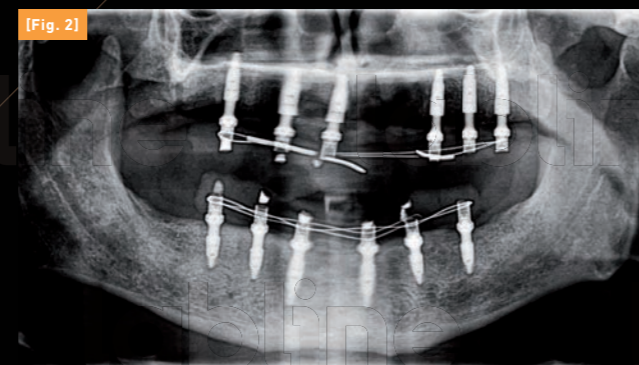
IMMEDIATE LOAD RESTORATION AND DIAGNOSTICS

“ During the surgical intervention for tooth extraction, Dr. Vericat placed six implants in the maxilla and six in the mandibular. By means of a conventional set-up, an immediate load reconstruction was produced in acrylic resin. This aimed at providing the patient with an aesthetic smile and regular masticatory function before

subsequent prototyping. On the same day, Dr. Alejandro Arnau acquired through conventional diagnostic methods all patient reference data: vertical dimension, centric relation, occlusal plane, midline. Such information is fundamental for the production of a final restoration that best integrates with the patient’s natural physiology. ”



[Fig. 1] The patient presented with severe periodontitis.



[Fig. 2] X-ray post-extraction and implant placement.



[Fig. 3] The immediate restoration made with acrylic resin, loaded on the same day of the surgery.



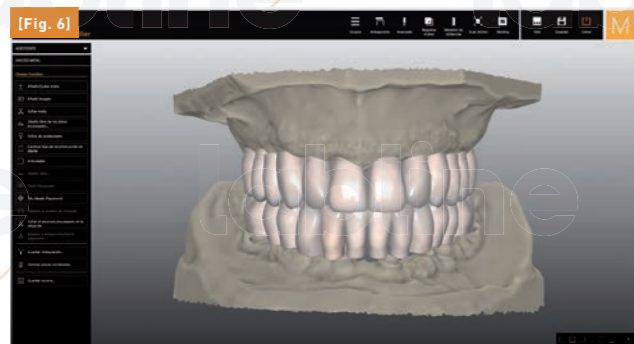
[Fig. 4] The model scans.



[Fig. 5] Initial analysis of matched patient data showed the immediate restoration was slightly divergent from patient's midline.

VIRTUAL MATCHING OF DATA AND PRODUCTION OF RESIN PROTOTYPES

“ The first stage of our working protocol consists of the virtual set-up starting from a matching of all available data: patient reference information acquired by the dentist as well as patient photos and scans of the immediate prostheses (scanned directly in the patient’s mouth through intraoral scanner). Zirkonzahn software allows us to scan and import the immediate restorations as situ-scans: this function is utterly important, since we can observe any imperfection and correct it in view of the final restoration. In this case, scans showed that the immediate restoration was slightly divergent from the patient’s midline so we corrected this aspect in the software. ”



“ For the set-up creation, we utilised one of the ten sets of dental anatomies available in the Heroes Collection virtual tooth libraries, included in the Zirkonzahn.Modeller design software. Once the most suitable tooth shapes were selected, we gradually implemented the gingiva. By matching 2D pictures of the patient and 3D model scans we could preview the aesthetic result in combination with the patient physiognomy. ”

[Fig. 6] Tooth anatomies for the set-up creation were selected from the Heroes Collection virtual tooth library, which comprises 10 tooth sets and is included in the Zirkonzahn.Modeller design software.

[Fig. 7] Set-up with teeth and gingiva.

[Fig. 8] Matching of 2D pictures and 3D dental models to tailor aesthetics to patient physiognomy. software.



“ When the virtual set-up was finished, we merged the virtual gingiva to the teeth and created a milling file. The file was then transferred to the Zirkonzahn.Nesting software, which simulates a milling path and calculates a milling strategy according to the selected material blank:



in this case, Temp Premium was chosen (Zirkonzahn's PMMA blank, Polymethylmethacrylate). After milling, our job continued with post-processing gingiva aesthetics with composites. ”



[Figs. 9 and 10] The virtual set-up previewed in the Zirkonzahn.Nesting software, ready to be milled out of a Temp Premium blank (Zirkonzahn's PMMA).

THE PROTOTYPE: A FUNDAMENTAL PHASE OF OUR WORKING PROTOCOL

“ The patient wore the immediate restoration for approximately three months. At this stage, Dr. Aranu took the final impression of the implants situation with implant splinting. This technique was fundamental to ensure a perfect passive fit of the final restoration. The patient was then given the prototype, which he wore for a period of six weeks. This is the necessary time lapse for the prototype to be functionalised by the patient. This part of the workflow is unavoidable for our team: only in this way can we

produce restorations that are optimally integrated with the patient's functional aspects. Temp Premium is a particularly durable material and during the six-week period, teeth wear in a totally natural and functional manner according to the patient's TMJ movements. In addition, the patient can gradually get used to the restoration and, together with the dentist, he can assess masticatory performance as well as aesthetic and functional aspects, which will be transferred in the final restoration. ”



[Figs. 11 and 12] The patient wore the prototype for six weeks. In this lapse of time, the prototypes are functionalised. The patient could also get used to them gradually and assess aesthetic and functional components that will be integrated in the final restoration.

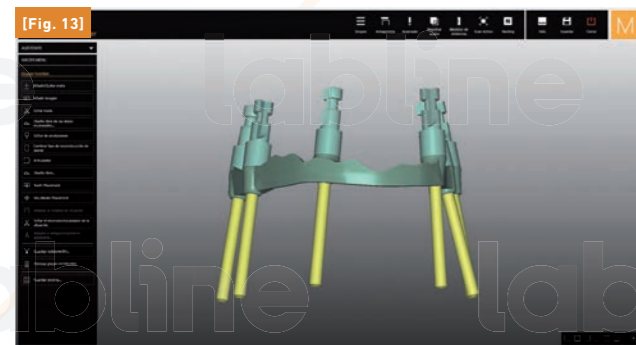
PRODUCTION OF THE FINAL RESTORATION

“ After functionalisation the prototypes were scanned with the aim of reproducing aesthetic and functional characteristics in the final zirconia restoration. The scans highlighted optimal reproduction of vertical dimension in both arches and, at the same time, showed a little cantilever caused by the positioning of implants. For this reason, we have decided to reinforce the zirconia with two titanium bars to be cemented internally. “

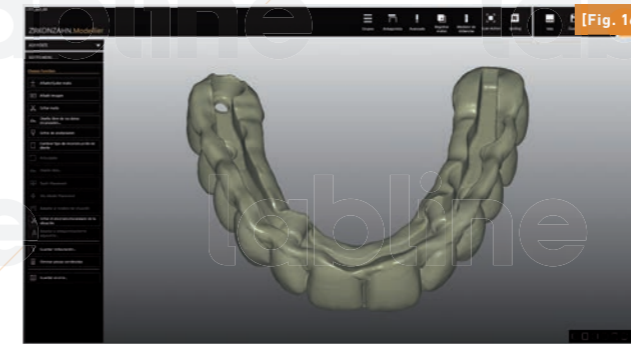
“ This solution offers a great advantage: indeed, titanium bars splint implant connections and totally support masticatory load. If on the one hand the zirconia features extreme hardness, on the other hand it lacks of flexibility and compared to metals it cannot be subject to torsions. If a zirconia structure does not show passivity, it could break during torque application on screws. This is the reason why Dr. Arnau splinted the implants during impression taking – in order to obtain a totally passive fit. “

“ After the bars design, the files were imported into Zirkozahn.Nesting and milled in Titan 5 (Zirkozahn’s titanium) with the M1 Wet Heavy Metal milling unit. For our laboratory, this machine really ticks all the boxes: it is space saving, but thanks to the wet processing function integrated,

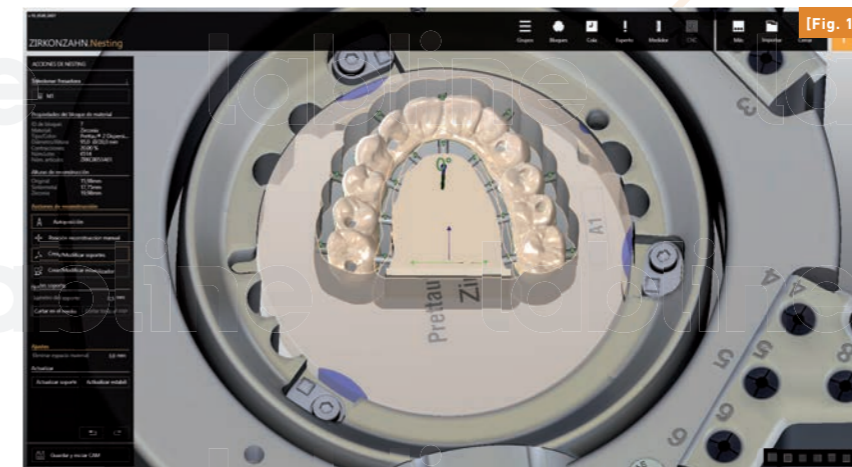
it permits milling metals too. We finished, polished and scanned the two primary structures. Then, we virtually adapted the prototypes to the two bars on the basis of the secondary structures, which we milled in a Prettau® 2 Dispersive® zirconia blank. “



[Figs. 13 to 15] The two titanium bars (Titan 5 by Zirkozahn), which were cemented into the zirconia structures, fulfil three different functions: they splint implant connections, reinforce the zirconia restorations and correct the cantilever. Already during impression taking, implants splinting was performed in order to obtain final structures with a totally passive fit.

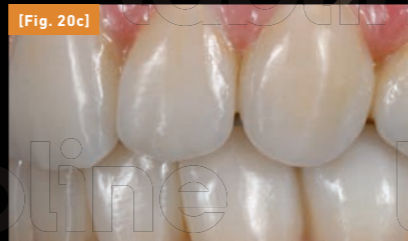
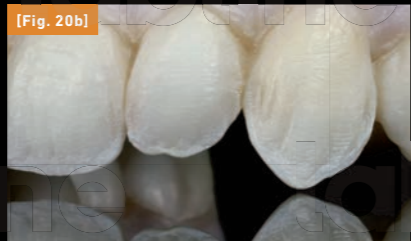


[Figs 16 and 17] The two secondary structures adapted to the previously designed titanium bars.



[Figs. 18 and 19] Nesting of the designed structures for milling them in a Prettau® 2 Dispersive® zirconia blank.

“ Prettau® 2 Dispersive® zirconia discloses its intrinsic chromatic effect and natural translucency after sintering. The material can be used with no further characterisation. However, in order to adapt it even more to the patient’s natural tooth colour we decided to carry out a minimal 0.4-mm cutback on vestibular areas (13-12-11-21-22-23 and 43-42-41-31-32-33) for a slight ceramics layering. After sintering, we applied glazing materials, ICE Stains 3D by Enrico Steger and ICE Ceramics (on the gingiva and non-functional areas). Finally, we cemented the titanium bars into the secondary structures and delivered the restoration to the dentist. “



[Figs. 20a to 20c] The zirconia structure: with a slight cutback; after sintering; after ceramics firing.



[Fig. 21c]



[Figs. 21a to 21c] The titanium bars cemented into the zirconia structures.

PRETTAU® 2 DISPERSIVE® ZIRCONIA: A PERFECT COMBINATION OF TRANSLUCENCY AND FLEXURAL STRENGTH FOR COMPLEX RESTORATIONS

“ For this restoration, we used the two best biocompatible dental materials available: zirconia and titanium. In particular, we opted for Zirkozahn’s polychromatic Prettau® 2 Dispersive® zirconia. This material is characterised by high translucency and flexural strength and permits manufacturing of complex restorations with high aesthetic values, even without ceramic layering. Like all Prettau® Dispersive® materials from Zirkozahn – our long-date partner and supplier – Prettau® 2 Dispersive® is characterised already during the manufacturing process by a smooth, natural colour gradient through a special technique that does not blend colours into layers but

disperses them evenly. This leads to a harmonious colour shade that is visible after the sintering process. We have been working with Zirkozahn’s materials and CAD/CAM systems for a long time and we have visited the company’s production sites in South Tyrol: dental materials, as well as hardware, software and implant prosthetic components are conceived, produced and tested in-house. This is why we have every confidence in this company and we can trust the high quality of the supplied products. “



[Figs. 22a to 22c] The final restoration made with Prettau® 2 Dispersive® zirconia in situ. From a functional point of view, the restoration offers a high level of comfort and safety during mastication and aesthetically it exceeded the patient’s expectations by far.



[Fig. 22a]



[Fig. 22b]



[Fig. 22c]

AUTHOR OF THE ARTICLE: DT GIOVANNI NÁTILE
CASE MADE AT CLÍNICA VERICAT IMPLANTOLOGÍA
INMEDIATA (VALENCIA, SPAIN) BY:

FINAL REMARKS

“ We have been very satisfied with the restoration delivered to the patient. The excellent outcome is the result, not only of a smooth workflow offered by our systems and materials, but also of the perfect collaboration with Dr. Vericat and Dr. Arnau. Fluid communication within the techno-clinical team is fundamental and must be accompanied by mutual trust and professionalism. We all follow our own protocols strictly, with measures and precautions that are important to adopt and to look at. From a dental technical point of view, for example, it is essential to observe carefully the instructions for use of the specific material, sintering temperatures, ceramic firings and passivity. In addition, ongoing learning is a powerful tool to build one's workflow and to make the most of one's devices and materials. I have to admit that with 'The Zirkonzahn School', Zirkonzahn has always stood by us in our constant learning path. The implants splinting technique adopted by Dr. Arnau for the final impression taking ensured a totally passivity of the structure. This is a reliable method that leads to stable and safe results.

I would really like to thank Zirkonzahn for the software and materials offered in the dental market. A big that you to Dr. Alberto Vericat, Dr. Alejandro Arnau and my colleague and friend Michele Frapporti, three great dental professionals. Together, we made a great team and this was the basis for a successful treatment. “

DT GIOVANNI NÁTILE

“ It's been an honour and a pleasure to carry out this work with a team of professionals of the highest level. From a surgical point of view, Dr. Vericat placed the implants in the optimal position for the restoration. The use of the intraoral scanners and photographs greatly facilitated our clinical and technical communication. The restoration is very satisfactory for the patient: from a functional point of view, it conveys a high level of safety and comfort during mastication, whereas aesthetically it exceeded his expectations by far. Giovanni Nátile and Michele Frapporti did a great job with the design and finishing of the restoration. “

DR. ALEJANDRO ARNAU



DT GIOVANNI NÁTILE

Manufacture of titanium bars and zirconia restoration,
bars cementation and ceramic layering.



DT MICHELE FRAPPORTI

Patient data registration, set-up creation, CAD/CAM design,
PMMA restoration production, CAD/CAM screenshots.



DR. ALEJANDRO ARNAU

Prosthetic dentist – Acquisition of patient photos and patient
data, impressions taking, try-ins, restorations insertion



DR. ALBERTO VERICAT

Dental surgeon, specialised in immediate loading implants
Surgery and implant placement.