

labline™

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LABLINE ACADEMY

Total Rehabilitation with Lithium Disilicate Ceramic Part #1

DR. ANA CRISTINA GOMES

TPD REINALDO F. NASCIMENTO

LABLINE PHOTOGRAPHY - PART 3.

Standardization, repeatability, protocol... is it boring? Clinical dental photography

GIULIANO MOUSTAKIS

CLINICAL CASE

Oral Rehabilitation and Management Part #2

FRANCISCO GARCÍA TORRES DDS

ERIC SÁNCHEZ DDS

ANTONIO CORRADINI

A CUSTOM-MADE SOLUTION

RESTORING EDENTULOUS ATROPHIC MAXILLA WITH FRESH AND YOUNG PRETTAU® 2 DISPERSIVE® ZIRCONIA TEETH SUPPORTED BY AN ANATOMICAL BAR



OPT data shows a severe loss of maxillary bone and vertical dimension. Due to the collapse of the upper arch a teeth and gingiva restoration was necessary for functional and aesthetic reasons. [A]

Virtual positioning of implants on the residual bone. Six implants are placed by means of a surgical guide and are immediately loaded with a temporary prosthesis. [B]

Implants after guided implant surgery. [C]

THE CLINICAL SITUATION

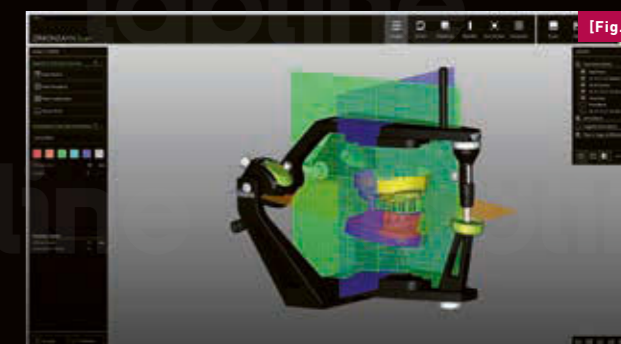
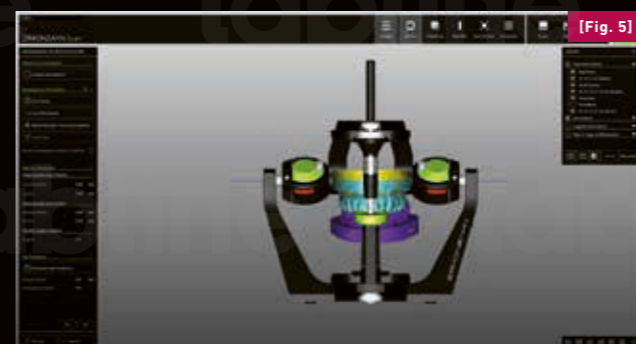
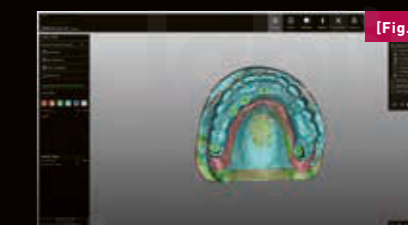
The dental technical team of Laboratorio Odontotecnico Lazetera was commissioned with the production of an aesthetic restoration to replace a complete removable maxillary prosthesis that no longer met the patient's aesthetic and functional requests. The patient wanted a fresh, implant-supported smile with white and young teeth. A complete study of OPT and CBCT data

showed a severe atrophic condition of the maxillary bone with complete reabsorption of alveolar bone and maxillary vertical dimension. An accurate implanto-prosthetic project associated with a virtual guided implant planning showed the opportunity to perform a computer guided implant surgery for immediate loading on six implants.

INTRODUCTION TO THE RESTORATION PRODUCTION

DT Federico Presicci, part of the dental technical team of Laboratorio Odontotecnico Lazetera, was commissioned with the production of the aesthetic restoration. DT Federico Presicci manufactured the restoration with Zirkonzahn's Prettau® 2 Dispersive® zirconia according to traditional working protocols. Due to the reduced

vertical dimension in the palatal area, the reinforcing titanium bar was individually designed for a perfect fit to the bridge. The Zirkonzahn workflow was utilised, with the new Zirkonzahn.Modifier add-on software, where innovative automation and workflow greatly facilitate the design of the Toronto bridges.



[Fig. 1] Case registration in the archive software.

[Fig. 2] The digitised antagonist model (mandibular)

[Fig. 3] Gingival model of the maxilla

[Fig. 4] Situ scans determine the correct relation of teeth in the mouth

[Fig. 5] Digital articulation of the set-up and the mandibular scan

[Fig. 6] Creation of individual reference planes for model adjustment based on patient-specific information (midline, occlusal plan...)

"I carried out this work according to traditional working methods. I scanned the maxillary and mandibular impressions using White Scanmarkers and based on such digital data I designed the first set-up for the production of

a first prototype. The set-up was mounted and articulated into the virtual PS1 articulator in relation with the lower jaw and reference planes were created based on further patient-specific information provided by the dentist".

FAST DESIGN OF SET-UPS IN THE NEW ZIRKONZAHN.MODIFIER ADD-ON SOFTWARE

"For the prototype design, I transferred the situ-scan data into the new Zirkonzahn.Modifier software and we created a wax-up. The prototype was designed based on the situ-scan, improving the old situation according to the dentist's demands. I eliminated all wear points, compensated impaired masticatory function and optimised intercuspation. By means of the new add-on software, I could design an accurate full arch in a considerably shorter time. Indeed, this software integrates the standard Zirkonzahn.Modellier software with valuable functions and automations that help to design full arches in a much faster way. A few functions that I consider particularly useful are the articulated rooted-tooth library

already provided with preset occlusions, the automatic gingiva design as well as the photorealistic preview of the restoration colours. When you select the tooth library, all teeth are already mounted in the optimal position and the gingiva is subsequently designed based on the tooth set-up. For the design of this restoration, I articulated the two jaws virtually to reproduce the patient-specific dynamic movements, I chose the optimal insertion axes blocking out undercuts and once the design was ready, I created a wax-up and transferred it into the Zirkonzahn.Modellier software for integration of the screw channels. The prototype was then milled in resin and layered with composites in the gingival area".



[Fig. 7] The models transferred to the add-on software and virtually articulated to reproduce the individual dynamic movements

[Fig. 8] The articulated rooted-tooth library with already aligned teeth

[Fig. 9] Photo-realistic preview of the design after automatic creation of the gingiva

[Fig. 10] Analogue and digital White Scanmarkers are matched in the design software in order to find the correct position and orientation of the laboratory analogues in the digital model

[Fig. 11] Screw channels are automatically created by the software

[Fig. 12] The STL file ready to be transferred to the nesting software

[Fig. 13] The resin prototype, layered with composites in the gingival area



[Fig. 14] The resin prototype, layered with composites in the gingiva area



CONSIDERATIONS ABOUT MATERIAL SELECTION

"After accurate verification during the try-in phase, the clinician made all necessary functional and aesthetic adjustments and sent the prototype back to our dental laboratory for the production of the final restoration. For this treatment, I considered zirconia the best material to meet the patient's wishes. As long as today's resins can be functionally and aesthetically pleasant, it is important to look at several factors when choosing the right materials for long-term usage, such as strength values, natural aesthetics, and long-term cost to the patient. Given these aspects, zirconia was then the material of choice for this treatment. Not only is zirconia a stronger and more natural-looking material but is also more biocompatible and prevents the risk of gingival disease. Besides, state-of-the-art CAD/CAM technologies permit manufacturing prostheses with an even more fit-precision, comfort and accuracy".

"The choice of the material led at this point to further considerations, this time involving the selection of the most appropriate zirconia among all the ones available in the market. For this case, I chose Prettau® 2 Dispersive® zirconia by Zirkonzahn. I greatly appreciate this new zirconia for its versatility, chromatic fidelity, high degree of translucency and faster processing

times. Although 'traditional' zirconia shows extremely high flexural strength values, its opaque color requires porcelain veneering to achieve natural aesthetics, which has a primary clinical disadvantage with high rates of porcelain fracture or tooth abrasion. The solution to the limitations of 'standard' zirconia is brought by the newest generation of polychromatic materials and Prettau® 2 Dispersive® falls into this material category. This material is a perfect compromise of high translucency and flexural strength, which is about 1.200 MPa. Most importantly, the material is already provided during the manufacturing process with a natural colour gradient, which permits a faster processing since characterisation is not required anymore. The special manufacture technique used does not blend colours into layers but disperses them evenly: the result is not a multilayer effect but a smooth, natural and harmonious colour gradient visible after the sintering process. For this treatment, to create an even more natural and patient-specific aesthetic result, I carried out a manual minimal cutback on the anterior teeth. In this way, I could apply a slight layer of ceramics in nonfunctional areas only (e.g. the gingival region or non-load-bearing regions), avoiding ceramic chipping."

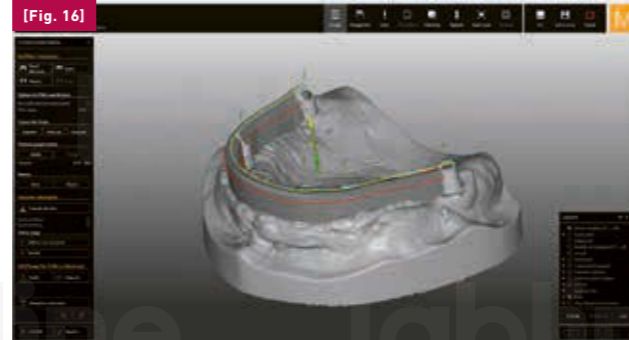
PRODUCTION OF THE FINAL RESTORATION

"I scanned the prototype tried by the patient and I imported it into the Zirkonzahn.Modellier software as a new situ-scan, which helped me determine the volume available for the bar in the structure. I designed the bar anatomically, following the sizes of the adjusted prototype, and I compensated the reduced vertical dimension in the palatal area to provide perfect support to the final prosthesis. Once the design was finished, I milled the bar in a titanium blank and adapted it to the

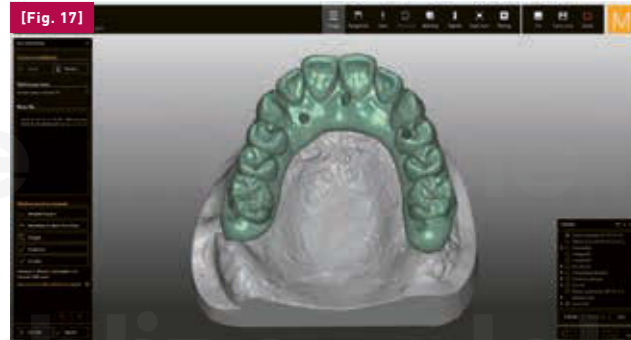
master model. At this point, I scanned again the model with the bar and used the digital data to adapt the prototype wax-up on it. The customised restoration was sent to the nesting software, where the structure was positioned in the Prettau® 2 Dispersive® zirconia blank and the CNC file was calculated. After milling, I personalised the structure with Colour Liquids and once the sintering process was concluded, for an even better natural-looking and individual result I applied a slight layer of ceramics."



[Fig. 15]



[Fig. 16]



[Fig. 17]



[Fig. 18]

[Fig. 15] The bar is designed based on the situ-scan of the prototype tried by the patient

[Fig. 16] The bar is designed anatomically in order to compensate the reduced vertical dimension in the palatal area and provide perfect support to the final prosthesis

[Fig. 17] Adaptation of the secondary structure to the scanned bar

[Fig. 18] The final job ready to be milled in a Prettau® 2 Dispersive® zirconia blank

[Fig. 19] The titanium bar milled and adapted to the master model before re-scanning



[Fig. 20] The milled restoration



[Fig. 21] Drafting the minimal cutback in vestibular areas



[Fig. 22] Mamelons are clearly visible in the minimally reduced structure



[Fig. 23] The refined palatal area



[Fig. 26] The restoration after sintering

[Fig. 27] The sintered restoration with the fit titanium bar



[Fig. 24 and 25] Slight personalisation with Colour
Liquids (blue and chromatic dentine colours)



[Fig. 28] Slight stratification with ceramics for improved individual aesthetics



The final restoration: maxillary Toronto bridge in Prettau® 2 Dispersive® zirconia over a cemented, anodised titanium bar.

[Fig. 29]



[Fig. 32]



[Fig. 33]



[Fig. 30]



[Fig. 31]



CASE MADE BY:



PROF. DR. MICHELE MANACORDA,
STUDIO MANACORDA,
MILAN, ITALY



DT FEDERICO PRESICCI,
LABORATORIO ODONTOTECNICO LAZETERA,
SAVONA, ITALY

SURGERY PERFORMED BY

PROF. DR. RAFFAELE VINCI & PROF. DR. MICHELE MANACORDA

[Fig. 34]

