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EXCLUSIVE INTERVIEW

Eric Van Der Winden

„Wanting to become good is a decision”

CLINICAL REPORT

Platinum Foil Technique

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PREDICTABLE AND REPRODUCIBLE FULL-ARCH REHABILITATION BASED ON THE 3D VIRTUAL PATIENT

CASE REPORT: SCREW-RETAINED COMPLETE REHABILITATION IN PRETTAU® 2 ZIRCONIA ON ANODISED TITANIUM BASES

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[1]

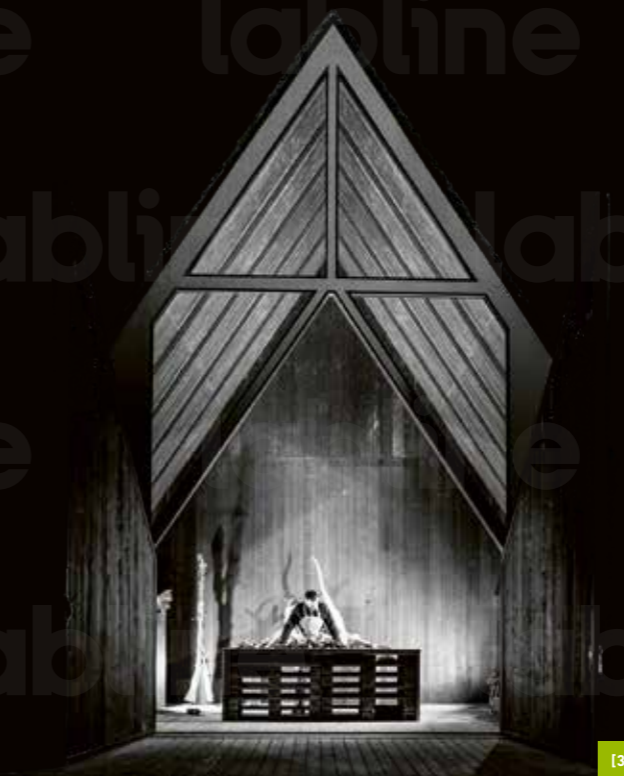


[2]

INITIAL SITUATION

The patient, female, presented with partial maxillary and mandibular edentulism. Each jaw contained unstable and suffering teeth (11 – 22 and 45 – 35). After careful evaluation of the clinical situation and deep analysis of the CBCT data, the dentist in cooperation with the dental technician opted for a screw-retained complete rehabilitation in zirconia based on a guided implant surgery.

[1-2] The initial situation: two jaws with unstable and suffering teeth 11 – 22 and 45 – 35.



[3]

[3] The Zirkonzahn School ("Die Zirkonzahn Schule") provides individualised training solutions to help dentists and dental technicians master a complete digital workflow starting from computer-tomography guided implant surgery.

The restorative material was decided only after committing to a guided implant surgical procedure based on digital assessment of potential implant positioning. Indeed, CT guided surgery permits the optimal positioning of implants for uniform distribution of masticatory forces. This technique brings, moreover, great benefits to both the treatment team and the patient. Not only is it more accurate and time-efficient - especially for full-arch rehabilitation - but it also improves the interdisciplinary collaboration between clinicians and technicians to the benefit of the patient, who is provided with an immediate prototype as a preview of the final restoration. However, guided surgery is an advanced implant procedure requiring skill, experience and willingness to invest time and money into continuing education. An intimate knowledge and understanding of underlying principles, surgical tools and CAD/CAM software is requisite to providing such treatment. At the Zirkonzahn School ("Die Zirkonzahn Schule") individualised training solutions help dentists and dental technicians master a complete digital workflow for guided implant surgery that puts patient function and aesthetic first.

PATIENT DIAGNOSTICS – THE PLANESYSTEM® INNOVATION

Dental implant surgery should be restoratively driven. By first establishing the ideal tooth position and morphology, a treatment team can reverse engineer implant surgery through digital implant planning based on functional and aesthetic tooth placement. To accurately establish and plan ideal restorations respective to natural patient harmony, precise acquisition of diagnostic data is imperative. According to these principles, the documented treatment was performed end-to-end with the Zirkonzahn complete digital workflow.

The Zirkonzahn digital workflow should start with PlaneSystem®, an innovative data transfer method developed in collaboration with MDT Udo Plaster (Germany). By means of the PlaneSystem®, dentists can reproducibly acquire patient-specific occlusal planes. Unlike traditional facebows based in skull-related references, the PlaneSystem® leverages patient-specific, skull-specific references. By measuring facial and oral landmarks (os zygomaticum, sulcus alaris, porus acusticus externus, stomion and sutura palatinum), the dentist can acquire the maxillary position respective to an ideal reference plane traceable to the horizon, also known as Natural Head Position. This permits the accurate and reproducible

registration of individual occlusal planes that respects patient asymmetry providing a reliable starting point for subsequent treatment steps.

For any restorative dental procedure - digital or analogue - patient-specific information recorded with the PlaneSystem® is transferable between the analogue and digital world in a 1:1 ratio without transmission error and thus stored in the software for future use.



[4] Unlike traditional facebows, which work on skull-related references, the PlaneSystem® works on skull-specific reference points. By measuring facial and oral landmarks the dentist can acquire the maxillary position with respect to an ideal reference plane traceable to the horizon (the Natural Head Position), registering the occlusal plane and asymmetries.

PATIENT DIAGNOSTICS – THE FACE HUNTER AND PLANE ANALYSER

Another key tool within the Zirkonzahn digital workflow is Face Hunter. This innovation allows clinicians to capture a patient's 3D facial scans, which merge with the occlusal information recorded previously with the PlaneSystem®. The final result is a complete 3D virtual reproduction of patient physiognomy and oral situation. For a more thorough 3D patient reproduction, the Plane Analyser (Zirkonzahn's computerised axiograph) can also be used to record and digitise patient condylar movements for individual adjustment of both the physical and virtual articulator.

In spite of the digital information available, for the present case also 2D pictures of the patient's face and oral situation were used, for their unique display of details especially from an intraoral point of view. DICOM data and the digitised impression of the initial situation were also used in the first phase of the treatment.



[5] Zirkonzahn's digital workflow increases planning reliability, predictability of outcomes and data reproducibility, offering a high degree of security. The data recorded by means of the PlaneSystem® can be transferred 1:1 into the software and matched with the patient's 3D face scans and condylar movement data. Based on such thorough information, the dental technician can design the immediate prototypes based on the dentist's virtual implant plan.

BENEFITS OF THE ZIRKONZAHN DIGITAL WORKFLOW

FOR TREATMENT TEAMS AND PATIENTS

Working with the ever-present 3D patient benefits both the treatment team and patient. Dentists and dental technicians now can perform a treatment plan without space and time limitations while reducing overall chairside appointments. This procedure also represents a new patient communication tool used to garner case acceptance prior to invasive treatment. The Zirkonzahn digital workflow improves precision and predictability of treatment outcomes, providing unprecedented security in complex, implant prosthodontics and full-arch dentistry. Indeed, prioritising individual occlusal function harmonious to a patient's natural situation avoids common complications like restorative failure, TMJ disorder, neck and back pain as well as headache.

DIGITAL IMPLANT PLANNING

The records captured during patient diagnostics were used for the implant planning process in a dedicated software called Zirkonzahn.Implant-Planner. The platform includes two versions, one for clinicians and one for dental technicians. Based on the recorded data, dental technicians can design the initial tooth setup in the CAD software for pre-op evaluation of function and aesthetic. The treatment team can quickly assess the application of various tooth anatomies available from Zirkonzahn's Heroes Collection virtual tooth library before proceeding with the surgical planning. Once the optimal tooth setup is determined, the clinician can leverage a robust store of implant systems, pins and sleeves to generate custom surgical guides, taking into account relative bone density, function and aesthetic.



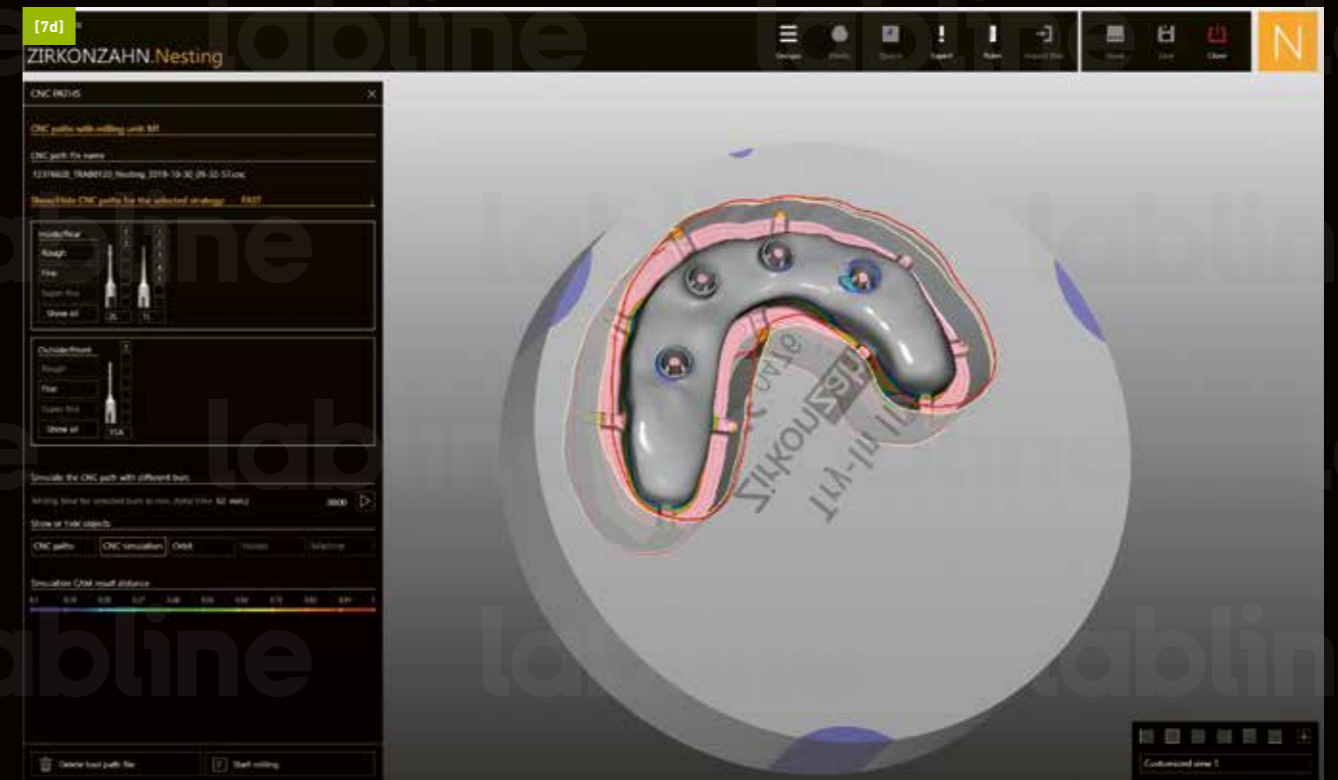
[6] Example of implant planning in the Zirkonzahn.Implant-Planner software. During the implant planning, which was performed taking bone density, function and aesthetic into account, the dentist can choose the implant system, the pins and the drilling sleeves directly from the extensive library included in the Zirkonzahn software.

FAST AND SMOOTH PRODUCTION OF THE IMMEDIATE PROTOTYPE

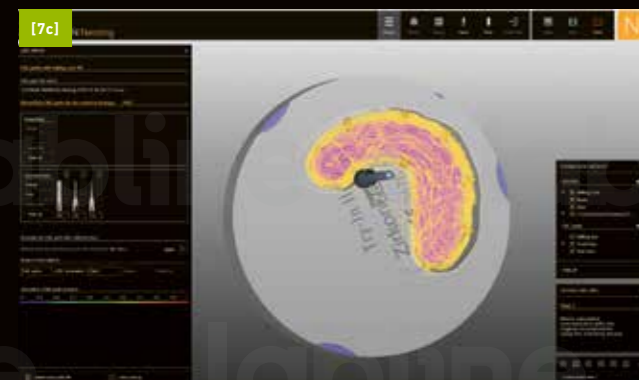
A complete range of implant prosthetic components - compatible with over 100 systems - is fully integrated in Zirkonzahn Software suite to guarantee optimal support of a restoration. Export functions in the Zirkonzahn Implant-Planner facilitate the transfer of a virtual implant model with corresponding Scanmarkers and ScanAnalogs back to the CAD software. Thus, the dental technician can adapt the virtual tooth setup to the planned implant components for pre-operative fabrication of an immediate provisional and mill implant model according to the surgical plan.

Alternatively, the new Double Milling technique can be implemented for more efficient post-processing. Double Milling allows restorations to be fabricated in two steps.

Technicians first mill the occlusal surface of the planned restoration prior to surgery. Implant positions are captured moments after placement and are provided to the technical team for quick post-op milling of the implant connection. The patient is thereby provided with a passive-fitting, immediate provisional without manual adaptation of the resin prototype to the implants. What is more, labs can still continue to mill other cases while waiting for the post-op impression. Advancements in milling machine technology like the Blank Repositioner Orbit and Holder allow technicians to remove and reinsert material blanks in the exact same position within the orbit to ensure precision results between the first and second milling cycle.



With the Double Milling technique, implant-supported restorations can be fabricated in two milling steps: the dental technician first mills the occlusal surface of the planned restoration (7a,b) and only after receiving the intraoral scans with the exact implant positions right after the surgery can he mill the implant connections (7c,d).



[8] An example of the complete package that labs can provide to dentists with Zirkonzahn's workflow, including surgical guides, custom impression trays, immediate prototypes as well as the corresponding implant models.



SURGICAL PHASE AND RESIN PROTOTYPING

With the implant planning concluded, tooth extraction, guided surgery and immediate provisionalisation were carried out in one surgical phase. The complete digitalisation of the patient's face and oral situation by means of the PlaneSystem® was then repeated with the patient wearing the immediate restoration. Based on

such data, the first prototype was designed and milled in Multistratum® Flexible resin, which the patient wore for five months. This is a key step in Zirkonzahn's digital workflow, leading to a successful final restoration: during these months, any adjustment is made naturally by the patient, as the bridge is naturally worked into function.



[9] The prototype design is based on the complete digitalisation of the patient's face and oral situation by means of the PlaneSystem® and the patient's specific reference planes.

[10 a, b, c] The prototype was designed in the Zirkonzahn.Modellier software. However, the new add-on Zirkonzahn.Modifier software can be used, which has been specifically developed for a fast design of set-ups and digital dentures.



[11] The two prototypes made of Multistratum® Flexible resin. The prototypes completely met the patient's expectations, both in terms of aesthetic and function. For the final zirconia restorations, the patient requested a copy of the prototypes with a very slight aesthetic adaptations.



The Prettau® Bridges after sintering (12 a,b) and after manual colouring with Colour Liquids (13 a,b).

[14-15 a,b,c] Final screw-retained complete rehabilitation in Prettau® 2 zirconia

on anodised titanium bases in-situ.



[14]

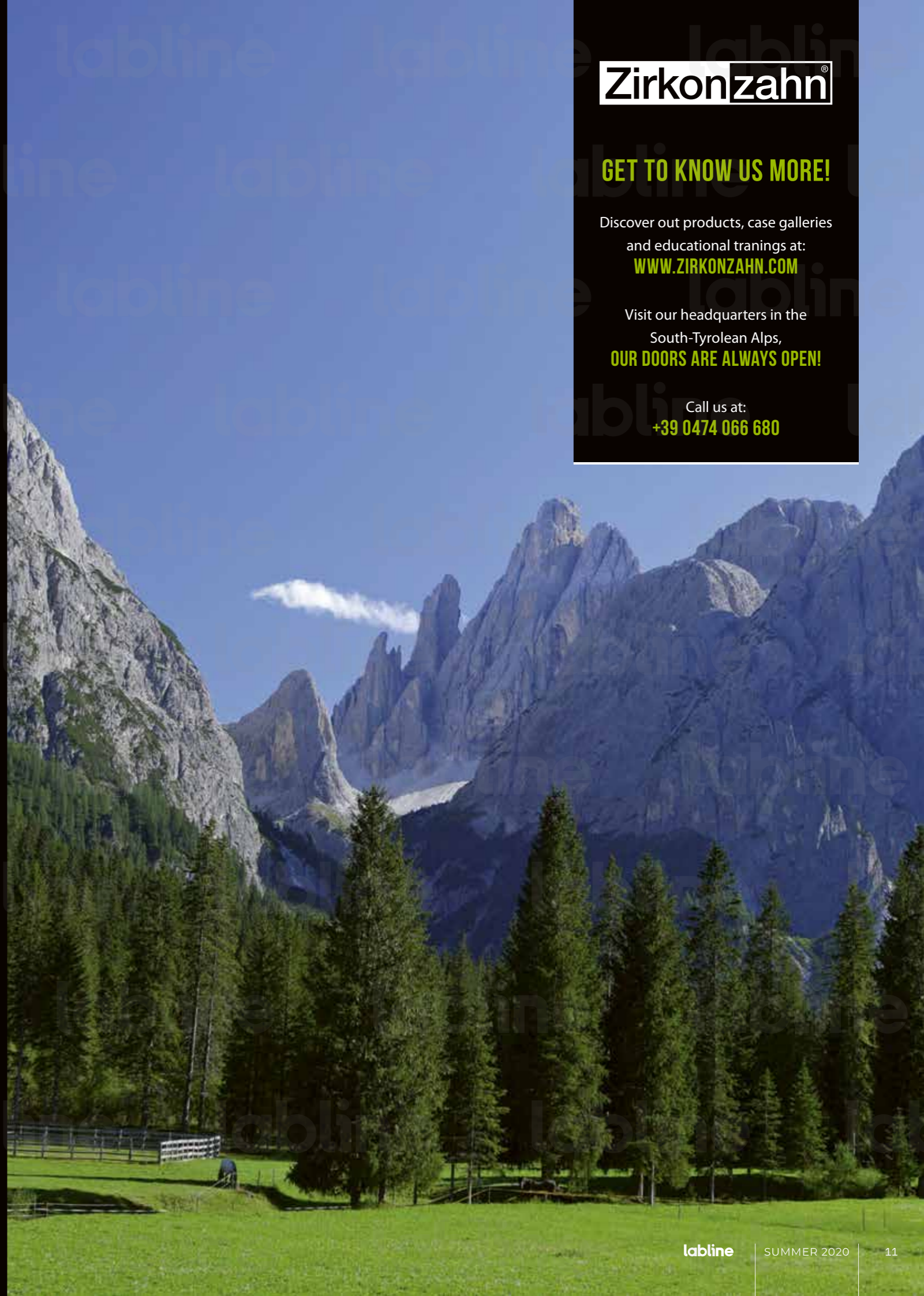
[15a]



[15b]



[15c]



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