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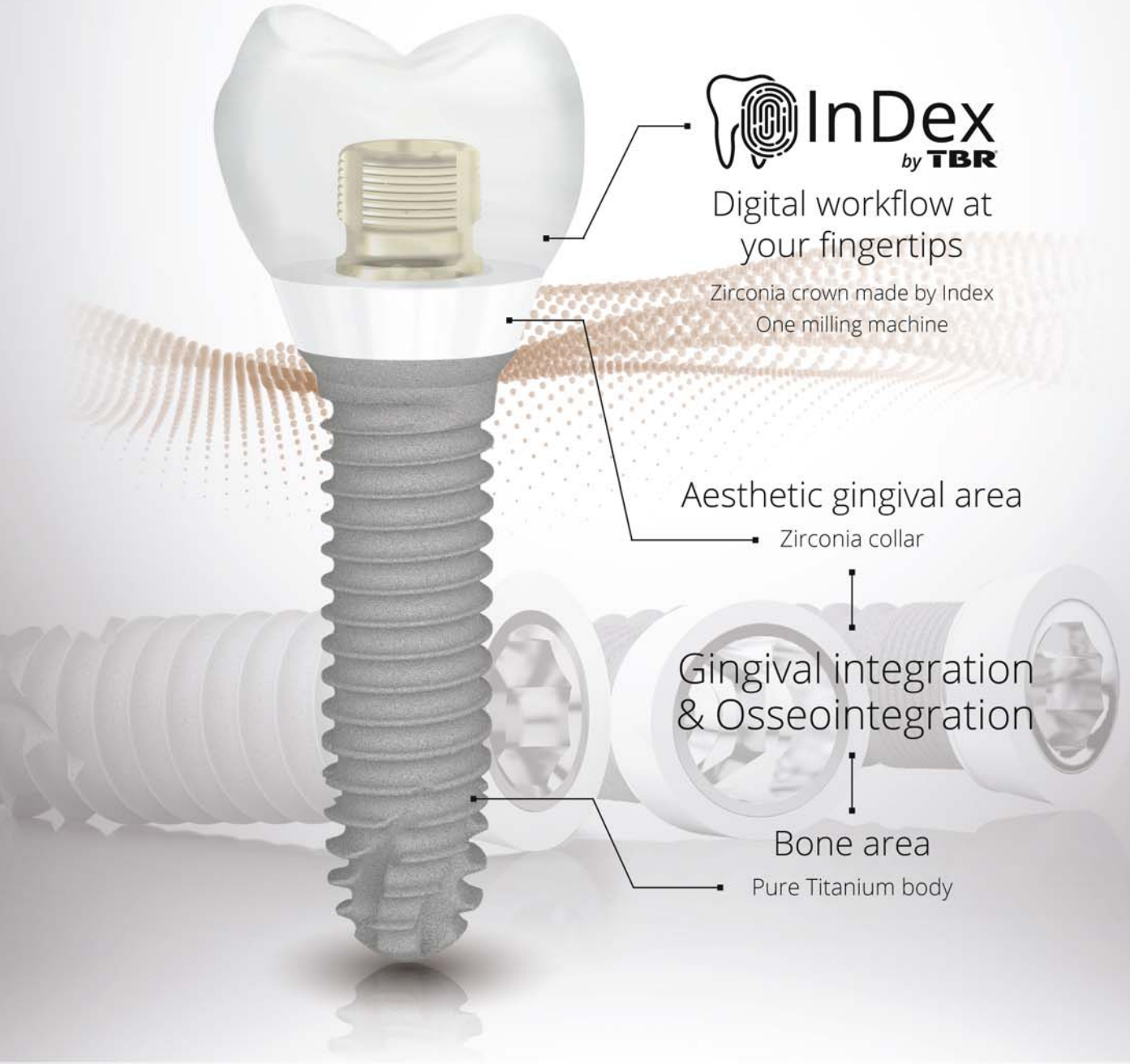

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Dr Georg Bach

President of the DGZI

The second half of this year will be crucial

Dear readers,

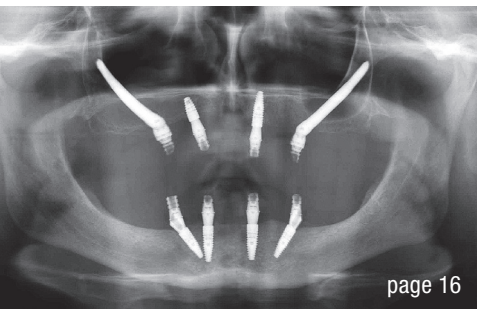
The crisis in the first half of 2020 has forced considerable challenges upon us, which are here to stay for the months and probably years to come. As is the case with many crises, however, there are also opportunities and positive aspects, in contrast to the economic damage and the structural disruptions. We as dentists, together with our teams, are currently doing everything we can to re-establish regular practice routines and to get our patients back into dental care—in accordance with the necessary infection prevention measures, of course. Recent weeks have shown that dentistry has a clear obligation regarding the general health of the population. There is no other medical profession that provides the population in all its variety with such regular care, through dentists working in public clinics and private practices. Especially within the German healthcare system, patients in risk groups, the old and the young, the chronically ill and emergency patients receive reliable dental treatment of the highest standard. After all, oral health plays a crucial part in maintaining the systemic health of patients. Untreated inflammation in the oral cavity, denture pressure points, caries, periodontal disease and other conditions can cause not only adverse situations in the masticatory apparatus but also damage to the entire body.

Dental implantology plays a key role here, being the only dental therapy capable of treating patients of nearly all age groups with a myriad of prosthetic possibilities and surgical protocols in such an individually tailored and sophisticated way. Undoubtedly, there is a medical necessity for and effectiveness in rehabilitating masticatory function with dental implants, even in high-risk patients. We as professional implantologists should thus continue our efforts with great courage to educate our patients regarding the best possible treatment options even in these challenging times. The second half of this year will be decisive in terms of not only crisis management but also further implantological training. In this light, it is my great pleasure to cordially invite you, on behalf of the German Association of Dental Implantology (DGZI), to Bremen in Germany on 6 and 7 November, for our 3rd Future Congress for Dental Implantology and a celebration of 50 years of DGZI.

With this in mind, I wish you an enlightening read with this new issue of *implants* and a healthy late summer and autumn. I look forward to welcoming you to our special anniversary congress in Bremen, the founding city of DGZI!

Yours,

Dr Georg Bach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Er:YAG laser scanner for implant site preparation

Drs Norberto Berna, Giovanni Olivi, Luca Marigo & Massimo Cordaro, Italy

Introduction

Numerous studies have reported the ability of mid-infrared lasers (Er:YAG laser with a wavelength of 2,940 nm and Er,Cr:YSGG laser with a wavelength of 2,780 nm) to ablate hard biological tissue without creating thermal damage.[1–5] Among the various applications, the possibility of preparing the implant site entirely with laser irradiation was originally illustrated *in vivo* by Dr Berna, one of the authors of this article, in 2003. A patent for this form and method was issued and registered at that time. The first group of 62 patients received this method of treatment, using an Er,Cr:YSGG laser, between November 2001 and December 2002. Since then, another larger group of patients have been treated with this method. An Er:YAG laser and a dedicated laser scanner handpiece have never been used in human patients for this procedure, however. The major obstacles to the wide use of this technique are the time to create the osteotomy,[6] the low energy capability of the devices previously available and the time required to learn to use a handpiece that works in no contact. In the present study, a high performance Er:YAG laser was used with a tipless laser scanner handpiece that allows more precision, a higher energy output and a shorter pulse duration in comparison with the previously used device.

Materials and methods

A 67-year-old patient, a non-smoker without any systemic diseases, was examined using CBCT (PaX-i3D Smart, Vatech) in order to assess the surgical area, the bone volume and the bone density in the edentulous area, region #15 (Fig. 1). Before the surgery, the patient

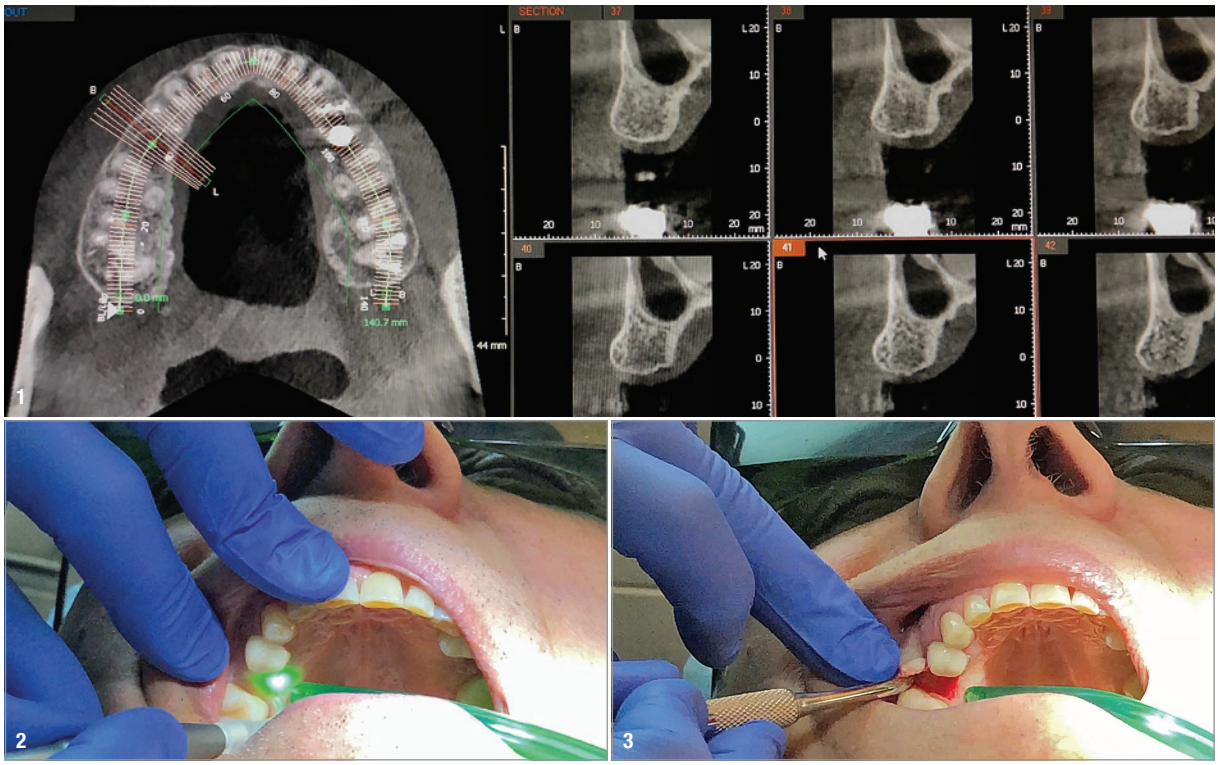

Fig. 1: A CBCT scan was taken pre-op. **Fig. 2:** Flap incision using a LightWalker Nd:YAG laser head (200 µm diameter fibre, 3 W, 70 Hz, MSP). **Fig. 3:** Flap reflection was carried out with a Prichard elevator.

EXCEPTIONALLY NO ADVERTISING AT THIS POINT, BUT A GREAT THANK YOU TO EVERYONE WHO HAS RESEARCHED AND DEVELOPED WITH US IN THE PAST YEARS.

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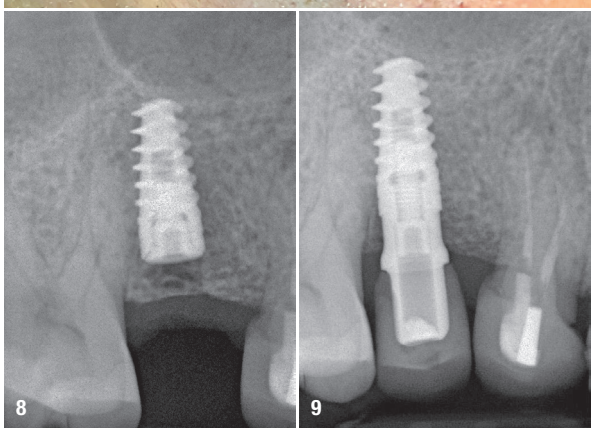

Fig. 4: The stabilised laser preparing the osteotomy, operated at 380 mJ, 20 Hz and 50 microseconds. **Fig. 5:** The Osstell handpiece detecting primary stability. **Fig. 6:** Determining the ISQ value. **Fig. 7:** Clinical situation post-op. **Fig. 8:** Radiograph taken immediately after surgery. **Fig. 9:** Radiograph taken after eight months of loading.

had received all the information regarding the treatment and the possible alternative treatment through a personalised informed consent form. The implant insertion axis has been planned for the best functional result of the prosthesis. A customised dental resin holder was created to support the laser scanner handpiece intra-orally, in the correct position according to the insertion axis of the implant. Local anaesthesia was administered using articaine (1 : 100,000). A full-thickness incision was performed using an Nd:YAG laser (1,064 nm wavelength; 200 µm diameter fibre; MSP: 3 W, 70 Hz; LightWalker AT, Fotona) on the palatal paramedian line; two mesial and distal releasing incisions were also performed without involving the papillae (Fig. 2). The access flap was then reflected with a Prichard elevator (Fig. 3).

An Er:YAG laser with a wavelength of 2,940 nm (LightWalker AT) equipped with a laser scanner handpiece (X-Runner, Fotona) was used (Fig. 4). The laser parameters used were 380 mJ and 20 Hz, delivered with a super-short pulse (50 microseconds). An external source of sterile saline solution stored at 5 °C in a refrigerator was used, and the saline was delivered via a peristaltic pump to promote photothermal ablation and to reduce the temperature in the surgical site. The scanner allows one to program and precisely perform a circular osteotomy of 3.5 mm in diameter, the same diameter as the implant manufacturer's final drill. During the osteotomy, the insertion depth was checked using a millimetre probe, until the preset depth of 12 mm was reached. The author prefers to place implants 2 mm deeper sub-crestally to prevent angular resorption and to manage the emergence profile of the prosthesis more effectively. A tapered screw implant made of Grade IV titanium and with a sandblasted and acid-etched surface (HELI, IDC) was inserted. It had a maximum diameter of 4.2 mm on the external thread and a length of 10.0 mm. Once inserted, the implant stability quotient (ISQ) was determined using the Osstell handpiece (Osstell; Figs. 5 & 6). The flap was sutured (Fig. 7), a postoperative radiograph was taken (Fig. 8), and after five days, the sutures were removed. At that time, the patient was asked to assess the postoperative pain he had experienced by assigning a numeric value of between 0 and 10 on a verbal numeric scale.

Results

The total clinical time for preparing the osteotomy was approximately 7 minutes. The implant had a high primary stability value at the time of insertion: the ISQ score measured in the buccolingual direction was 84 and the score measured in the mesiodistal direction was 81. The reported numeric value of postoperative pain was 1. At the second stage of the implant treatment, which was performed after 40 days, new ISQ values of 84 buccolingually and 82 mesiodistally were determined. After three months, the values had increased to 86 buccolingually

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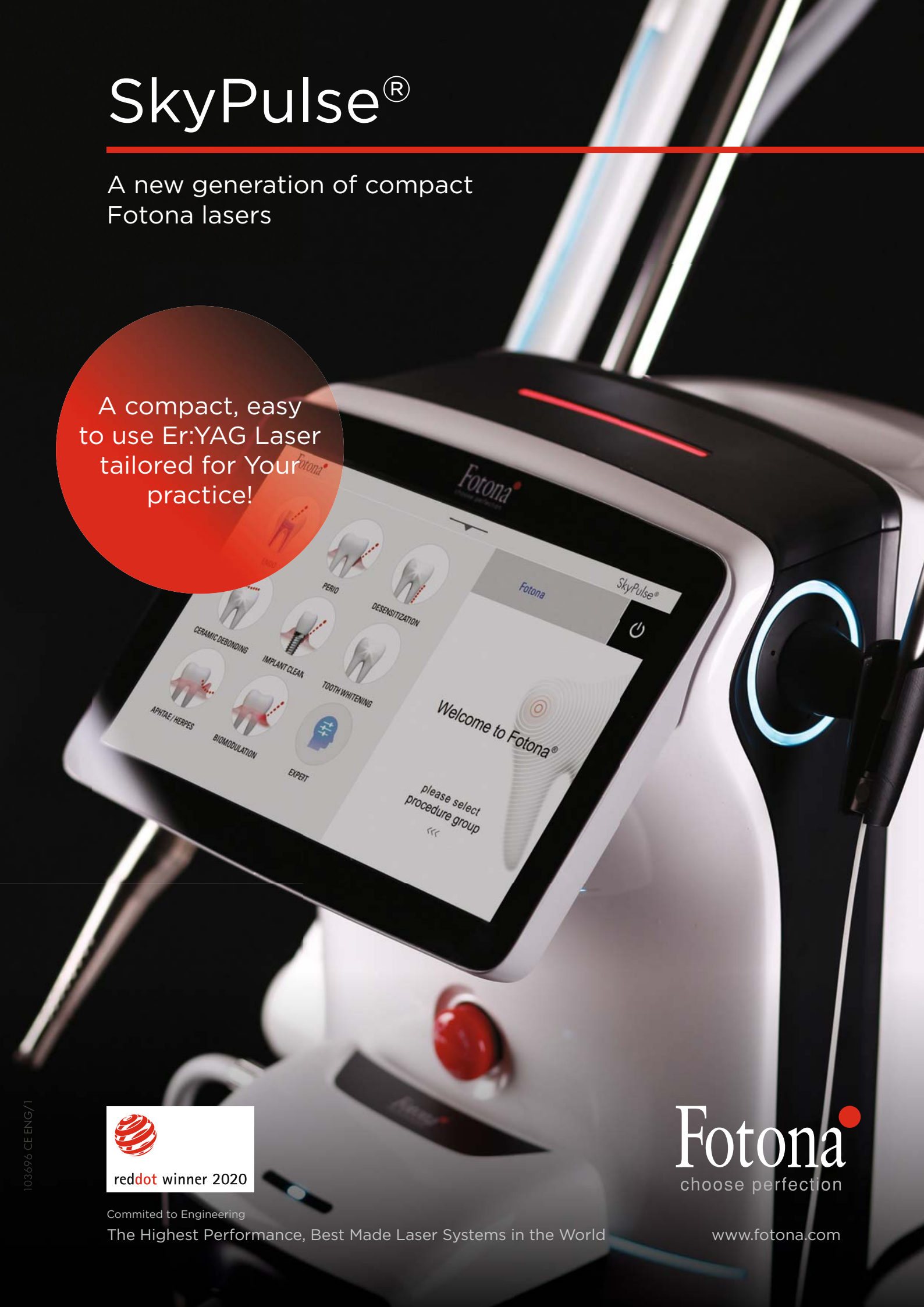

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