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_case study
ZERAMEX XT Ceramic implant: One-year followup

_events
AO first of several meetings canceled due to COVID-19


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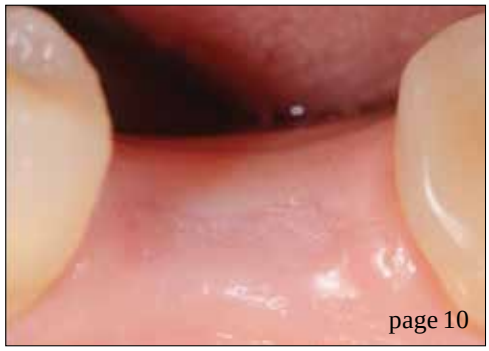
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on the cover

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To learn more about ZERAMEX XT, see page 10.


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Predictable implant uncovery with diode laser

Author_Gregori M. Kurtzman, DDS, MAGD, DICOI, DADIA, DIDIA

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_Introduction

Dental implants are placed either utilizing a one-stage approach (healing abutment placed at implant placement) or a two-stage approach (implant is covered by soft tissue at time of placement) and modification of the soft tissue to expose the implant fully may be required.

When the prosthetic phase is initiated, soft tissue is either removed to uncover the implants or reshaped at gingival margin for better esthetics, which can be accomplished by several methods. A cutting instrument (i.e., scalpel or tissue punch[1]) has been the traditional approach to incise through the soft tissue to the underlying implant.

The result is a bleeding edge that can interfere with impressions if they are to be taken at the same appointment. Additionally, postoperative sensitivity has been reported and can result from the fresh cut edge. Typically a delay of two weeks or longer is required before impressions can be taken, so that bleeding doesn't hamper the accuracy of how the soft tissue is captured.

An alternative to the blade, electrosurgery has been offered as it can cauterize the cut edges and decrease postoperative bleeding. Yet, this presents with two negative outcomes to its use in and around dental implants.

Electrosurgery requires a circuit be formed between the monopolar tip intraorally and the surgical unit with a grounding plate placed on the patient a distance from the oral cavity. When the current is activated, it flows between the electrosurgery tip through the soft tissue to the grounding plate, completing the circuit with the metallic implant conducting the current along the path.[2] It's been reported that temperature increases exceeding a threshold of 10 degrees C at the osseous interface with the implant may lead to bone loss and possible de-integration of the implant. A general recommendation is to avoid electrosurgery units in and around dental implants.

As electrosurgery affects cell layers deep to the surface (deeper penetrating), combined with the temperature increase, tissue shrinkage is often reported.[3] A delay between uncovery and impressions allows the cut edge of gingival tissue to stabilize and is required so the gingival margin

Fig.1_Picasso Lite+ Diode Laser (AMD LASERS). Photos/Provided by Dr. Gregori M. Kurtzman

Fig. 1

Fig. 2_Comparison of the depth of affected cells with an electrosurgery unit and a diode laser.

Fig. 2

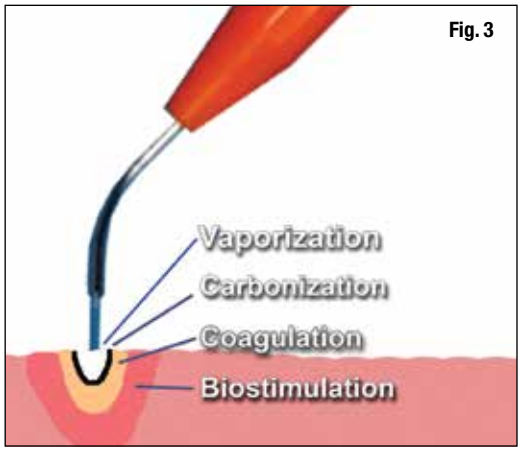


Fig. 3

captured is stable when the prosthetics is returned for insertion.

Diode lasers are increasingly being utilized in dental practices because of both lower costs to implement this technology than the more expensive CO^2 and ND:YAG lasers and the wide range of effective treatment afforded by these devices. Diode lasers, such as the Picasso Lite+ (AMD Lasers, West Jordan, Utah, *www.amdlasers.com*) (Fig. 1), provide adequate power to modify soft tissue in and around the dental implant for uncovery or alteration of the gingival margin to improve the esthetics.

Additionally, these operate within the temperature range recommended, so that the negative effects associated with electrosurgery do not occur to the bone around the implant.[4] Coagulation can also be controlled combined with the lack of tissue shrinkage after use of the diode laser allowing impressions to be taken at the time of uncovery. As the diode laser affects fewer cell layers, tissue response does not involve an inflammatory response that can lead to tissue shrinkage during the healing period the first few weeks after treatment (Fig. 2).[5-9]

_Utilization of the diode laser

Diode lasers are primarily used in a contact application when cutting or coagulation is required.[10] The diode laser tip is used in either an initiated state or an uninitiated state. Initiated refers to the tip of the diode laser, which has been coated with a blocking material. This allows energy from the diode, when activated, to heat the tip causing cell ablation (vaporization) at the contact point with cutting resulting.[11] The light energy in the coated tip is converted into heat by refraction of the blocking material on the diodes tip creating a "hot tip."

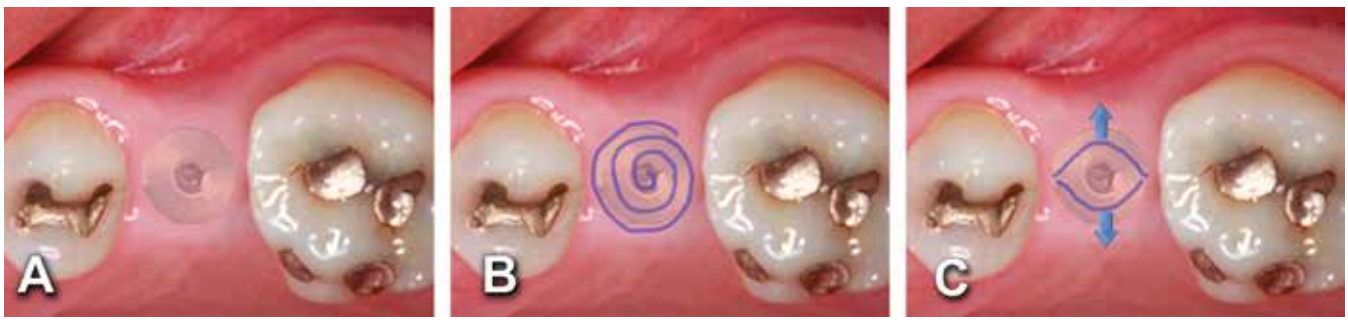
This secondary thermal effect of the heated tip allows cutting or incising of the soft tissue, resulting in an area of carbonization at the border of the vaporization. Coagulation occurs in the tissue bordering this zone of carbonization as a result of contact with the overheated tip rather than by the laser energy itself (Fig. 3).

Bacterial decontamination can be accomplished with an unitiated diode tip, which is useful in treatment of peri-implantitis on the implants' surface or within the periodontal sulcus/pocket around implants and natural teeth.

Initiation of the tip is accomplished with the diode set at 0.5 watts and touched to a piece of blue articulating paper (Bausch Ref BK05), and the laser is activated for one second. This is repeated six to eight times, contacting different areas of the tip so that when finished the entire tip and 3-4 mm of the

Fig. 3_Tissue reaction upon contact with an initiated diode laser tip, demonstrating the effect as one moves away from the tip.

Figs. 4a-c_Implant to be uncovered (4a) presents with two options depending on width of attached gingiva available. Wide band of attached gingiva will remain after removal of tissue over cover screw, and the diode is utilized in a spiral pattern starting at center until fully exposed (4b). With the narrow band of attached gingiva present, an elliptical cut is made with the diode and tissue is pushed buccally and lingually to preserve the attached gingiva (4c).



Figs. 4a-c

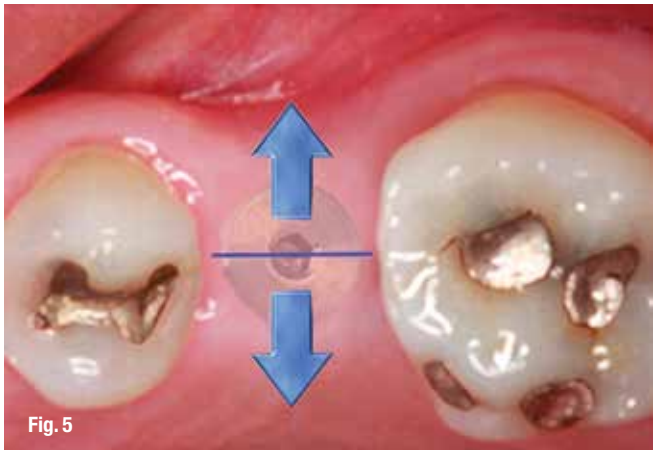


Fig. 5

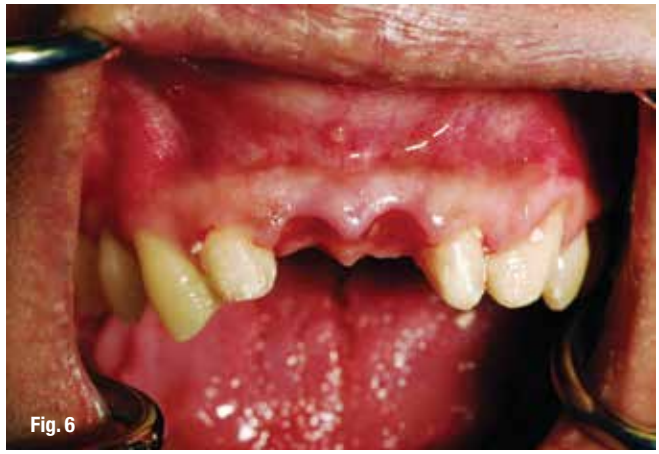


Fig. 6

Fig. 5_When minimal keratinized gingiva is present, the diode laser is utilized to make an incision distal-mesially, and the tissue is spread conserving all of the attached gingiva present.

Fig. 6_Buccal view of the anterior maxilla demonstrating preservation of the papilla due to the provisional bridge.

sides have been marked with the articulating paper. It is recommended to avoid articulating ribbon as it will ignite and is ineffective in initiating the tip. A properly initiated tip will glow orange when the foot pedal is depressed.[12]

The tip should be wiped with a piece of dry gauze to remove debris periodically as it is being utilized to maintain efficiency. When cutting fibrous tissue, it may be necessary to reinitiate the tip during the procedure if the tip appears to not be cutting well.

Cutting efficiency is related to wattage. The higher the wattage, the faster the soft tissue is vaporized. But a greater zone of unwanted lateral thermal damage may result. It is advised to use the lowest wattage to accomplish the task to avoid the risk of thermal damage within the adjacent tissue. The assistant during usage of the diode laser uses the HVE near the site to remove any odors and periodically can spray water on the site to aid in cooling the tissue.

This also minimizes thermal issues, which improves initial healing. To remove the soft tissue covering the implants' cover screw or reshape the tissue for esthetics, a setting of 0.8-1.0 watts in a continuous mode is usually sufficient. A 400 micron diode tip (orange) is utilized for oral and periodontal surgical applications. The 300 micron tip (purple) is designed for periodontal applications such as Laser Assisted Periodontal Treatment (LAPT).

Beyond the carbonization zone, an area of hemostasis (coagulation) occurs. Typically, sites treated with the diode laser will demonstrate little to no bleeding depending on the condition of the tissue prior to treatment. Tissue that is hemorrhagic will require longer contact with the diode laser to achieve coagulation and may ooze due to the inflammation present prior to laser treatment. The coagulation effects and lack of post-treatment tissue shrinkage allow immediate implant impressions should that be desired.

The laser also creates an area of biostimulation adjacent to the coagulation area.

Following irradiation with a diode laser, tissues and cells have a biostimulatory effect that provides faster or more favorable wound healing compared with tissue treated with a scalpel or electrosurgical unit. The laser irradiation stimulates the proliferation of mesenchymal stem cells without DNA alterations in the affected cells.[13] Thus, wound healing is enhanced and soft tissue at the cut edges demonstrates faster healing than when treated with a scalpel or other methods by stimulation of gingival fibroblasts inducing growth factors.[14,15]

It has been reported that biostimulation via the diode laser also has a positive effect on bone cells and can be stimulatory to the bone cells at the crest around the implant.[16,17] Compared with conventional methods, tissue healing as well as postoperative sensitivity is less with the diode laser than with other methods.[18]

_Implant uncovery technical considerations

The width of attached gingiva remaining will dictate the best method for implant uncovery (Fig. 4a). When a wide band of attached gingiva is present and a sufficient amount (3 mm or greater) will be present after uncovery on both the buccal and lingual, then the diode laser is activated and inserted at the center of the site and worked in a spiral pattern outward until the entire cover screw is exposed (Fig. 4b).

A curette or other instrument may be necessary to loosen the tissue over the cover screw as the periosteum becomes adherent to the titanium cover screw during implant healing. Sites that present with a narrow width of attached gingiva of 3-5 mm at the crest's center will require some conservation

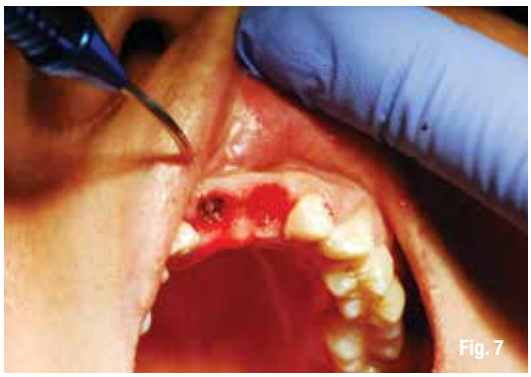


Fig. 7

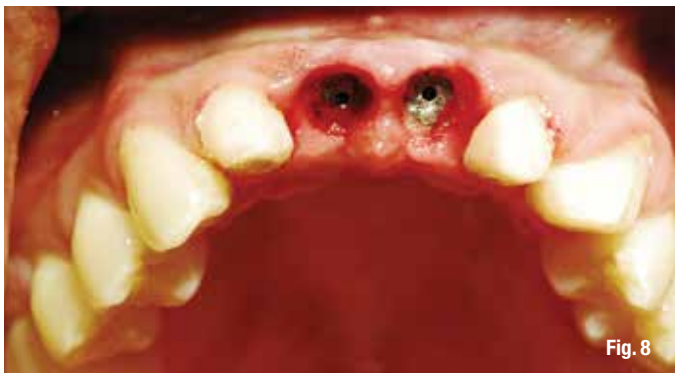


Fig. 8

of the remaining attached gingiva. In this clinical situation, the diode is utilized to remove an elliptical piece of soft tissue over the cover screw, and then the tissue is pushed buccally and lingually to preserve the attached gingiva (Fig. 4c).

If less attached gingiva is present on either side of the center of the crest, then the practitioner will need to preserve all of the attached gingiva present, and a conventional flap is recommended to be able to position the tissue in a more apical direction. When this is necessary, incisions can be made with the diode laser as an alternative to a scalpel (Fig. 5).

_Case report

A 30-year-old female patient presented with severely malposed maxillary central incisors tipped facially and a desire for esthetic improvement. A CBCT was taken and minimal bone was noted present over the facial of the central incisors.

Options for treatment were presented to the patient that included: orthodontics to correct esthetics or extraction of the central incisors, placement of implants at these sites and restorations on the anterior teeth. The patient indicated she did not wish to pursue an orthodontic treatment option because of the time involved.

The patient presented for surgery and the central incisors were atraumatically extracted under local anesthetic. The adjacent teeth were prepared for crowns, which would support a provisional bridge during the healing/integration period. A 4-mm wide, 24-degree Co-Axis Implant (Keystone Dental, Burlington, Mass.) was placed into the osteotomy at each central incisor orienting the prosthetic axis to a vertical position, while the implant's body followed the trajectory of the premaxilla.

A healing screw was placed and osseous graft material (NovaBone, Alachua, Fla.) placed on the facial to thicken the resulting bone. The soft tissue was closed with resorbable PGA sutures. A stent created over the wax-up of the study models that had been modified was filled with an auto-cure provisional resin (Perfectemp 10, DenMat, Lompoc, Calif.) and seated over the anterior and allowed to set. Upon setting, the stent with provisional was removed intraorally and trimmed and polished. At the implant sites, the material was shaped to a bullet shape to assist in forming an emergence profile in the soft tissue and preserve the papillas.

Six months post-implant placement, the provisional bridge was removed and preservation of the papillas was confirmed with a natural emergence profile within soft tissue (Figs. 6,7). Local anesthetic was administered. The Picasso Lite+ diode laser was set at 2.5 watts in continuous mode with an initiated tip and at the center of the depression in the soft tissue above the implants cover screw and moved in a circular motion moving outward until the entire cover screw was exposed (Fig. 8).

The process cuts the desired soft tissue and coagulates any bleeding from the cut edges. This was then repeated on the second implant (Fig. 9). Open tray implant impression abutments were placed into the implants and seating verified radiographically. An impression of the maxillary arch was taken utilizing Aquasil heavy body VPS (Dentsply Sirona, Milford, Del.) in a Mira Advanced Implant tray (Hager Worldwide, Hickory, N.C.) and Aquasil Ultra syringed around the preparations and implant abutment heads.

Healing abutments were placed into the implants (Fig. 10). The previously placed provisional bridge was tried in and modified at the pontics to allow the bridge to fully seat over the healing abutments and luted with a provisional cement (Fuji Temp LT, GC America, Alsip, Ill.).

Two weeks later, the prosthetics returned from the lab (DenMat Labs, Lompoc, Calif.) and the provisional bridge was removed. The healing abutments were removed, and the soft tissue demonstrated a lack of inflammation and a good periodontal health where it had been modified by the diode laser (Fig. 11).

Ceramic crowns were tried in on teeth 7, 10 and 11, and the screw-retained zirconia-based implant

Fig. 7_Occlusal view of the anterior maxilla demonstrating preservation of the papilla due to the provisional bridge.

Fig. 8_Picasso Lite+ diode laser removing soft tissue to uncover the implants' cover screws.

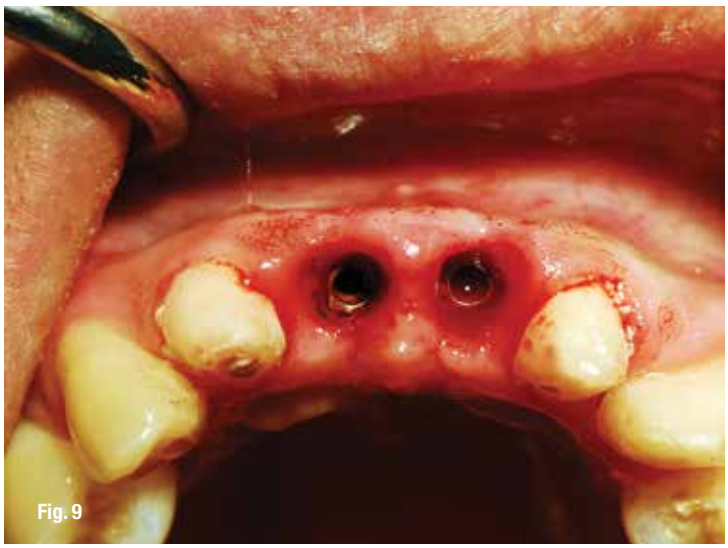


Fig. 9

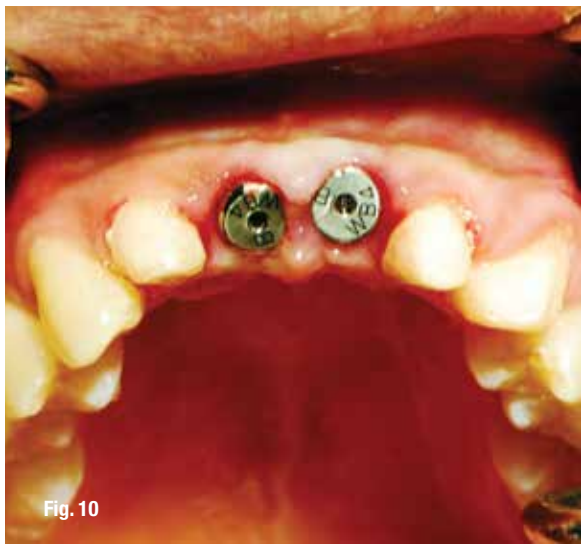


Fig. 10

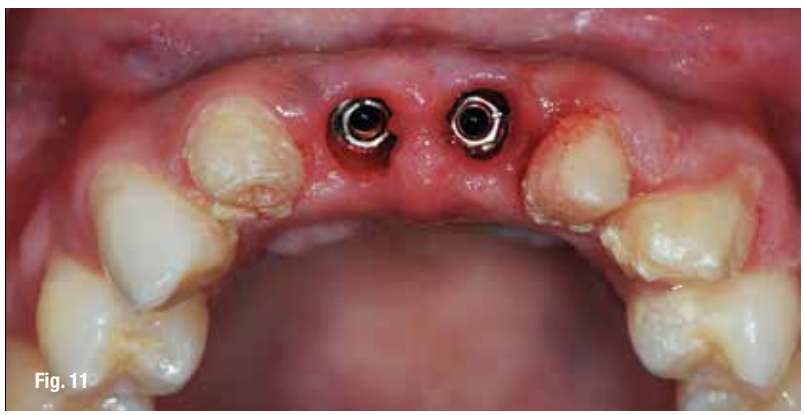


Fig. 11

Fig. 9_Uncovery of the implants and healing screws exposed.

Fig. 10_Healing abutments placed into the implants.

Fig. 11_Removal of the healing abutments at two weeks post-uncovery demonstrates a lack of inflammation of the modified soft tissue.

crowns inserted. A radiograph was taken verifying fit of the implant prosthetics. A torque wrench was utilized to tighten the fixation screws on the implants to 30 Ncm, and the ceramic crowns were luted with Panavia SA resin cement (Kuraray, New York, N.Y.). Occlusion was checked and adjusted where needed.

_Conclusion

Diode lasers are a useful adjunct to soft-tissue modification to uncover dental implants or esthetically recontour the gingival margin. They provide better safety than electrosurgery, maintaining a temperature profile within the safety zone of bone and do not cause tissue shrinkage that can affect the esthetic outcome. As the diode's tip provides simultaneous cutting and coagulation (hemostasis), a clear advantage to the use of a scalpel or tissue punch is that immediate impressions can be accomplished without site bleeding affecting the accuracy of the capture of the soft-tissue contours and position._

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_about the author

Dr. Gregori M. Kurtzman is in private general practice in Silver Spring, Md., and is a former assistant clinical professor at University of Maryland and a former AAID implant maxi-course assistant program director at Howard University College of Dentistry. He has lectured internationally on the topics of restorative dentistry, endodontics, implant surgery, removable and fixed prosthetics and periodontics and has published more than 700 articles. He can be reached at *dr_kurtzman@maryland-implants.com.*

The next generation: Two-piece, metal-free screwed ZERAMEX XT

Author_ Jens Tartsch, DMD

_This case involved a simple placement of an implant in a site with adequate bone in an overall healthy patient.

The case is significant in that it was the first case ever worldwide using the ZERAMEX®XT Ceramic Implant System.

ZERAMEX XT is a two-piece, screw-retained system that functions surgically and restoratively like current titanium implants.

This case shows a ZERAMEX XT 4.2 x 10 mm implant placed in a healed extraction and grafted site. The implant placement was done four months post-tooth extraction and grafting.

The implant was restored using the VICARBO Carbon Fiber screw and zirconia abutment.

At the one-year followup with the patient, the implant shows no peri-implant inflammation. In addition, no movement or bone loss can be observed.

The author requests that you read each photo caption to receive a good understanding of each step of the process.

This case was completed in Zurich, Switzerland, by Dr. Jens Tartsch. He practices in Zurich and is a founding father of the European Society of Ceramic Implants. ESCI is a connection between industry leaders and clinical users of ceramic implants working together to create the designs and technologies for proven future success._

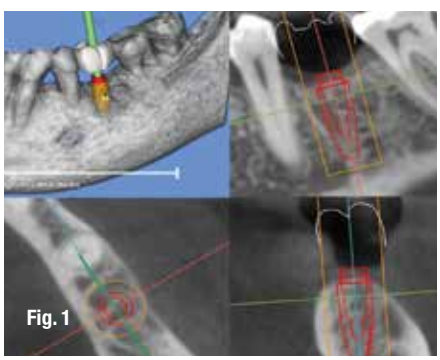


Fig. 1_Diagnostic 3-D treatment planning. Implant dimension and position with SMOP guided-surgery system. (Photos/Provided by Jens Tartsch, DMD)

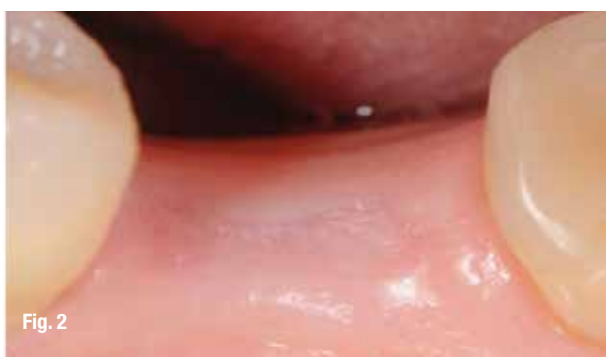


Fig. 2_Four months post extraction.

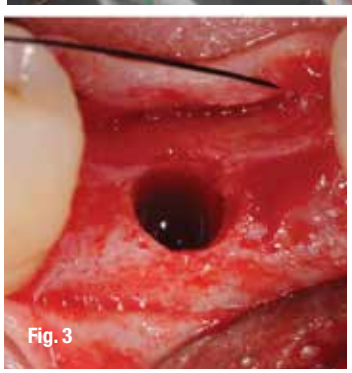


Fig. 3_ Prepared implant bed after thread cutting.

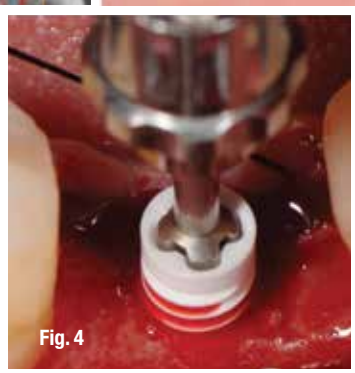


Fig. 4_Insertion with bolt in tube; inserting instrument max torque 25 Ncm.

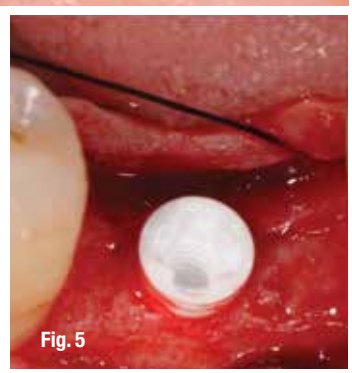
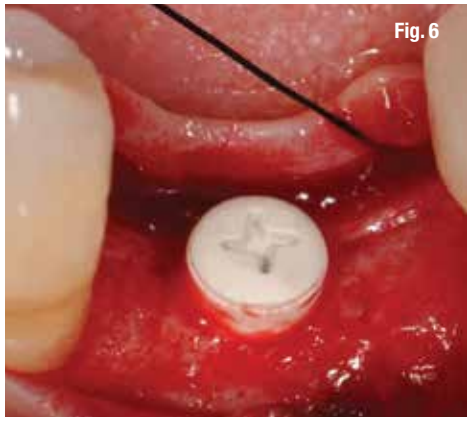
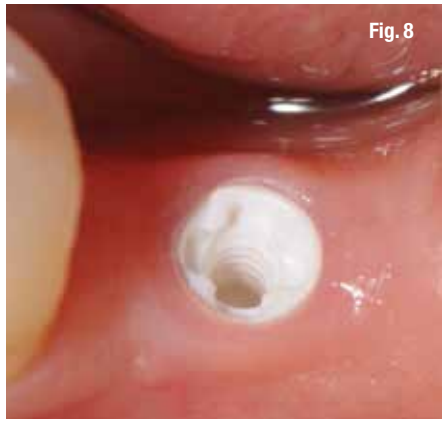


Fig. 5_Implant in situ; neck area 0.6 mm supracrestal.





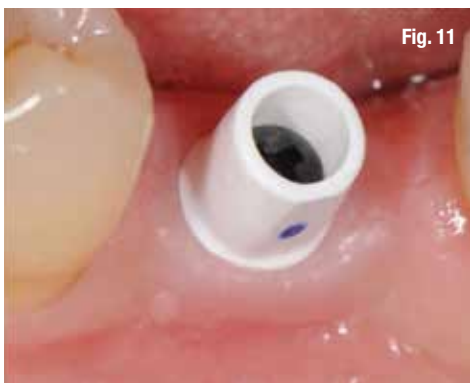


Fig. 6_The flat healing cap allows a primary wound closure, guided-surgery system.

Fig. 7_Healing period with healing cap ZERAMEX XT.

Fig. 8_ZERAMEX XT implant ready for impression.

Fig. 9_Precise impression with open tray.

Fig. 10_Individualized abutment on master cast.

Fig. 11_Abutment.

Fig. 12_Crown with composite closure of screw access channel.

Fig. 13_X-ray control after surgery and one year post-loading.

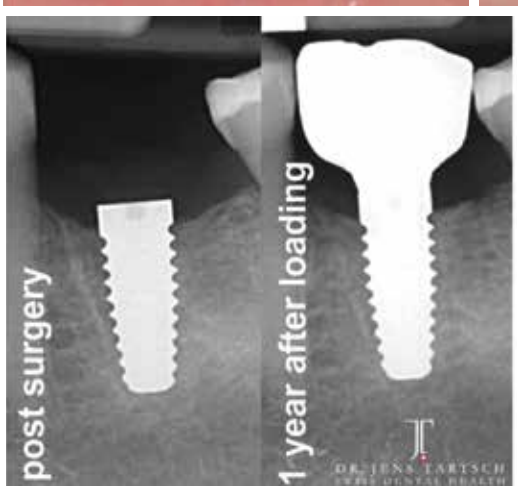


Fig. 13

_about the author

Dr. med. dent. Jens Tartsch, DMD, was born in 1965, and he received his DDS at the Free University Berlin (examination 1992). He is president and member on the board of directors for the European Society for Ceramic Implantology (ESCI). He is a member of the board of Swiss Society for Anti Aging Medicine and Prevention (SSAAMP). He is an international educator and author for metal-free implantology and immunology in dentistry and, specifically, oral and maxillofacial surgery. He has conducted clinical studies on the immunology of titanium implants, and considers his primary aspects to be: immunology in dentistry, metal-free implantology and dentures, and esthetic dentistry.

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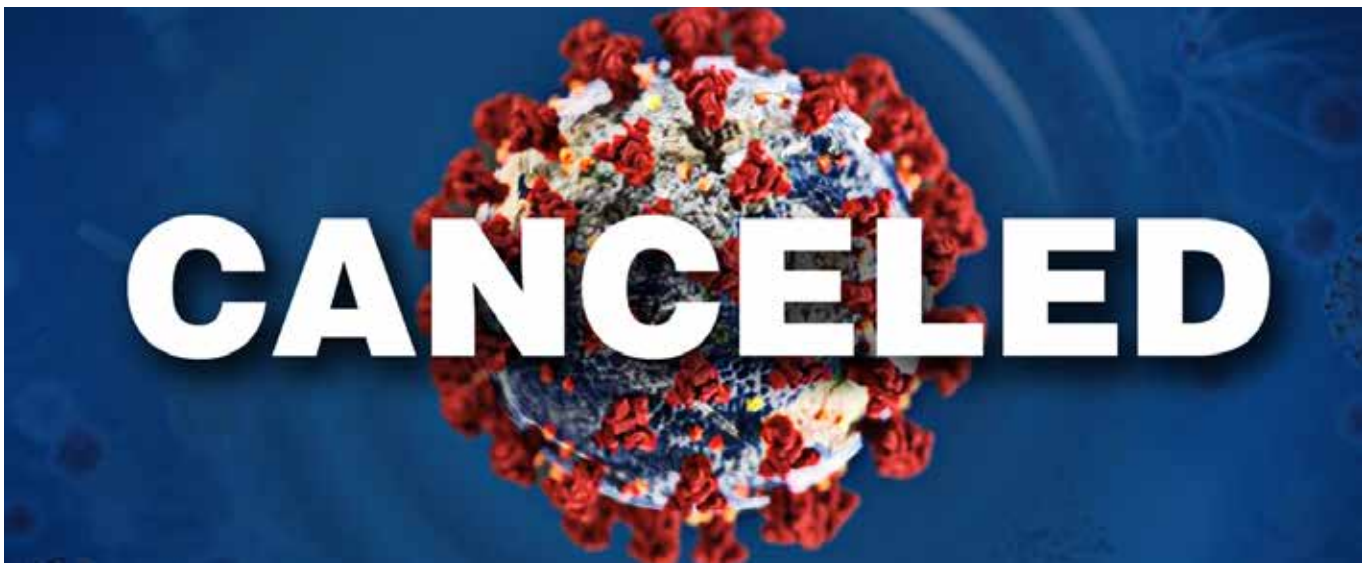
Academy of Osseointegration cancels meeting in light of COVID-19 world pandemic



Author_ Sierra Rendon, Managing Editor

_In a letter to its members and to the press sent out on March 5, the Academy of Osseointegration canceled its 2020 annual meeting previously scheduled for March 18-21 in Seattle.

The statement from AO President Jay P. Malmquist, DMD, stated: "After careful consideration of the ongoing spread of COVID-19 (coronavirus) overseas, and in the United States, the AO Board of Directors decided not to conduct (the annual meeting).

"AO has been monitoring the coronavirus situation with the health, safety and well-being of our guests in mind. The AO Board of Directors arrived at this difficult decision after consulting with speakers, vendors, exhibitors and other meeting participants, and gathering information from the Centers for Disease Control and Prevention, the Washington State Department of Health, the King County Department of Public Health and other public health authorities."

Clinicians who had planned to attend any of these meetings are urged to cancel flight and hotel reservations as soon as possible.

"AO 2020 Annual Meeting registration fees will be fully refunded," the statement added. Attendees should expect to receive an email confirming a refund has been processed by the end of March.

"Ultimately, the global nature of our meeting, rapidly escalating health concerns regarding the coronavirus, and ongoing travel and other restrictions made it impossible for us to hold the meeting at this time," Malmquist said.

Subsequently, shortly after the AO made its announcement, the Hinman Dental Meeting, the American Association of Endodontists, the American Academy of Cosmetic Dentistry and the American Association of Orthodontists all made similar announcements regarding the cancellation of meetings scheduled for spring 2020.

At this time, the COVID-19 pandemic, and its consequences, is changing on a day-by-day basis, so if you have other dental meetings on your schedule for the remainder of the year, Dental Tribune recommends you frequently check its website, *www.dental-tribune.com*, as well as seek us out on Facebook and Instagram, for the latest updates and statements regarding upcoming dental meetings._

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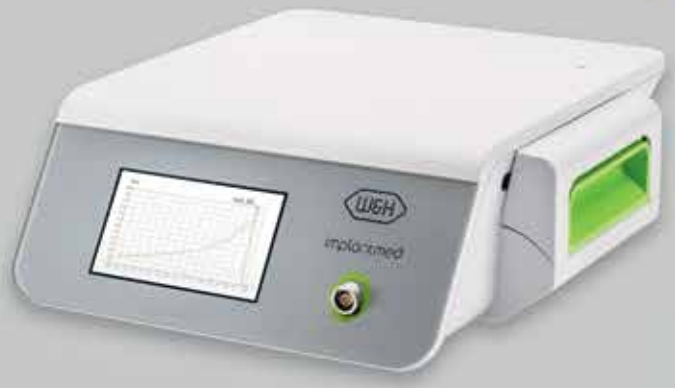

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Designs for Visions' big 'Reveal' may also be its most groundbreaking

Author_ Designs for Vision Staff

_Designs for Vision has announced the introduction of its groundbreaking Reveal™ (U.S. pat. 10215977B1). Reveal provides hands-free fluorescence-enhanced theragnosis™ (FET™), combining diagnosis and fluorescence-enhanced therapy.

Reveal supplies the visual information to support decision making and facilitate proper treatment options in cariology, oral hygiene, periodontology-implantology and restorative dentistry.

Utilizing endogenous fluorescence of teeth and certain bacteria, Reveal identifies enamel demineralization and bacterial contamination, allowing as well for differentiation between infected and affected dentin, according to the company. Reveal allows for guided caries removal, preserving more tooth structure and avoiding postoperative complications.

Designs for Vision asserts that Reveal illuminates during prophylaxis, supporting detection of supra and subgingival infected calculus. Additionally, Reveal identifies the accumulation of perioactive bacteria, allowing for the identification and early treatment. Reveal also easily distinguishes between tooth structure and dental restorations, according to the company.

The Reveal headlight produces wavelengths of light that stimulate structures; these excited structures emit light in a longer wavelength. This is known as the Stokes shift. The Reveal loupes utilize special filters that both enhance the emitted fluoresced light and protect the clinician from any damaging wavelengths, Designs for Vision states.

For more information, contact Designs for Vision to arrange a visit in your office at (800) 345-4009 or *info@dvimail.com.*

(Photo/Provided by Designs for Vision)

'The Reveal loupes utilize special filters that both enhance the emitted fluoresced light and protect the clinician from any damaging wavelengths.'

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Navident 2 streamlines, simplifies workflow with navigation guidance

Author_ ClaroNav Staff

_Similar to the way in which a GPS system guides a driver, Navident by ClaroNav guides clinicians by using the CBCT image as a map. It offers surgeons an easy-to-use, accurate, highly portable and affordable means of planning restorations and implant placements, according to the company.

With Navident 2, clinicians will no longer need to do a special, extra scan. They can use the diagnostic scan already available for the patient. The stress of stent making is also gone because a stent is no longer required.

Trace and Place (TaP) is a game-changing development for dynamic navigation, the company asserts. With TaP, the Navident workflow is streamlined, efficient, user-friendly and seamlessly integrated into the daily practice.

"Trace and Place is a real tipping point for dynamic navigation guidance," said user Dr. George Mandelaris, a periodontist from Chicago. "It has streamlined and simplified the workflow in both the diagnostic and surgical phases to allow state-of-the-art technology to be an everyday component of my surgical implant practice. I cannot imagine going back."

Implantology specialists who have used Navident 2.0 have said they have experienced negligible operator stress, improved time efficiency and an increase in patient acceptance, according to the company. The accuracy offered by the new version, combined with the need for minimal tissue manipulation, is conducive to a shorter and better recovery process for patients, the company asserts._

(Photo/Provided by ClaroNav)

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U.S. Headquarters
Tribune America
118-35 Queens Blvd., Ste. 400
Forest Hills, NY 11375
Tel.: (212) 244-7181
Fax: (212) 244-7185
feedback@dental-tribune.com
www.dental-tribune.com

Publisher
Torsten R. Oemus
t.oemus@dental-tribune.com

President/ Chief Executive Officer
Eric Seid
e.seid@dental-tribune.com

Group Editor
Kristine Colker
k.colker@dental-tribune.com

implants Managing Editor
Sierra Rendon
s.rendon@dental-tribune.com

Managing Editor
Fred Michmershuizen
f.michmershuizen@dental-tribune.com

Managing Editor
Robert Selleck
r.selleck@dental-tribune.com

Client Relations Manager
Lee Colquhoun
l.colquhoun@dental-tribune.com

Product/Account Manager
Humberto Estrada
h.estrada@dental-tribune.com

Product/Account Manager
Jordan McCumbee
j.mccumbee@dental-tribune.com

Product/Account Manager
Maria Kaiser
m.kaiser@dental-tribune.com

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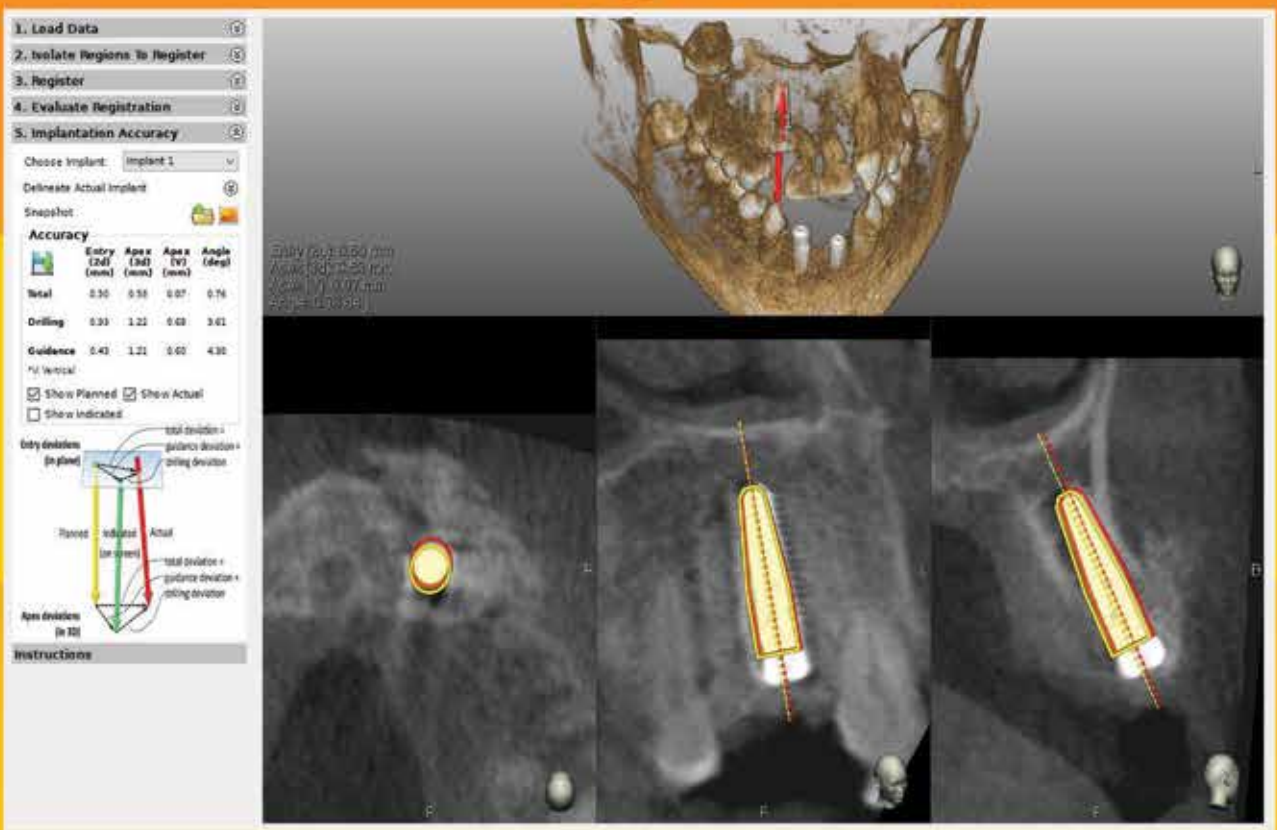

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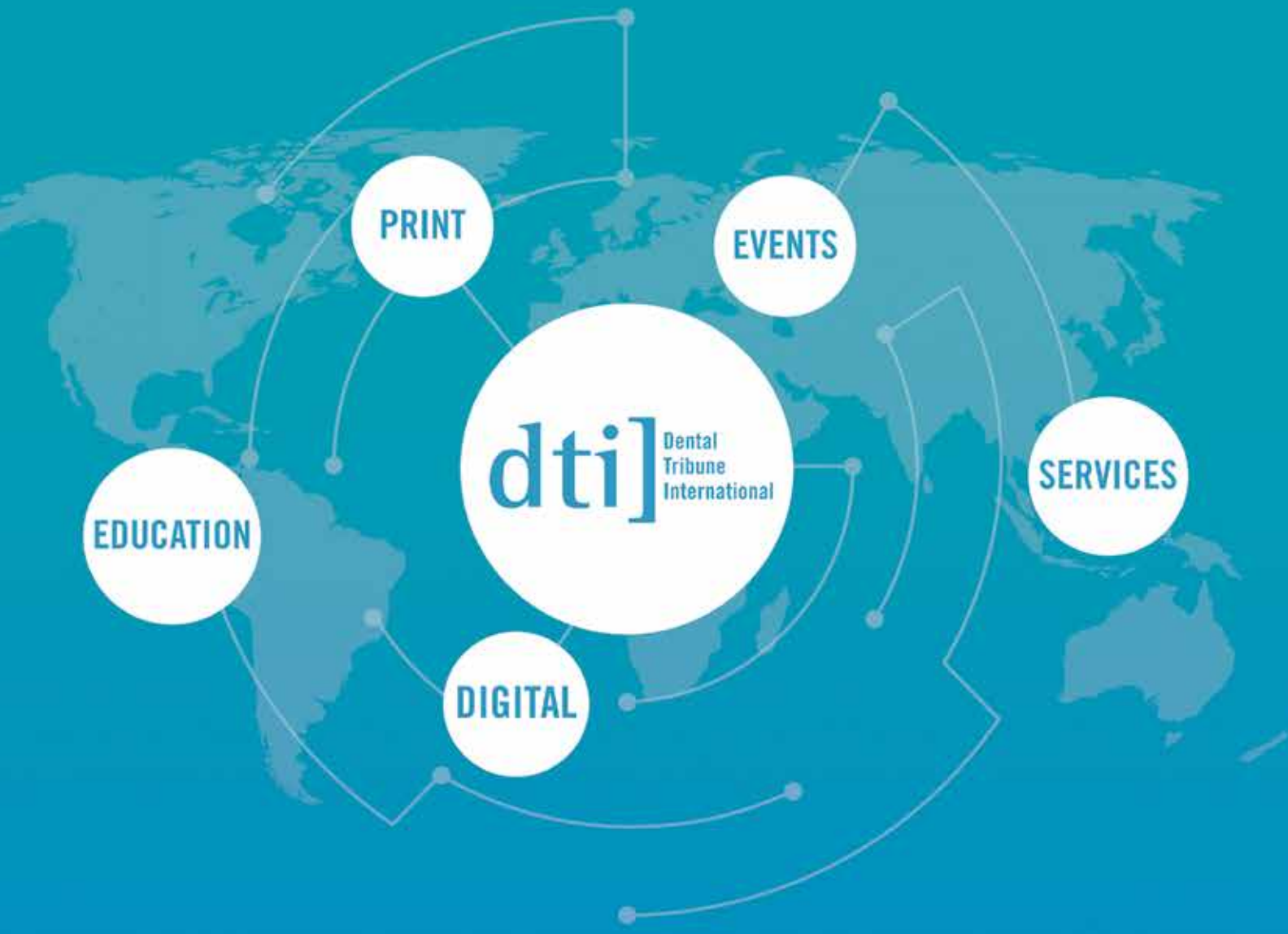

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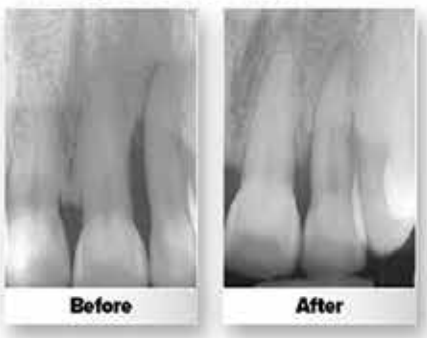

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