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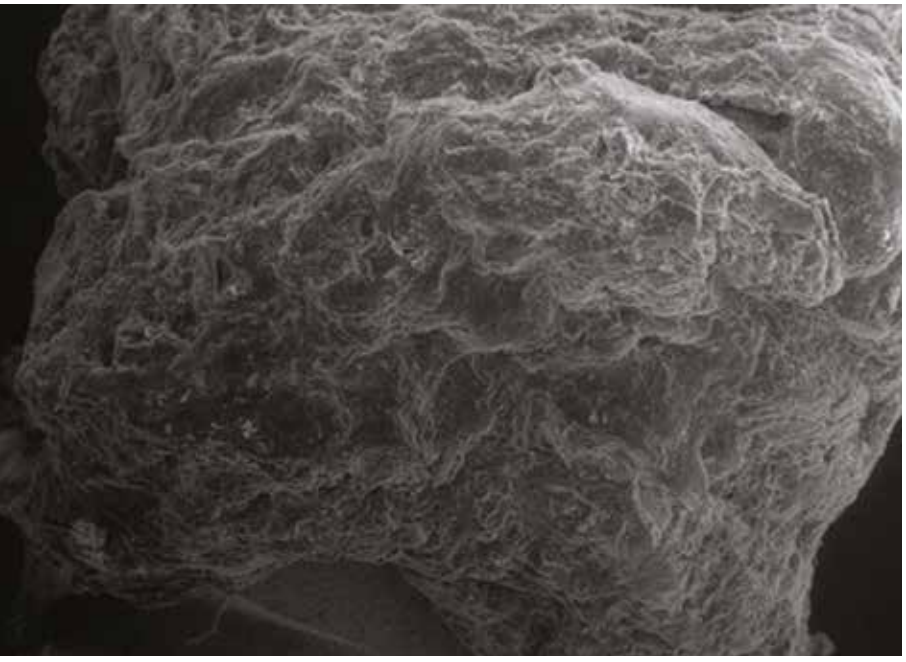

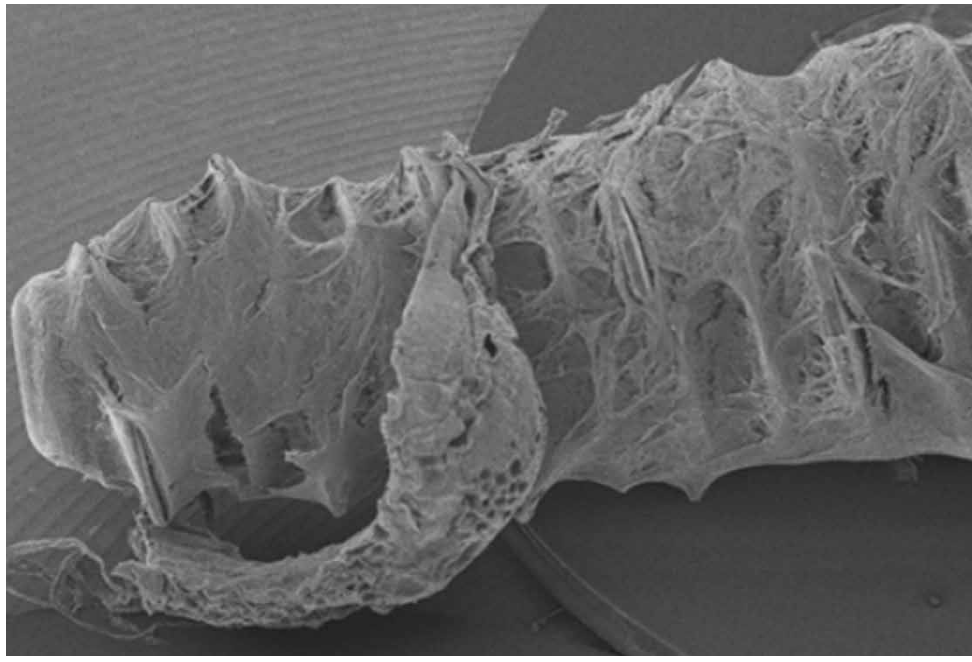

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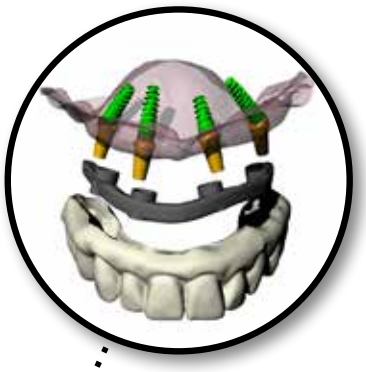

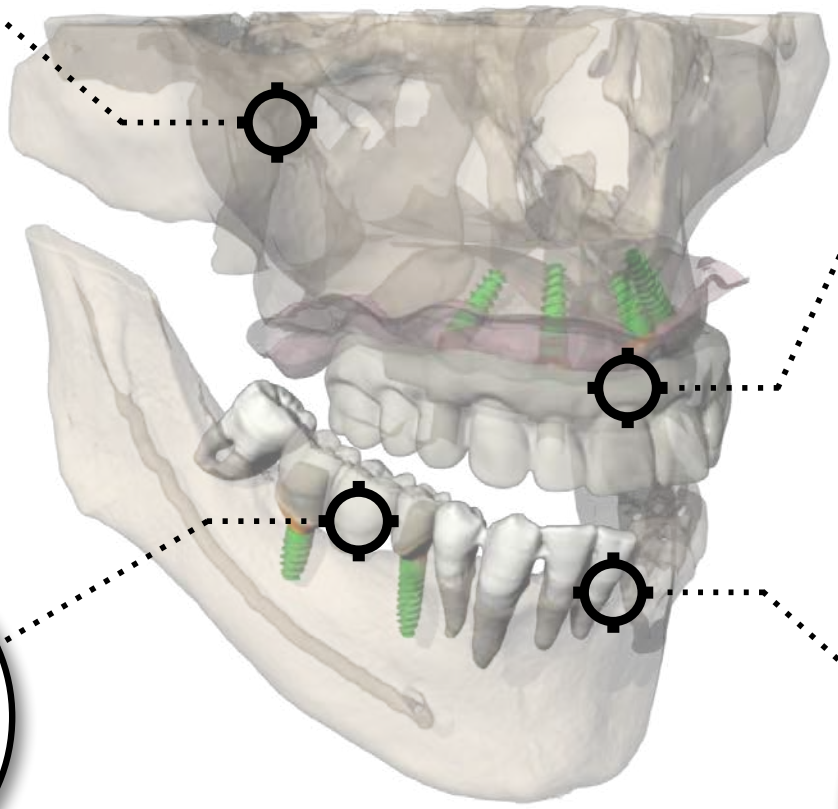

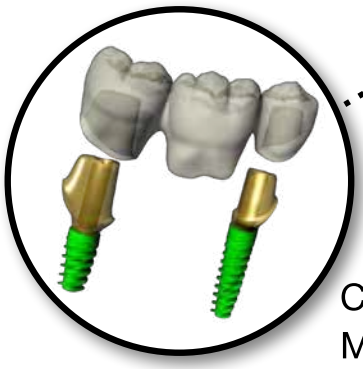

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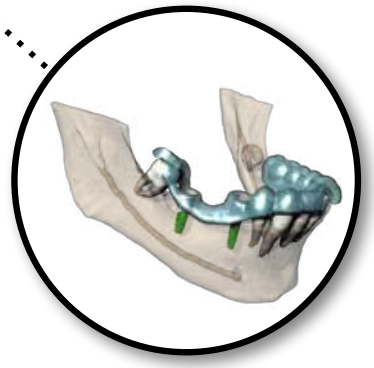

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OSTEO-CARE PROJECT

Dental prosthetic devices osseointegration improvement by the permeation of autologous growth factors of the implant surface

Release of VEGF from Dental Implant Surface (IML® Implant) Coated with Concentrated Growth Factors (CGF) and the Liquid Phase of CGF (LPCGF): In Vitro Results and Future Expectations

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Abstract: This study aimed to evaluate the combined use of the Concentrated Growth Factor (CGF) and the liquid phase of CGF (LPCGF) on dental implant surfaces, using a medical device to determine the migration of growth factors, from the implant surface to the recipient. The implants were permeated by autologous growth factors, using a specific centrifuge device. CGF adhesion on the implant surface was evaluated through a scanning electron microscope analysis. To assess the release of the vascular endothelial growth factor (VEGF) from CGF, LPCGF, and CGF- or LPCGF-permeated implant, an ELISA assay was carried out. The results showed that the concentration of the growth factor VEGF was greater in CGF than in LPCGF. Our innovative technique allowed the incorporation of autologous growth factors on the surface of the dental implants. Moreover, we reported the release of VEGF, over time, by CGF- or LPCGF-permeated implant. On this basis, it was possible to obtain a biologically active implant surface, essential to create intercellular communication and neo-angiogenesis, to facilitate wound healing and tissue regeneration.

Keywords: *bilateral osseointegration; growth factor; dental implant*

1. Introduction

Implant osseointegration is a concept that now enjoys wide support. In 1999, Alberktsson and Zarb defined osseointegration from the clinical standpoint as a rigid and clinically asymptomatic fixation process of an alloplastic material, in bone loaded functionally [1]. The most important aspects for successful osseointegration are the biological characteristics of the host site (the patient) and the macro- and micro-structure of the titanium implant [1,2]. Dental implant surfaces have now achieved outstanding performances, which were previously unimaginable. This ensures an extremely high percentage of osseointegration, even in the most complex situations [3]. However, this meant that the margins for the further improvement of modern surfaces, through mechanical or chemical procedures, are very small. Improvement can be achieved biologically, although, through the addition of autologous growth factors, obtained by processing the patient's venous blood to the implant surface.

The study on tissue reparative processes has highlighted the fundamental role played by platelets (in this context), which are physiological reservoirs of growth factors and proteins. There are various platelet concentrates, such as platelet-rich plasma (PRP), platelet-rich fibrin (PRF), and concentrated growth factor (CGF), which reconstruct bone defects [2]. Numerous studies have shown that PRF provides positive results in tissue engineering [4]. A research by Sohn et al. has demonstrated the greater regeneration capacity of the CGF and its multi-purpose use [5]. After a long phase of study, our therapeutic choice was the use of the CGF, for the following reasons. It is 100% autologous and biocompatible, requires a simple preparation, is easily identifiable, has a very high concentration of platelets in a fibrin network, has a presence of growth factors and no manipulation of the product is necessary when exclusively using autologous blood products, without the addition of other substances. Platelets, in particular, contain biologically active proteins at high concentrations and support cell healing, growth, and morphogenesis [6]. In addition to platelets, CGF contains fibroblasts, leukocytes, and endothelial cells for angiogenesis and tissue remodeling; and provides a matrix for cell migration [7,8]. CGF is a fibrin biomaterial rich in the growth factors obtained by centrifugation of venous blood, at alternating speeds, as set on the Silfradent device [8].
CGF, associated with guided bone regeneration, has been used to accelerate new bone formation. Due to its special characteristics, including lack of immune reaction, capability of accelerating tissue healing and vascularization, and anti-swelling properties, CGF is widely used in implant surgery [9–11]. However, the interaction between CGF and dental implant is not clear. The addition of autologous growth factors to the implant surface is hindered by titanium's characteristics of extremely low wettability [12]. This means that to simply wet the implant with autologous growth factors is of little use, unless it is left in immersion for more than 30 min [13]. This makes the procedure difficult to include in the clinical routine. In view of these difficulties, the challenge of producing a biologically active surface still remains. The present study reports a protocol that could produce a biologically active implant surface. The growth factors are incorporated onto the implant surface, using a dedicated implant ampoule, which enables the procedure to be carried out in a closed field. A centrifuge device (Round up) made by a Silfradent related to the ampoule enables autologous fibrin and growth factors to be incorporated onto the implant surface, within five seconds. We verified the adhesion of CGF on the titanium implant surface and then quantified the release of the vascular endothelial growth factor (VEGF) from CGF, the liquid phase of CGF (LPCGF), and CGF- or LPCGF-permeated implants.

2. Materials and Methods 2.1.

Preparation of CGF and LPCGF Blood samples (8 mL) were taken by puncture of a vein from five donor patients, non-smokers, and those in good general health. The five donors involved in the study (three men and two women) were aged between 25 and 45 years, with a BMI (Body Mass Index) between 21 and 23 points. The remote and pathological anamnesis were negative. Patients were not on therapy with any type of drug and the blood samples were taken separate from the main meals, on empty stomach. Informed consent was obtained from the patients included in this study. Tubes of blood were processed by a device (Medifuge MF200; Silfradent srl, Forlì, Italy) to obtain CGF, following the manufacturer's instructions. The resulting CGF was then inserted into dedicated implant ampoules (Figure 1), so that the coating procedure could be carried out in a closed field; each contained an implant (Immediateload®, Swiss dental implants, diameter 4 mm and height 8 mm). To incorporate the CGF onto the implant surface, these tubes were inserted into a second device, Round Up (Silfradent srl, Forlì, Italy), and centrifuged for 5 seconds, following the manufacturer's instructions (Figure 2).

Evaluation of the quality of the CGF was done on two fractions—the so-called white fraction and the red fraction.

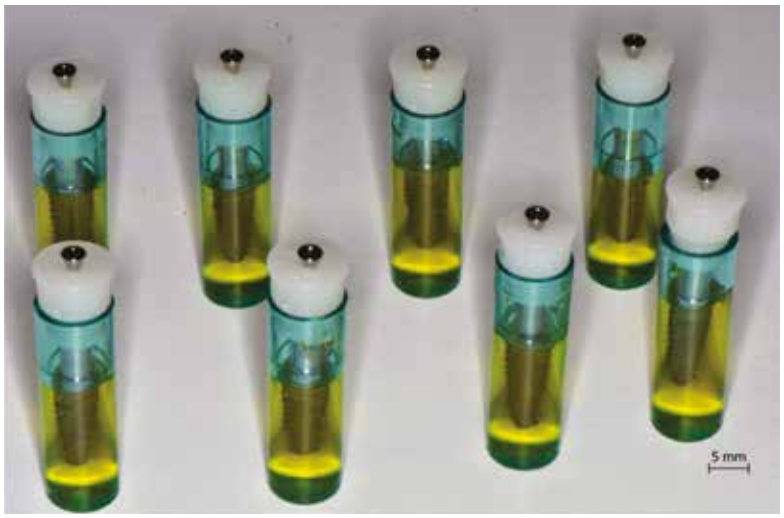

Figure 1. Concentrated Growth Factor (CGF) isolation after using the Silfradent device (Medifuge MF200; Silfradent srl, Forlì, Italy).

Figure 2. Centrifugation of the test tubes with Immediateload implants along with CGF or the Liquid Phase of CGF (LPCGF) by Round Up (Silfradent srl, Forlì, Italy).

The white cup-tubes allowed the obtainment of a fraction, known as LPCGF (liquid phase of CGF), that comprised non-polymerized liquid fibrin. It was isolated by placing the centrifuged blood in a test tube, with a white lid; this was completely smooth within and contained no additives. It produced the material in a liquid state; this would polymerize at room temperature (RT), over the subsequent 15 min. The red cup-tubes allowed the obtainment of a fraction, known as CGF polymerized fibrin, which was isolated using a test tube with a red lid and textured inner walls, to promote polymerization, through an exclusively physical process. The resulting fraction had a thicker consistency than the fraction obtained by the white cup-tube, a gelatinous appearance, and a higher cell concentration of the non-polymerized fibrin.

2.2. SEM Analysis

The CGF-permeated implant was fixed in 2.5% glutaraldehyde for 2 h at RT. The specimen was fixed with 1% osmium tetroxide for ~2–4 h, and then dehydrated with a graded ethanol series (from 50% to 100%, in steps of about 20%, for 10 min each). After dehydration, the SEM preparation procedure was completed by critically drying the material. The analysis was performed by means of ZEISS EVO 40 (Carl Zeiss, Milano, Italy)) in a low vacuum modality and by applying a voltage of 25 kV. The sample was placed on the SEM sample holder, using double-sided adhesive tape, and was observed without any further manipulation, at a lower and higher magnification (50× and 1000×) [14].

2.3. ELISA Assay

LPCGF (white fraction) and CGF (red fraction), or implants plus CGF/LPCGF, immediately after the preparation, were transferred to the wells containing phosphate buffer saline (PBS, Sigma Aldrich, Milan, Italy). The supernatants were collected at time 0, and after 1, 2, and 3 days. VEGF concentrations in the media were determined by using ELISA and following the manufacturer's protocols (R&D Systems, Minneapolis, MN, USA). In brief, 100 µl of the culture supernatant was added to each ELISA well, pre-coated with anti-human VEGF polyclonal antibody. After 2 h of incubation at room temperature, the plate was washed and 100 µl of human VEGF conjugate was added to each well. The plate was incubated at RT for 1 h, washed again, and 100 µl of the substrate solution was added to each well. The plate was then incubated at RT, in the dark, for color development. After 30 min, 100 µl of stop solution was added to each well. Absorbance in each well was measured by using a microplate reader at 450 nm. The concentration of VEGF in the culture supernatant was determined through interpolation from the standard curve.

2.4. Statistical Analysis

Data were expressed as mean ±SD. Statistical analysis was determined by paired Student's t-test. In all comparisons, $p < 0.05$ was considered as statistically significant.

3. Results and Discussion

CGF is constituted by a fibrin network that includes many cellular components, such as stem cells and growth factors [8,15]. The CGF exerted its effects through the degranulation of the platelet granules, which contained various growth factors that are considered important in the initial phase of wound healing. This resulted in an increase in cell proliferation and differentiation, matrix formation, osteoid tissue production, connective tissue formation, angiogenesis, and collagen synthesis. The degranulation process began immediately after platelet aggregation and lasted about 7–8 days. This affected the macrophage cells that continued the repair process. The wound healing rate was directly proportional to the quality of platelet concentration in the clot, inside the graft. In the present study, we obtained two different concentrated growth factors, named CGF and LPCGF, and we analyzed the release of the growth factor VEGF, from both preparations incubated in PBS, for up to three days, as shown in Figure 3. The results showed that both preparations of CGF and LPCGF released VEGF, the concentration of VEGF was higher in CGF than in LPCGF, by about five times, at time 0 (Figure 3).

However, the VEGF release from the CGF drastically decreased by about 78% and 93%, after the first and second day, respectively, compared with time 0 (Figure 3). The VEGF release was also reduced in LPCGF by about 43% after the first day, and was further lowered on the second day, reaching levels comparable to the VEGF release from the CGF (Figure 3). Our results expand on the previous findings regarding the release of VEGF by CGF [15].

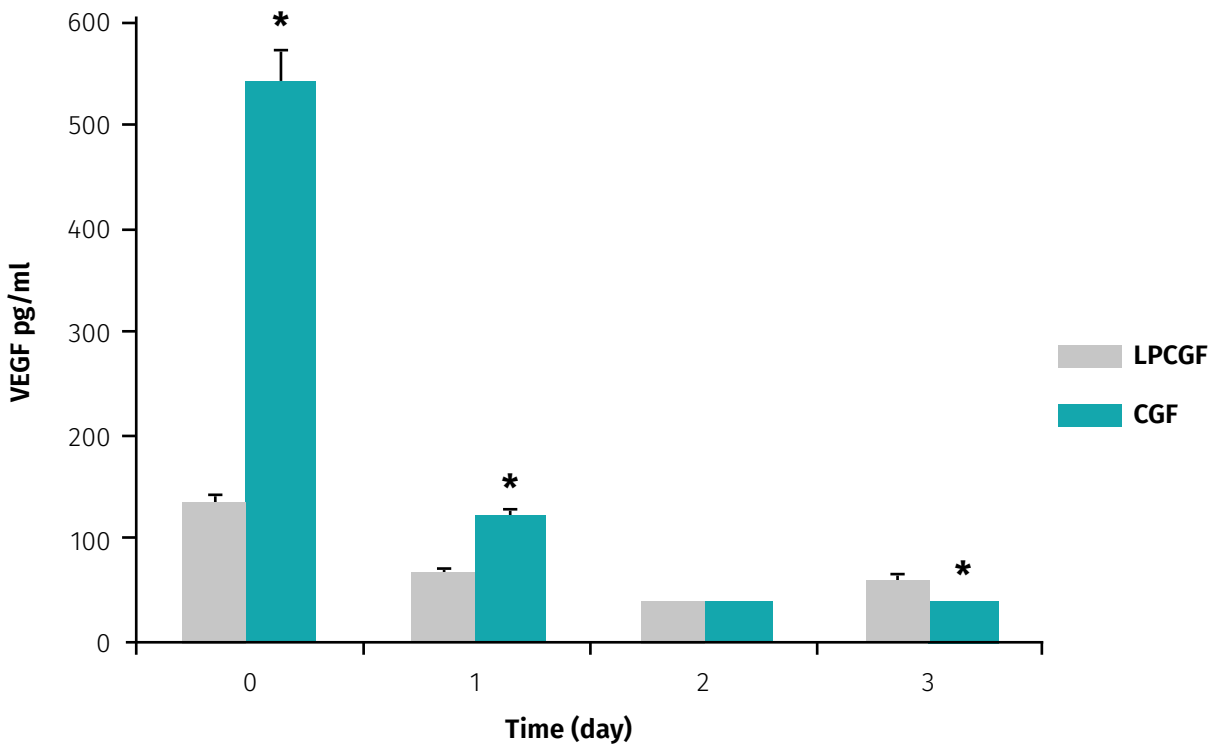

Figure 3. ELISA quantification of human vascular endothelial growth factor (VEGF) into phosphate buffer saline (PBS) from CGF and LPCGF at various times (0–3 days). Values are means ± SD, n = 3. *$p < 0.05$ denotes the statistically significant differences between VEGF released by CGF or LPCGF.

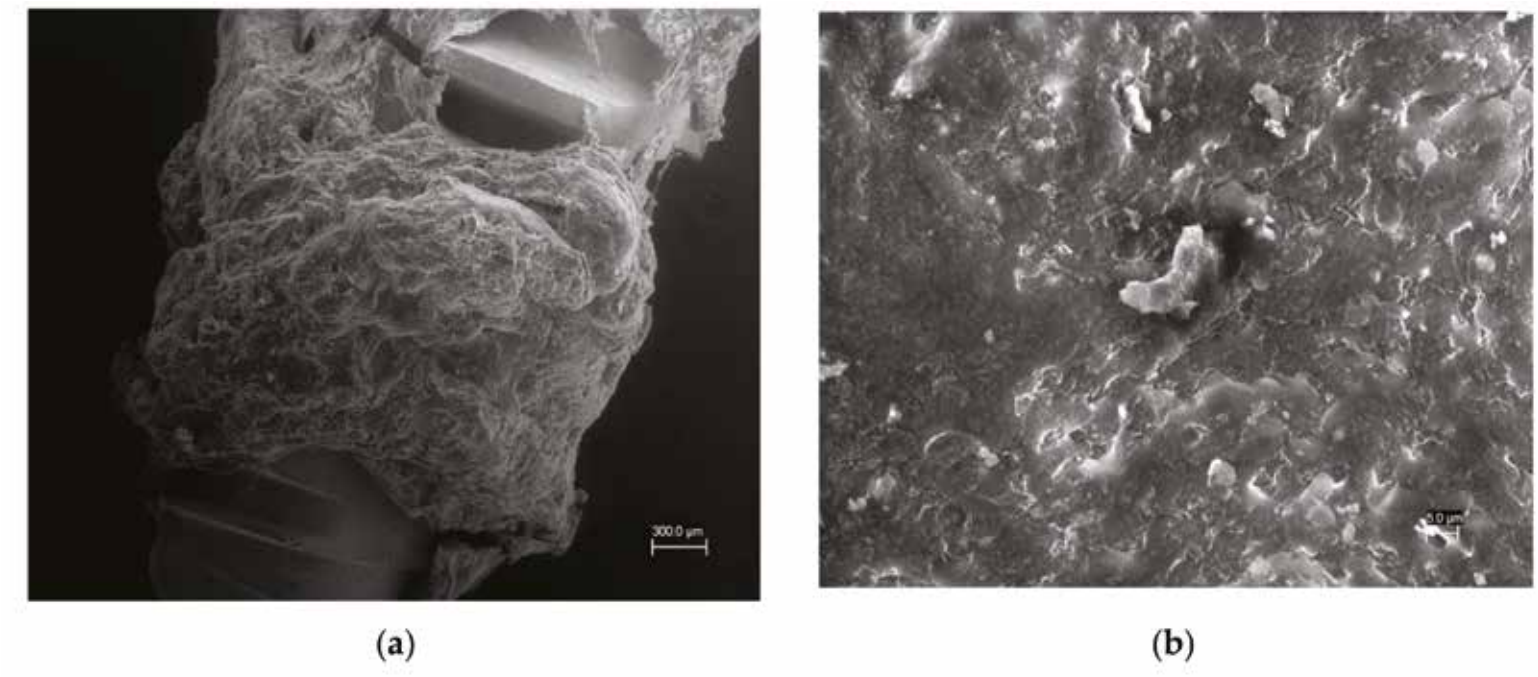

Figure 4. (a) SEM photomicrograph of the CGF-permeated implant. (b) Large magnified image of the CGF-permeated implant detail.

By using an innovative device, we evaluated the potential incorporation of CGF on the surface of the titanium implant. We verified the interaction between the CGF and the titanium implant surface, by SEM analysis, revealing that the CGF actually permeated the surface of the implant (Figure 4). Having shown that, in our experimental conditions the CGF was able to adhere to the implanted surface forming a fibrin network, we evaluated whether the CGF-permeated implant also allowed the release of growth factors, in particular VEGF, from the implant towards the medium—PBS.

As shown in Figure 5, the implants permeated with CGF or LPCGF were able to release VEGF in PBS medium. At time 0, in the permeated implant, as well as in the system without implants, the concentration of VEGF was five times higher in CGF than in LPCGF. However, contrary to the CGF or LPCGF without implants, VEGF released from the CGF or the LPCGF-permeated implant, increased on time. In particular, the VEGF levels from the LPCGF-permeated implant increased in a time-dependent manner, until the second day and then remained constant.

The time course in Figure 5 also shows that the VEGF released from the CGF-permeated implant was significantly raised on the first day, by about 70%, remained almost constant on the second day, and was then lowered by about 15% on the third day (Figure 5). To the best of our knowledge, our study provided, for the first time, results concerning the incorporation of autologous growth factors on dental implants, and the associated release of VEGF over time. It is important to emphasize that the use of specific implants was crucial for a better implant micro-surface that enabled the growth factors to settle on the inner surface. The surface of the Immediateload implant was specifically designed to be coated by the patient's CGF, while presenting excellent characteristics of osseointegration, in

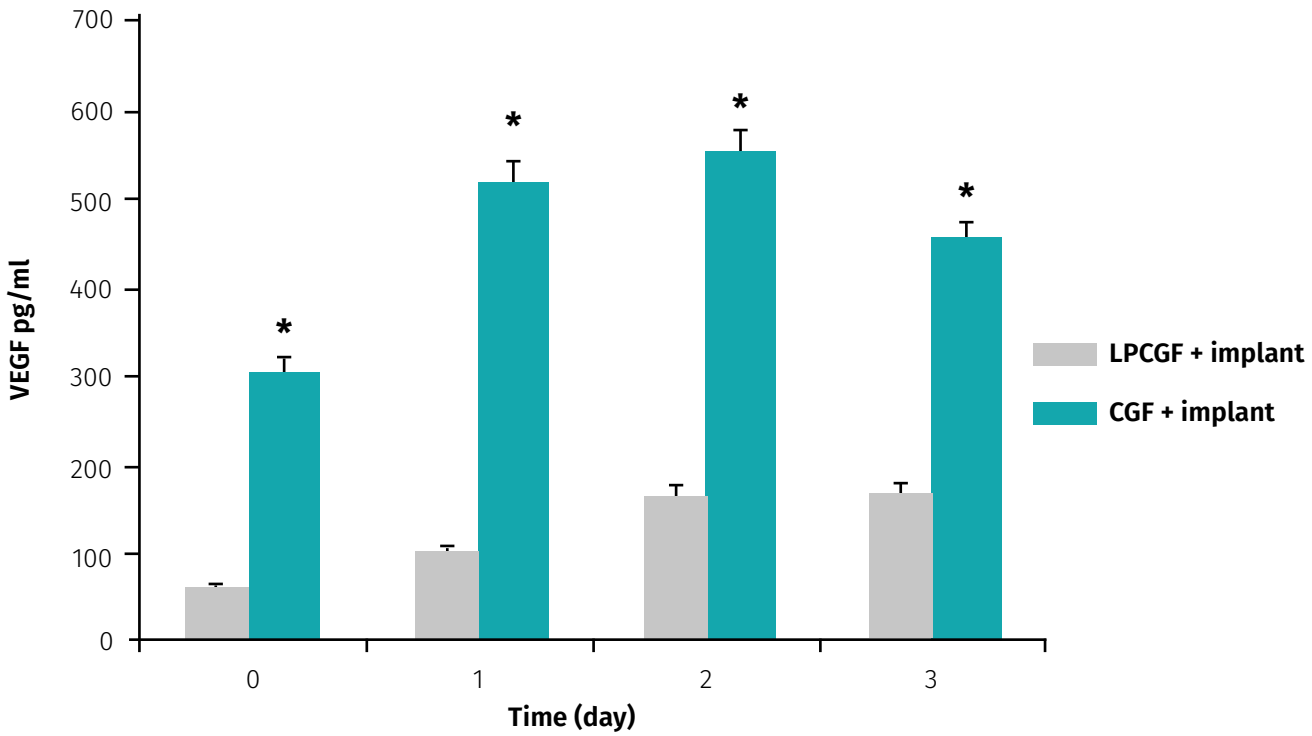

Figure 5. ELISA quantification of human VEGF into PBS from CGF- and LPCGF-permeated implants at various times (0–3 days). Values are means ± SD, n = 3. *p < 0.05 denotes statistically significant differences between the VEGF released by CGF- and LPCGF-permeated implants.

the absence of CGF. From a practical standpoint, a coating with LPCGF could be achieved through a closed system created for the direct addition of LPCGF, within the implant tube, using needles. The procedure is easily reproducible in an outpatient setting, thanks to the dedicated implant tubes. However, when using CGF, although its concentration of VEGF at time zero was much higher than that in LPCGF, it entailed the opening of the tube for inserting the CGF, and its closure, before centrifugation. However, this last procedure (the opening of the tube and the addition of the CGF) took place in an open system, but with a contiguity of time and space that did not limit its clinical application. From a clinical point of view, it would be very important and interesting to evaluate if a slow and gradual release of VEGF by LPCG, over time, would be more effective, than a quick release of VEGF by CGF. In fact, the presence of VEGF on the implant surface was crucial, since this growth factor could improve the osseointegration of the dental implant [16].

Incorporation of the CGF/ LPCGF on the surface of the titanium implant could be carried out in private practice, but always according to the national laws of a country, which might be different from one country to another. The organization should first obtain all necessary authorizations for medical and surgical practice.

4. Conclusions

The results reported here showed that a titanium dental implant surface, permeated with CGF or LPCGF, contained fibrin, which is fundamental to accommodate the cellular network. The permeated dental implant surface was found to slowly release VEGF, a growth factor indispensable in creating intercellular communication and neo-angiogenesis, during bone regeneration and healing [17–19]. The devices used in this study could be employed to produce the first biologically active implant surface, permeated

with both fibrin (which is essential to accommodate the cellular network) and growth factors (which are essential to create intercellular communication and neo-angiogenesis).
By using this procedure, the osseointegration process becomes bilateral, operating both from the bone towards the implant, and from the implant towards the bone. This could reduce healing time and potentiate the physiological response. It will, thus, become possible to expand the application of this type of surface in other fields of medicine, including orthopedics, maxillofacial surgery, and plastic surgery. Further studies are needed to investigate the use of biologically active surfaces, in greater depth, and to further improve the implant micro-surfaces, making them increasingly permeated by the autologous growth factors.

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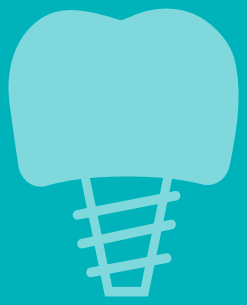

DENTAL IMPLANTS

BTI Biotechnology Institute

Leader in innovation in oral implantology and regenerative medicine

BTI Biotechnology Institute is a Spanish multinational, founded in 1999 and specializes in biomedicine and biotechnology, whose activity focuses on: **Regenerative medicine and Oral implantology.**

Thanks to its commitment to **research and R&D**, BTI is today one of the companies of reference at an international level in the area of implantology and oral rehabilitation, offering a **wide range of clinical solutions in a way that the dental professionals can address their treatment with the utmost confidence and predictability.** The intensive research work of BTI is reflected in the publication of more than 200 scientific articles in the most prestigious journals with the greatest impact worldwide.

BTI range is one of the most complete in the market, covering technologies, concepts and products that can respond to all the needs of the dental practice, from surgical planning using the **BTI Scan4** software to surgery, by means of the **versatile system of implants** and, of course, the restoration through prosthetic components with a **great precision in the machining** and CAD CAM systems.

Thanks to recent advances in research, the BTI system of implants has a **surface of unique characteristics**: topography of triple roughness modified with **free calcium ions**, which enables the adhesion and activation of platelets instantaneously during the moment of implantation, inducing the regeneration process to start immediately. This implies a quicker regeneration process, with a **lower risk of peri-implantitis**, thanks to the biological seal against the bacterial attacks provided by this surface. It should be noted that the range of BTI implants was **the first to receive the seal of the CleanImplant Foundation**, which certifies the quality of the materials and the purity of the implant surface.

For the treatment of transverse and vertical bone defects, BTI introduces simplified protocols with the use of implant of reduced diameter and length, as well as an **autologous regeneration technology : Endoret® - PRGF®**, to resolve the limitations that may have re-absorbed bones.

Endoret® - PRGF® technology is the most advanced autologous system in Platelet Rich Plasma, whereby, from a minimum volume of blood from the patient, it is possible to isolate and concentrate the growth factors and other proteins responsible for the repair and regeneration of tissues for therapeutic use. Thus, the application of Endoret® - PRGF® allows to stimulate, accelerate and improve the repair process of damaged tissues in an injury.

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Geass is the Italian company, focusing on dental implantology since 35 years. R&D, collaboration with universities, relations with professionals and the excellence of the Geass manufacturing plant guarantee innovative, reliable and safe solutions.

Several types of implant, specific for every kind of rehabilitation, are the perfect solution to answer all the professional's needs. Synthegra is the patented laser surface treatment, which fights peri-implantitis and promotes osseointegration.

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Join our worldwide distributors

Bionnovation is a Brazilian company specialized in Dental Implants & Biomaterials. Our products, services and training available in over 40 countries with more than 15 years of experience and research. This year the Bionnovation are introducing a stream of new products and solutions, whose availability in some markets is subject to regulatory approvals.
SWE Implant and an innovative tent screw, called Tent Screw DM. The main advantages of tent pole technique are stable gains in vertical alveolar bone height, successful retention of implant prosthesis associated with the procedure.

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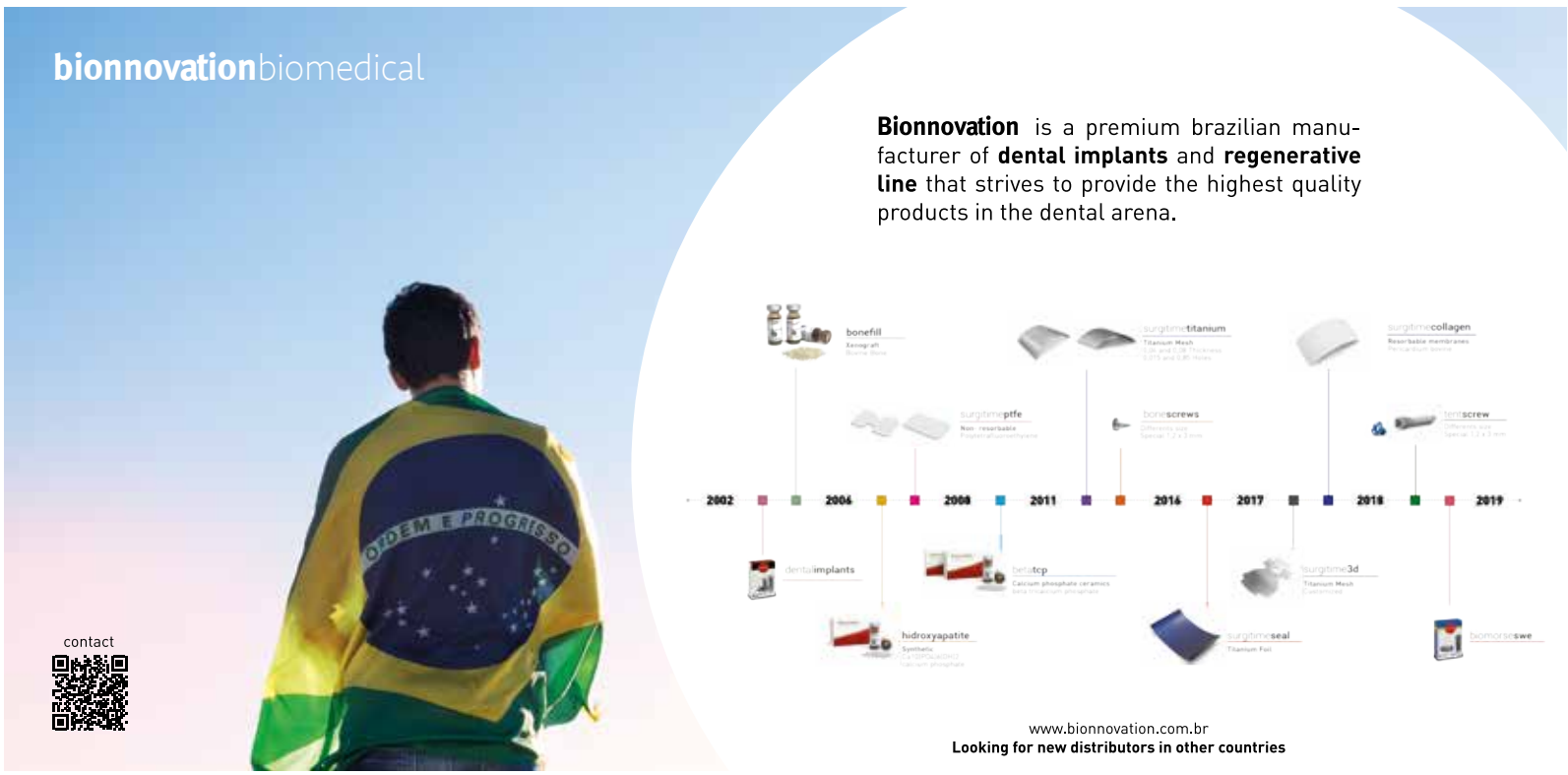

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• C-Tech Implant

SD/MB C-Tech Mini Implants

As the leading manufacturer of Mini Implants in Europe C-Tech offers the largest range in the category with 2 mini implant lines, SD (Small Diameter) and MB (MonoBlock).

The SD line with diameters that go from ∅ 1.8 to ∅ 2.5 and the MB the ∅ 3 line, present different threading profiles for the use in hard or soft bone, distinctive collar heights to better address the different gingival thickness and o-ball or square head for removable or fixed prosthetic solutions.

This 2 implant systems are ideal for the practitioner who is looking for minimally invasive solutions for stabilizing over-dentures, limited spaces and bone volumes as well as treatment cost constraints.

www.c-tech-implant.com // info@c-tech-implant.com

• C-Tech Implant

Esthetic Line Implant

Everything about this implant is aimed at maintaining crestal bone and gingival volume. From the bevelled shoulder, micro-threaded collar to the aggressive apical threading, this subcrestally placed implant achieves an excellent primary stability and is ideal for post extractive and immediately loading cases. The name of this implant speaks for itself, the “esthetic” is the main goal when using this implant.

Manufacturer: C-Tech Implant Srl

Morphology: cone-morse with internal hexagon. EXTERNAL SHAPE: 3 Different threading profiles with aggressive apical design and rounded apex.

Surface: Grit blasted and Acid Etched surface

Available Implant Lengths (mm): 7 / 8 / 9 / 11 / 13 / 15

Available Implant Diameters (mm): Narrow: 3.1 Regular: 3.5 / 4.3 / 5.1 / 6.0 / 7.0

Seating Position To The Bone Crest: 1 mm under the bone crest to allow platform switching

Abutment-Implant Connection Type: Hexagonal, Cone Morse Conical Connection

Index type abutment repositioning: Hexagon

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• Dental Tech

Shape Tissue Effect

Dental Tech has expanded its wide range of products with a new prosthetic component that promotes the conditioning of peri-implant tissues. It is applied at the same time as the surgical phase of implant placement, maintaining freedom of flexibility during the prosthetic phases. The transmucosal abutment radically simplifies the prosthetic procedure, since it moves the engagement platform of the external connection implants from the bone level to the soft tissue level.

It can be prostheticized both in immediate loading, in a variety of secondary components suitable for the planned prosthetic project, and in deferred loading, preserved by a protective cap that leaves the soft tissue undisturbed to optimize healing and complete implant integration.

The abutment's external connection platform offers a wide range of prosthetic solutions to better manage the prosthetic needs of each project.

Once positioned according to the prosthetic emergency, it is no longer removed, guaranteeing the stability of the surrounding peri-implant tissues. Acting on the transmucosal abutment with a Torque of 30Ncm, perfect matching between the abutment-implant interface is ensured, thus preventing the migration and bacterial colonization on the "pumping effect" action.

The abutment is available for FTP, ImpLogic® and ImpLassic implant connections, in different types of transmucosal height.

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info@dental-tech.it // www.dentaltechitalia.com

• Dental Tech

Restyling of the ImpLassic HX3 Implant Line

Development and growth are two concepts that have always characterized Dental Tech's professional history. The recent modernization and innovation of the Dental Tech manufacturing plant involved important changes also in terms of product, such as the Restyling implemented on the ImpLassic HX3 Implant line.
Compared to the previous ImpLassic HX2, the morphology of the implant has been revised in order to give greater primary stability of the coils. The main features of the ImpLassic HX3 can be summarized as follows:
· Implant with cylindrical body and conical apex.
· Possibility of modulating the surgical procedure according to the bone features of the clinical case.
· Suitable to all bone types and even in the case of non-compact bone it is able to achieve a good primary stability.
· Dedicated implant insertion driver that does not affect the Implant-Prosthetic connection.
· Universal hexagon external connection, with 4.1 platform and 2.7 hexagon, suitable for any type of prosthetic reconstruction, both screwed and cemented.
· The geometry of the coils promotes bone consistency both qualitatively and quantitatively.
· Double-principle self-tapping coil for both a better contact with the bone and primary stability.
· Tapered apical portion with large cutting areas for greater penetration capacity.
· Atraumatic apex.

ImpLassic HX3 is available in diameters Ø3.25, Ø4.0 and Ø4.5 and in different lengths, according to the diameter (8, 10, 11.5, 13 and 16 mm).

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DentalTech®

DENTAL IMPLANT SYSTEM

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Dental Tech

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• IML SA

UNIVERSE 2.9 IMPLANT

Manufacturer: IML SA Swiss Dental Implants

Morphology and Features:
root-shaped implant, with double differential spiral thread also present in the apical part. The alternate spur and square double spiral loop generates a perfect balance between intrusive, compressive, and diverging forces capable of providing the bone with extraordinary growth stimuli.
The implant is made of medical nano-structured grade 4 titanium that is the most resistant titanium alloy. The aggressive design and the good biomechanical behaviour of the Universe 2.9 implant allow successful implant therapies also in compromised situations such as narrow ridges and limited interdental spaces. It has also best performance in the cases: aesthetic position, thin crest bone, D1-D3 bone density, immediate loading, delayed loading, single-tooth restorations

Surface: SL treatment, technically comparable to the best SLA® treatments. It suits any type of bone thanks to its ability to increase primary stability even in the presence of atrophic sites or compromised biological tissue.

Available Implant Lengths (mm): 10 – 11.5 – 13 – 15

Available Implant Diameters (mm): 2.9

Seating Position To The Bone Crest: 1mm under the bone crest

Abutment-Implant Connection Type: Twelve-sided Morse-taper internal connection, operated by a passing screw. The design of the prosthetic part is provided with hexagonal connection that facilitates the procedure during the prosthetic phase.

Index type abutment repositioning: Twelve-sided Morse-taper internal connection: 12 possible abutment positionings

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www.iml-ch.com // info@immediateload.com

• IML SA

UNIVERSE IMPLANT

Manufacturer: IML SA Swiss Dental Implants

Morphology and Features:
Conical shape, with double differential spiral thread also present in the apical part. The alternate spur and square double spiral loop generates a perfect balance between intrusive, compressive, and diverging forces capable of providing the bone with extraordinary growth stimuli. The collar, which has microgrooves, varies according to the diameters and lengths of the system and ends with a smooth switching platform, a feature that promotes high biofunctionality and homogeneous distribution of mechanical stresses. The prosthetic parts size is the same for all diameters.

Surface: SL treatment, technically comparable to the best SLA® treatments. It suits any type of bone thanks to its ability to increase primary stability even in the presence of atrophic sites or compromised biological tissue.

Available Implant Lengths (mm): 6 – 8 – 10 – 11.5 – 13 – 15

Available Implant Diameters (mm): 3.4 – 4 – 4.5 – 5

Seating Position To The Bone Crest: 1mm under the bone crest

Abutment-Implant Connection Type: Twelve-sided Morse-taper internal connection, operated by a passing screw. Such locking 6° taper connection with a passing screw achieves a precise and functionally perfect fit, offering a perfect antibacterial seal. The design of the prosthetic part is provided with hexagonal connection that facilitates the procedure during the prosthetic phase. This type of connection is the only one that approaches the ideal condition of the one-piece implant, universally proven to be long-lasting.

Index type abutment repositioning: Twelve-sided Morse-taper internal connection: 12 possible abutment positionings

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UNIVERSE 2.9
System

iml
swiss dental implants

NARROW SIZE
WIDE OPPORTUNITIES

Best performance in the cases:

- aesthetic position
- thin bone crest
- D1-D3 bone density
- limited space between front teeth
- immediate loading
- delayed loading

IML and its commercial Partners:
Together, towards a new Ethical Implantology.

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• iRES Sagl- Swiss Implant Company

RELIABLE, EFFICIENT AND SAFE SOLUTIONS FOR ORAL SURGERY

Based in Switzerland, iRES® is a European ISO 13485 certified company specialized in developing, manufacturing and distributing a wide range of medical devices for oral surgery with specialized production units with more than thirty years of experience in the medical field.

Implant system main features
iRES® implant systems, designed by the best dental professionals and bio-medical engineer, facilitate surgical and prosthetic procedures and improve functional and aesthetic performance.
One surgical kit for all the implant systems.
A rationalized and simplified prosthetic system allows, for each abutment type, to fit all the implants diameters.
SHAPEONE®, fine triple thread with conical apex and body, cutting coronal thread for a better forces discharge on cortical bone to provide excellent stability even in few millimeters. 55° triple thread over the entire body implant with a pitch of 1,8 mm (0,6 mm/thread), each turn allows to go down of 1,8mm. 3 apical aggressive cuts provide a better primary stability and centering of the implant.
iMAX®, fine double thread, conical apex and slightly conical body. 55° double thread over the entire body implant with a pitch of 1,2 mm (0,6 mm/thread), each turn allows to go down of 1,2mm.
iMAXMUA® (One piece implant with MUA abutment) no connection between implant and abutment for a total elimination of the microgap and the bacterial infiltration. It allows the use of a retaining screw of 1.72mm instead of 1.4mm actually in the market.
VOLUTION®, large double thread with conical ogive body and pitch of 1,8 mm (0,9 mm/thread), each turn allows to go down of 1,8mm.
The future of implantology, against the peri-implantitis and aging implants, to guarantee the long term success.

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• iRES Sagl- Swiss Implant Company

IMPLANT SYSTEM IMAX

Manufacturer: iRES SAGL (Lugano - Switzerland)

Morphology: Cylindrical coronal part, slightly conical implant body, conical apex, flat tip, 2 apical and helicoidal cuts. 55° double thread over the entire body implant with a pitch of 1,2 mm (0,6 mm/thread); each turn allows to go down of 1,2mm, speeding up the insertion phase, increasing the insertion torque.

Surface: Surface treatment (sand blasting with small and large grits, double etching acid, cold plasma decontamination) - Sterilization gamma ray. Machined (no surface treatment on the body implant) - Hybrid (partial surface treatment on the body implant) 1mm neck machined (surface treatment on the body implant) - Hybrid with hyaluronic acid (partial surface treatment on the body implant with hyaluronic acid allover the body implant).

Available Implant Lengths (mm): 6 - 8 - 10 - 11.5 - 13 - 16

Available Implant Diameters (mm): 3.3 - 3.7 - 4.1 - 4.7 - 5.2

Seating Position To The Bone Crest: Bone level - OnePiece for iMAXMUA

Abutment-Implant Connection Type: Internal and external exagon - Tissue level for iMAXMUA

Index type abutment repositioning: One of the exagon face

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MULTYSYSTEM WORLD

Multysystem is a company specialized in the production dental implant since 1992. The long company tradition carries on the high quality made in Italy and opens the door to digital innovation for some years now. The corporate philosophy has led to the creation of **Multysystem World**, a universe of products and services pursues to the customer satisfaction in dental practice.
MULTYSYSTEM WORLD is:

• IMPLANTOLOGY

A wide range of biphasic and monophasic dental implants with a panorama of prosthetic solutions, in order to successfully face all the clinical needs of the patient.

• ADVANCED REGENERATIVE SURGERY

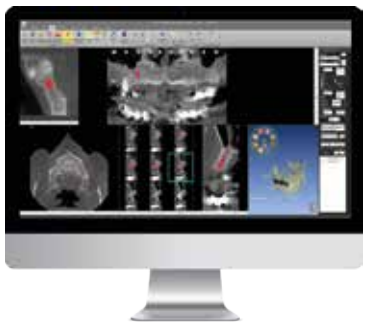
Surgical sets for surgery and auxiliary equipment for PRF and PRGF.

• BIOMATERIALS

Membranes, bone substitutes in granules, blocks and putty.

• MDS MULTYSYSTEM DIGITAL SOLUTION

Let's Go To Digital - Multysystem Full Digital Workflow provides different solutions: from anamnesi to surgery, from model scanning to prosthesis with Multysystem 3D guided surgery software, hardware, training tutoring and partial coaching by our experts.



Multysystem srl
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• Maco Dental Care

MaCo Dental Care just concluded its twenty-fifth year of presence on the dental market and, once again, it confirmed how every goal can be achieved by pursuing a winning idea and building a reliable and versatile profile.
This Italian company was established as a result of the will of a group of young dental professionals eager to put to good use their experience and to create their own brand. The company has thus started the production of implants, within its plant in the industrial complex of Buccino, just 100km south of Naples.
In the initial phase, the dental implants design focused on standardized and widely used connections, developing an external hexagon implant, Omnia, two internal hexagonal connection, Introskip and Seventeen, the Easy mini implant, a Three Lobes connection and the Octoplus octagonal connection.
In recent years, however, MaCo has defintely changed gear by introducing switch platform system on the already well-known Seventeen implant, which has evolved into Seventeen-One, and introducing on the market Conical Active, a well received conical connection implant.To date, MaCo offers eight different connections guaranteeing specialists a wide choice able to satisfy every kind of specific need related to the single case to be addressed.
The quality control system is based on maximum efficiency and safety, certified to comply with the standards established by ISO 13485. Produced devices are issued with CE marking.
The company growth isn't limited to manufacturing and, perhaps, its market development is even more remarkable. MaCo Dental Care implants, in fact, have established an increasingly relevant presence on the market and their diffusion abroad is the result of a winning choice: to guarantee very high quality standards, while remaining in an accessible price range. In many countries, MaCo Dental Care started to promote its products through participation in international events and trade fairs, gathering increasing acclaim and, in some cases, the company has further strengthened its position opening subsidiary branches of the parent company. MaCo Dental Care Mexico was the first example of this type and is, for many years, a well-known reality of Mexican implantology. Following the Mexican experience, MaCo Dental Care has operated in a similar way in other countries and currently distributes its products in Europe, Northern Africa, Middle East and Latin America. In addition to the commercial distribution, MaCo Dental Care carries out a continuous training activity in the countries where it distributes its products, through courses, seminars and workshops held by Italian and international specialists.
MaCo Dental Care has recently marked a significant turning point in its market approach, investing significantly in the digital sector: an increasing number of professionals, in fact, rely on the use of advanced tools and applications for their daily work. The aim of the company is to offer its customers, alongside reliable and innovative implant systems, core business for which it is already known and appreciated, all the tools required to advanced dentistry to operate and keep up with the times: desk scanners, intraoral scanners, micromotors, biomaterials and, specially, its own guided surgery system that allows to manage all the digital flow and to operate with a dedicated surgical instrumentation. MaCo Dental Care is always looking for new energies and new distributors willing to accept this completely "Made in Italy" challenge.

IM Macon

MaCo also implemented its implant catalog in search of solutions that better meet the needs of the clinical community. This philosophy led the company to IM Macon, a short type fixture conceived by dr. Ennio Calabria. It is a short implant designed to guarantee minimum invasiveness, creating the least biological trauma and exploiting even the smallest resources that oral tissues make available to us, avoiding, as far as possible, the need for patients to undergo more complex and exhausting surgeries.
This implant offers many peculiar characteristics, some of which represent absolute innovations, specifically patented:
· IM Macon is designed to reduce or eliminate the risk of peri-implantitis thanks to the large emergence of the abutment base which gives a biological width as close as possible to the natural tooth
· The design with inclined platforms increases the implant-bone contact surface.
· The absolute novelty is represented by the double anti-rotation system, present both in the lower and upper part.
· IM Macon guarantees high prosthetic stability without the use of a tightening screw.

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MADE IN ITALY

MaCo DENTAL CARE

Welcome to a brand new world

CONICAL ACTIVE

DIAMETERS
Ø 3,5mm
Ø 3,9mm
Ø 4,4mm
Ø 5,5mm

- *Conical connection with internal antirotational hexagon*
- *Switch platform system*
- *Anti percolation tapered connection*

SEVENTEEN-ONE

DIAMETERS
Ø 3,30mm
Ø 3,75mm
Ø 4,20mm
Ø 5,00mm
Ø 6,00mm

- *Internal hexagonal connection*
- *Switch platform system*
- *Coronal microthread*

IM MACON

DIAMETERS
Ø 3,1mm
Ø 3,6mm
Ø 4,1mm
Ø 4,6mm
Ø 5,1mm

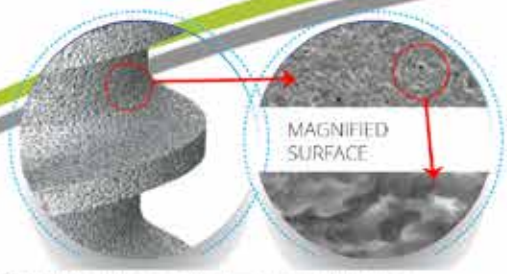
- *Short implant with tapered connection*
- *High prosthetic stability without fixing screw*
- *Sloped platform design with wide bone implant surface*

EASY

DIAMETERS
Ø 2,3mm SUPERIOR
Ø 2,0mm INFERIOR

- *Mini implant designed for stabilization of total prostheses*
- *Sphere of 1,8mm*
- *Simplified and minimally invasive surgical protocol*

IMPLANTS FEATURES



MaCo Surface All implants are sand blasted and acid etched to improve their biomechanical characteristics. This treatment generates microcavities, comparable in size to those of the osteocytes, that facilitate the osseointegration.

98,2%

Reliability and durability MaCo Dental Care implants have a success rate among the highest in the sector.

Wide prosthetic choice All implant lines provide the specialist with all prosthetic components and instruments needed to better manage the specificities of each case.

kiwa certified CERMET CERTIFIED MANAGEMENT SYSTEM

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• Oxy Implant

FIXO Line

The Fixo line system consists of one-stage implants, ideal for the Surgeon who plan an immediate loading rehabilitation. In their one-piece body they integrate a multi-unit-abutment, with 0°, 17° or 30° angulations, in order to fix the disparallelism consequent to the insertion of implants with different inclinations.

To promote optimal soft tissue management, the collar is realised with a particular anatomical conformation, available in two different heights - short and long - adaptable to any morphology. The pink colour also allows the perfect harmonization with the gingival papillae, for an excellent treatment result also from the aesthetic point of view.

Fixo is therefore a "fast" implant: it does not require the screwing of the multi-unit-abutments and the radiological check of their tightening. Consequently, the operating times and the required effort have considerably decreased, to the benefit of the patient's comfort.

Fixo is also "safe": the absence of a connection between implant and abutment determines that the annoying problems resulting from bacterial infiltrations and micro-movements can no longer occur.

The chamfer has a considerably reduced size: in fact, rotating the Fixo around the vertical axis in the morphologically worst case (17° angulation of the Mua platform and 2 mm collar), its outermost point describes a circumference of 4.8 mm, against that of 7 mm diameter obtained in the same way by a traditional "implant + mua" system.

This determines that, even in the most unfavourable situation, the Fixo can be inserted without the use of bone-mill drills, with the consequent safeguard of the bone quantity.

The inclination of the collar relative to the horizontal axis, much more "open" than currently used, promotes better patient's cleaning: plaque accumulation is therefore reduced, minimising one of the causes that determine the onset of dangerous peri-implant inflammations.

The connection between the prosthesis and Fixo is realised with a M1.8 screw, 2.5 mm long, which can be tighten with a 30 Ncm Torque. In this way, the problem of the possible breakage of the small M1.4 screw, traditionally used in screwed prostheses, due to the considerable chewing loads, is prevented.

Fixo, considered the perfect coaxiality of the implant-mua monobloc and the reduced diameter of the chamfer, is easy to use with the most popular guided surgery systems. Taking into account these characteristics, during its insertion there is no interference with the guiding sleeves positioned in the surgical guide. The template is simply removable at the end of the intervention.

However, the tools available in the dedicated surgical kit allow the Fixo to be used easily even in traditional surgery: a specific guide, for example, can in fact provide support in creating the implant site with the best angulation and also, the particular pins allow to evaluate previously what is the best angle of the multi-unit-abutment platform to be used in each single case.

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fixo

break the speed limits simply and safely

Made in **Italy**

Made in **Oxy**

Three components in a single device.
A Unique product for traditional and guided surgery.
The solution for a quicker, safer and easier immediate loading.

PATENT PENDING

OXY implant
DENTAL SYSTEM

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ROOTT
open implant system

Rootт Open implant system

Created for dentists by dentists

TRATE

The ROOTT Implant System was developed and is being constantly upgraded by TRATE AG in close cooperation with members of Open Dental Community.

The ROOTTCONCEPT has dispensed with the overcomplicated treatment procedures recommended by implant manufacturers who are limited by their products on the market.
The ROOTT philosophy is to create the ideal artificial tooth which organically integrates with existing biological structures in the simplest way.

The system development aims at reflecting the collective view of independent dental experts throughout the world, thus TRATE AG closely cooperates with the Open Dental Community NPO (Luxembourg). This approach helps to avoid reliance on individual opinions and makes dentists free to select the method most suitable for the patient.

Back in the old days original implants' design had a form of a straight parallel wall. But since then science has greatly moved on with the modern designs being tapered. The tapered design (also known as "V-shape design", "tapered shape design") imitates the root of a real tooth. This kind of design allows more placement options and more room available for finding the best position for it, especially in cases when the implant placement should perform in a limited space. And it makes always more sense to go with the patterns of nature rather than with an artificial straight wall design that is contrary to nature.

Besides that, the V-shape design allows to preserve more bone. When inserting a tapered implant less bone gets displaced than with a straight wall design. The diagonal V-shape design has proven to provide a greater primary stability than just a straight body design.
Rootт open implant system has 3 implant family designs - **ROOTFORM** (two-piece implants), **COMPRESSIVE** and **BASAL** (one-piece implants).

The core is the two-piece implant ROOTFORM - it has an aggressive implant body design with a deep tapered conical connection and an indexing hex. Besides that, wide variety of prosthetic options make it a very versatile system. Rootform implants are suitable for single and multiple restorations with delayed and immediate loading in the upper and lower jaws in all types of bone tissue. Implant can be placed by flap or flapless approach. Implant placement is also possible immediately following tooth extraction, in case sufficient bone tissue is available vertically and horizontally.

Sizes. A wide variety of diameters from 3.0 to 5.5 mm and large selection of lengths from 6 to 16 mm allows always to find the right size of implant for a patient. Special design of ROOTT conical connection allows to create a special size of an implant with minimum diameter of just 3 mm, which makes possible to replace lower incisors easily and in some cases due to a great torque load even immediately.

The same platform for all diameters. For all diameters of ROOTFORM implants one platform was developed. No matter which diameter of implant will be used, there will be no need to care if it is correct platform or not. It helps to eliminate the stock and to simplify practice.

Conical connection. Flat-on-flat connections were proven to create a micro-gap between the abutment and the implant while chewing. This constant opening & closing begins to act as a pump that sucks in all kinds of bacteria, which can lead to peri-implantitis and implant prolapse. That's why TRATE developed ROOTFORM implants with conical connection. This connection is so tight that there is no micro-gap visible even under an electronic microscope.

Multi-functional part gratis. Each ROOTFORM implant comes together with a free multi-functional part (CRE) which is made of the same material as implants and abutments. Many of dentists use CRE as temporary or permanent straight abutment. It's possible to reduce the costs up to 30% simply by using CRE part as abutment.

· **COMPRESSIVE** - the compression screw implant is ideal for simplified immediate loading protocols in healed edentulous ridges. It is used for multiple unit restorations with immediate loading in the upper and lower jaws with adequate bone tissue. It can be used in combination with basal implants and allows flap and flapless placement. Abutment direction can be adjusted using a special instrument up to 15° relative to the implant axis. It can be used with caution to create single restorations in situations

where high primary stability is achieved on placement. There is wide variety of diameters from 3.0 to 5.5 mm and large selection of lengths from 6 to 20 mm.

· **BASAL** - the axial bicortical screw design is used to treat the more challenging cases with simplicity and efficiency. They can be placed in extraction sockets and in healed bone as well. The structural characteristics allow placement in bone that is deficient in height and width. They can be placed with flap or flapless technique. They can be used to bypass the mandibular nerve, and for engagement of the cortical bone at the fusion of the pterygoid with the maxilla. They also can be used in combination with Compressive implants. There is wide variety of diameters from 3.5 to 5.5 mm and large selection of lengths from 6 to 26 mm.

Both types of one-piece implant have all varieties of prosthetic components - closed tray transfer, implant analogues, burn out copings, angulation correction burnouts and shoulder burn out. The abutment is also compatible for intra oral welding protocol.

Bendable neck. The implant has bendable neck design that has a specific diameter and length that gives the implant neck the unique ability to be bent so, as to correct the abutment angulation when needed.

Simplicity. The compressive implants provide a very simple protocol for surgery and prosthesis, that works especially well for patients who would not like to go for conventional implant surgery.

Open implant system Rootт is constantly developing system, which aims to solve different and the most challenging tasks in the field of implant dentistry.

For example, Rootform implants as well as Compressive and Basal implants have innovative prosthetic option – telescopic fixation, which doesn't need ***screw or cement***. Conometric fixation provides a way to retain prosthesis, additional abutment modifications, without the need of cement or screw. Conometric fixation works on the principle of frictional contact and elastic deformation of the connecting coping. The abutment profile of all one-piece implants allows usage of an external connection system – conometric. In case of two-piece implants you just need to use the special type of abutment which is suitable for conometric caps. These and other numerous factors ensure the best biologic and prosthetic outcome. Conometric prosthetic solution with patented lifting technology for multiple unit restorations allows fixation of crown without screws or cement, that is easy but strong.
Another one example of useful innovations is unique bone builder screw for two-piece implants. Special design of the screws GF0 and GFN0 allows to grow bone on the top of the implant platform. As a space maintainer Screw Bone Builder reserves the spatium and keeps the soft tissue far from the implant platform, stopping the soft tissue migration process and giving to the bone a chance to migrate and fill in the empty space. Reserved spatium between 2 platforms (implant and screw) is about 1 mm.

This space will be filled with the blood and then a clot or a fibrin clot will fill this hollow. The bone cells will use this fibrin clot to migrate through this space and build a new bone. Screw Bone Builder allows to get complete coverage of the implant platform by bone, which means extended periosteum. Increase of the bone surface will enhance the vascularization of the periosteum and will allow more collagen attachment on the top of the implant.

Recent product innovation of Rootт are the angulated multi-unit abutments for two-piece implants, which were developed to provide the dentists with a wider range of comfortable solutions and prosthetic options. They are similar to the current regular multi-unit abutments, but now there is a choice of three different angles (15°, 30°, 60°) for each of four sizes.

Angulated multi-unit abutments allow to insert Rootform type implants at a wider range of angles, for example, when the angle between two Rootform type implants is wider than 60° and regular multi-unit abutments are insufficient. Angulated multi-unit abutments are also essential in cases with severe bone atrophy, when Rootform type implants must be inserted not perpendicularly, but angularly to the bone level, in order to achieve higher primary stability, to avoid sinus lifting procedure on the maxilla or to ensure nerve bypassing on the mandible.

Dental implant manufacture based on Open Dental Community members experience left in the system essential parts and because of it could offer products and services that are of the highest standard and at extremely competitive rates.

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• Trate

Compressive implants with conometric prosthetics solution

The abutment profile of Compressive implants allows for the use of an external connection system – conometrics. Conometrics provides a way to retain prosthesis, additional abutment modifications, without the need of cement or screw. Conometrics works on the principle of frictional contact and elastic deformation of the connecting coping. These and other numerous factors ensure the best biologic and prosthetic outcome. Using Conometric prosthetics solution with patented lifting technology for multiple unit restorations there is no need to use more screws or cement. It has easy but strong telescopic fixation.

Manufacturer: TRATE AG

Morphology: one-piece implants with tapered shape design and telescopic titanium or PEEK caps for conometric prosthetic solution in case of multiple unit restorations with immediate loading.

Surface: Sand blasted with HA-TCP and acid etched

Available Implant Lengths (mm): from 6 up to 20

Available Implant Diameters (mm): from 3,0 up to 5,5

Seating Position To The Bone Crest: crestal

Abutment-Implant Connection Type: one-piece implants

Index type abutment repositioning: slots

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• Trate

Unique implant for pterygoid region

The Compressive MP implant is a pterygoid implant with a multi-unit abutment for screw-retained restorations with a special combination of compression thread like and wide thin leads for extra stability in pterygoid area. It is used for cement free multiple unit restorations with immediate loading in the pterygoid area. It can be used in combination with Compressive M, Compressive MS and Rootform implants with multi-unit abutments and allows flap and flapless placement. Abutment direction can be up to 30° relative to the other implant axis.

Manufacturer: TRATE AG

Morphology: two-piece implant for multiple unite screw-retained restorations in the pterygoid region.

Surface: Sand blasted with HA-TCP and acid etched

Available Implant Lengths (mm): from 16 up to 26

Available Implant Diameters (mm): 3,5; 4,5.

Seating Position To The Bone Crest: crestal

Abutment-Implant Connection Type: external platform, flat

Index type abutment repositioning: star

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• Ziacom

Ziacom Medical Conical connection

GALAXY®
ZV2®

Manufacturer: ZIACOM® manufactures and comercializes dental implant systems for more than ten years, offering a wide range of products and solutions in oral implantology. The philisophy is based on high quality products and competitive prices. ZIACOM® implants are manufactured with Zitium® high performance grade 4 titanium, wich gives it a substancial improvement in its elastic limit and mechanical properties.

Morphology: GALAXY® has tappered body with double thread and variable geometry that provides fast insertion and high primary stability.The combination between the thread and the active apex makes the implant insertion easy with undersized drilling technique. GALAXY® is suitable for inmediate loading and imediate post-extraction placement.
ZV2® is a straigh body implant with a slightly tapered core in coronal area. The thread has been desing in reduction up to platform that provides high primary stability. The apex has atraumatic design to protects anatomical structures. ZV2® is suitable for any type of bone, therefore can be placed at any position.

Surface: Osseonova® surface, textured by subtraction using sandblasting with white corundum and double etching of hydrofluoric acid and a combination of sulphuric and phosphoric acid, creates a macro and micro porosity with optimum average values whose key characteristics for achieving a correct and rapid osseointegration which gives it reliability and predictability.

Available Implant Lengths (mm): Five different lengths GALAXY®: 8.5 / 10 / 11.5 / 13 / 14.5
Five diferent length ZV2®: 6 / 8 / 10 / 12 / 14 available acording diameters.

Available Implant Diameters (mm): Single prosthetic RP platform in three different diameters 3.4 / 3.7 / 4.0 / 4.3
RP and WP prosthetic platform in three diferents diameters 3.4 / 4.1 / 4.8

Seating Position To The Bone Crest: Galaxy® and ZV2® implants platforms should be placed at bone crest level.

Abutment-Implant Connection Type: The conical connection consist on 11° morse taper with double internal hexagon as anti-rotational element. The connection ensure conical friction and sealing that reduces micro-movements and infiltration. The platform switch allows better representation of biological with and long term aestethic stability.

Index type abutment repositioning: In cases of anti-rotational (engaged), hexagonal prosthetic connection allows six different positions.There are rotational (non-engaged) abutment for multiple restoration without index.

Visit us at:
• EXPODENTAL 12-14 March 2020, Madrid, Spain, Hall 8, Booth 8D04 - 8D05

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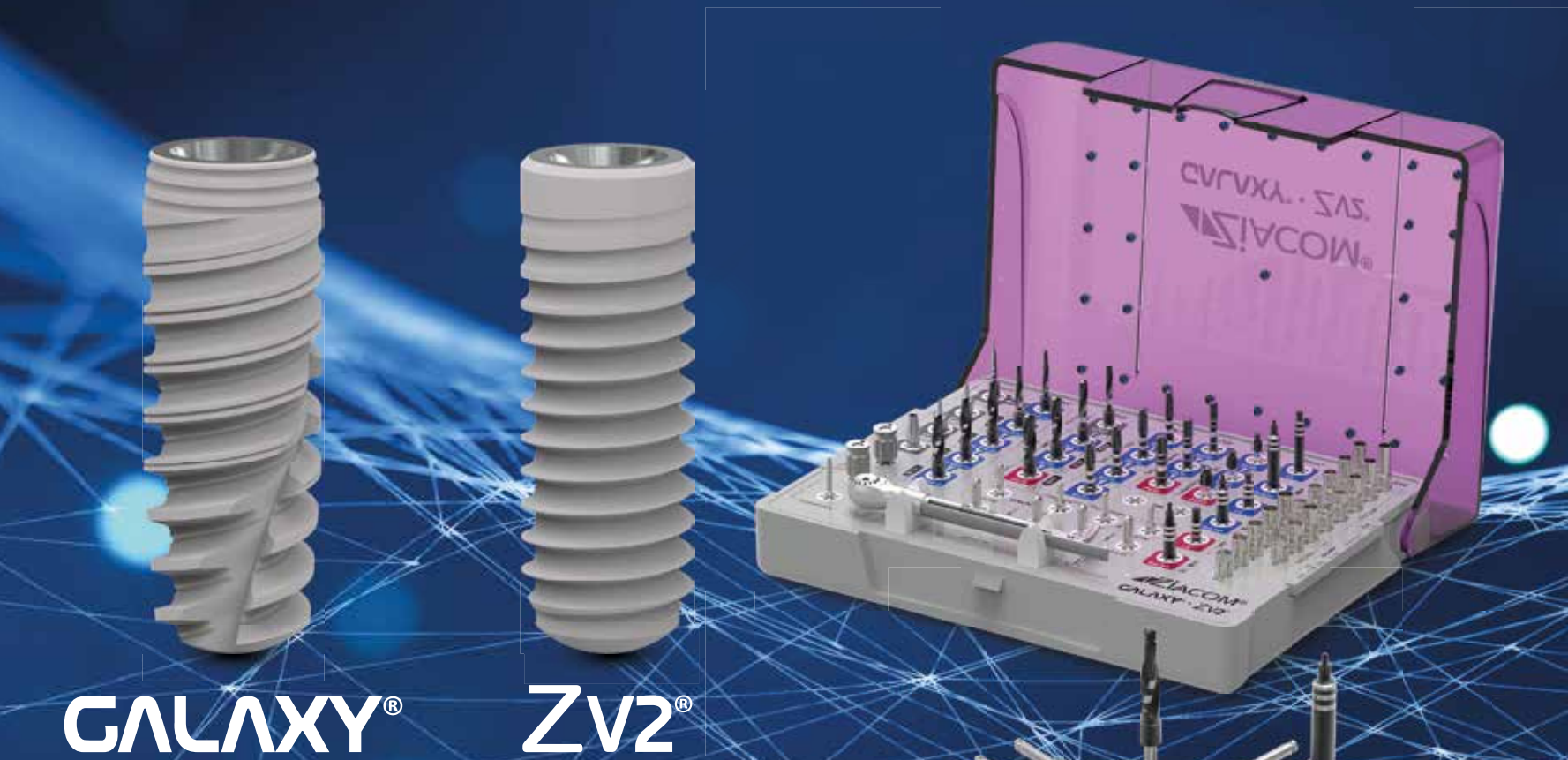

GALAXY® ZV2®

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MONTEMURRO UTENSILI

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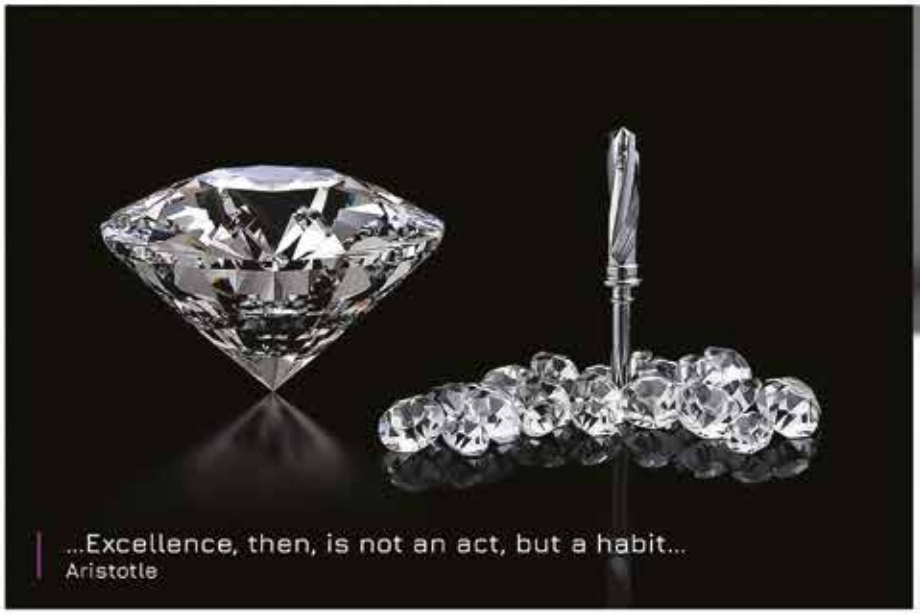

We are the best partner for dental implant manufacturers

Quality and precision specifications:

Material:	420B stainless steel hardened 54HRC
Cylindricity:	within 0.003mm
Eccentricity:	Less than 0.009mm
Roughness:	Ra <0.15 m
Cutting edge preparation:	Honing radius 8/12 m
Electro-polishing and Passivation:	For an excellent resistance to corrosion

Additional services:

Coating:	DLC and TIN, with certification of non-cytotoxicity
Color Coding:	High quality composite ceramic enamel with biocompatibility certification
Laser Marking:	Personalized in every detail
Warehouse management:	Stock management and programming annual supplies

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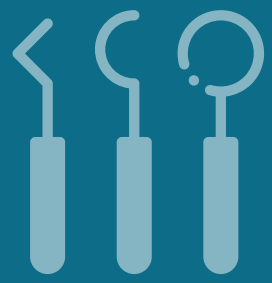


AROUND IMPLANTOLOGY

3DIEMME

RealGUIDE Software Suite

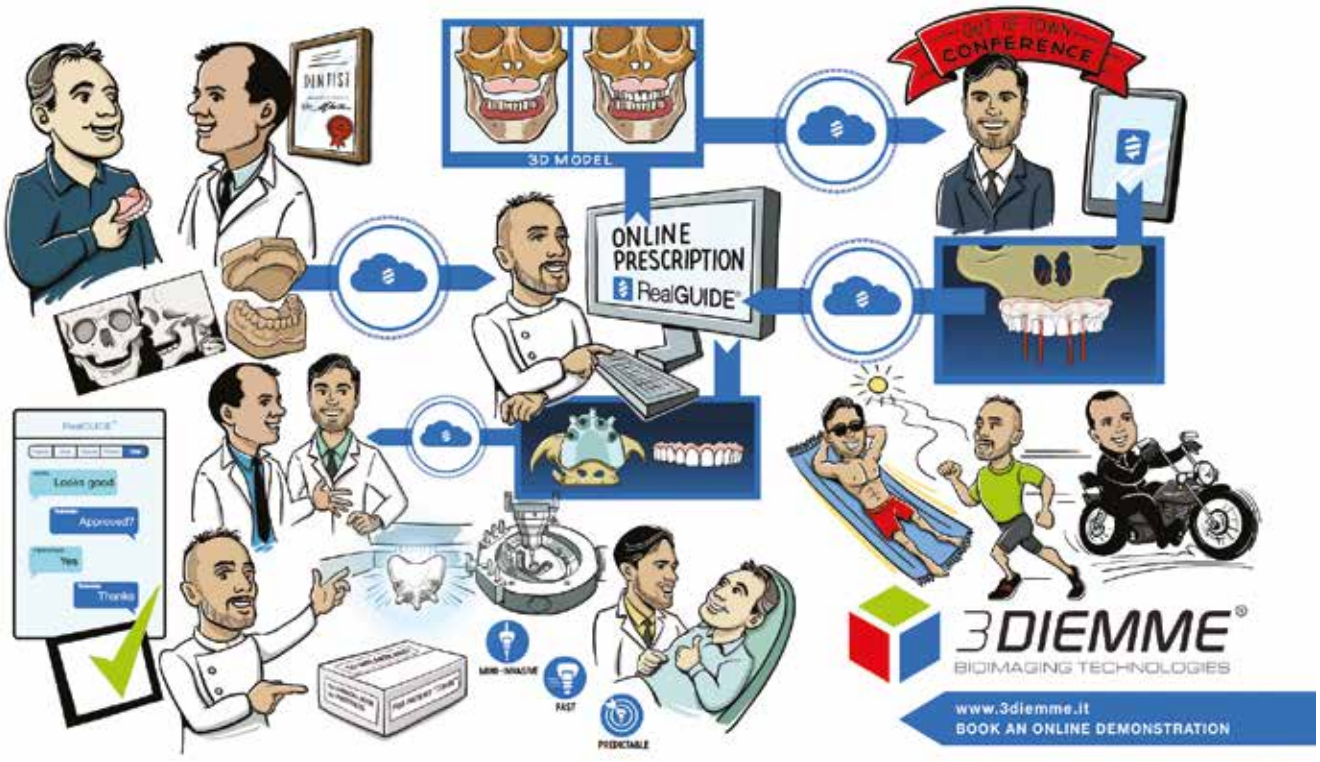
Discover the World's first open system integrating 3D imaging, implants planning and prosthesis modelling applications on mobile devices and cloud environment

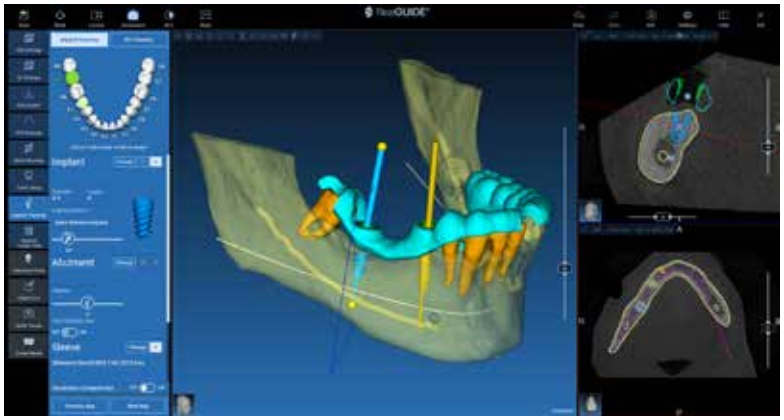
3DIEMME presents the new revolutionary dental imaging, surgical guides planning and prosthesis modelling application running on any device: PC, MAC and, above all, on mobile devices (tablet/smartphone, running iOS).

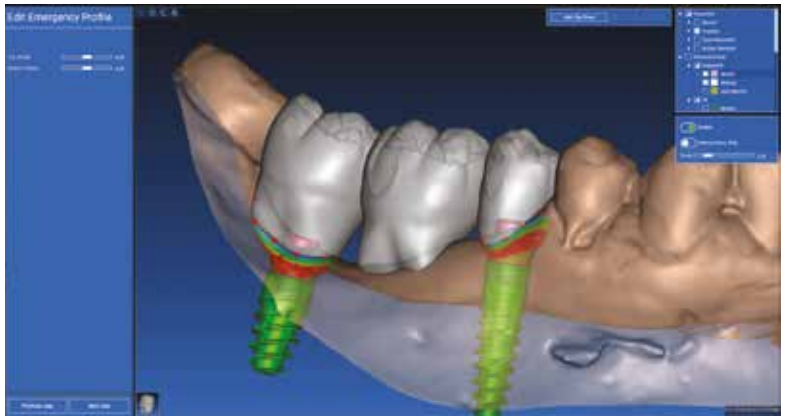
The new software suite, strong of 12 years of experience in digital dentistry procedures management and used by International Doctors and Labs to manage thousands of clinical cases per year, includes the following modules:

- **RealGUIDE START:** free application to collect all the Patient's data (DICOM images from CBCT/CT, STL files from intra-oral scanners or laboratory models acquisitions, pictures and documents), visualize them and manage the data upload to the cloud server and mobile applications
- **RealGUIDE APP:** easily view, plan, share and manage the digital treatment with the tip of your fingers, thanks to the beautiful and simple APP design
- **RealGUIDE PRO:** advanced 3D diagnosis, semi-automatic virtual teeth extraction and bone segmentation tools, implants planning from a full library including prosthetic components
- **RealGUIDE DESIGN:** surgical guides modelling, STL files processing, individual trays and models with implant analogues holes management
- **RealGUIDE CAD:** prosthesis design, including wax-up, crown and bridges on teeth and implants, immediate loading prosthesis and reinforcement bars, custom abutments and much more!

The new RealGUIDE software suite involves, through the cloud, all the figures in the digital dentistry world: the radiologist can per-







form a full diagnosis (also thanks to the new RealBODY 3D engine) and prepare the exam for the dentist that can easily share it with his laboratory to integrate the prosthetic planning and optical scans to the project. Starting from the complete virtual patient (including bone, gums thickness and ideal teeth positions) the doctor can plan the implants on his iPad or iPhone and share the project with other colleagues and the Patient as well. The final project can be sent back to the laboratory for the surgical guide modelling in the DESIGN module, as well as the provisional prosthesis modelling the CAD module or with any CAD/CAM system, thanks to the open project data exported in STL format from the 3DIEMME suite. The new CAD module, presenting many innovative features compared to the similar software packages on the Market, is also available as a stand-alone product and it includes ALL the prosthesis modelling related features in a single license.
The licensing system, mainly based on a subscription service model, is innovative and totally suited to the customer's needs, giving the chance to everybody to enter the digital dentistry world without huge software investments.

Main functions of the RealGUIDE APP:

- 2D/3D DICOM viewer (diagnosis and communication with the Patient)
- STL files viewer (from intra-oral and desktop scanners and for lab communication)
- **Implants planning** for guided surgery (and project uploading for surgical guides and immediate loading prosthesis manufacturing)
- Pictures viewer (JPG/BMP/PNG...)
- Online sharing and real-time chat with user defined private groups and social networks
- CLOUD data management and offline processing on any device (PC/MAC/mobile devices)
- Automated email and push notifications management for the project development status communication

The full suite can be customized and rebranded (OEM versions) for all the implants, CBCT and CAD/CAM Companies that want to integrate the most revolutionary digital dentistry application into their existing business model. In particular, thanks to the CLOUD environment, 3DIEMME can integrate the clinical projects management into the Company ERP and CRM systems; in this way all the information connected with the planning is directly sent to the dedicated Company Department in an uninterrupted workflow, reducing the risk of losing important data and involving the Production, Marketing, Administration and Sales Departments at the same time.
3DIEMME offers a full set of solutions that start from providing the digital modelling service Worldwide to creating dedicated software products and workflows to International Organizations, based on long term partnerships.

www.3diemme.it - www.realguide.it
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BOREA

With Rayplicker™ say «Yes» to digital dentistry!

Borea is a French company that designs, manufactures and markets dental shade-taking devices. Borea's mission is to provide dental surgeons and laboratories with innovative solutions to improve comfort and quality in their day-to-day practice.

The flagship product of Borea is "The RayplickerTM". This solution allows to obtain in a single acquisition complete shade mapping and translucency of a tooth. Visualize easily the tooth overall shade, a 3 or 9 parts shade or a detailed mapping pixel by pixel. The dental surgeon or the dental technician can, thanks to the RayplickerTM, take the color in a reliable and reproducible way, without influences of the external environment. To complete this shade-taking, a dedicated mobile application "RayplickerTM Pics App Solution" offers the possibility to attach pictures of the patient's mouth and face and to edit and send an objective and complete order to the laboratory.

The Rayplicker software allows thanks to a Cloud connection, a direct link with the laboratory in real time, the transmission of all the necessary technical data and ensures the traceability of the latter. This software enables image treatment tools as well for an in-depth color analysis.

RayplickerTM also offers the possibility of choosing measuring head, its sterilizable tip enables the device self-calibration and guarantees the user against all cross contaminations.

Rayplicker is the easy-to-use solution for fast and reliable shade-matching. Its intuitive interface, user-friendly features and ergonomics make it the necessary device in every dental practice and labs.

Advantages:

Time saving & profitability
A complete color analysis in a few seconds. High Return On Investment.

Accuracy
Ultra accurate pixel analysis.

Reliability
Patented technology offering objectivity and repeatability.

Hygiene
Protective sheats, sterilizable calibration tips.

Digital files
To ensure better traceability and sharing without loss of information.

Ergonomy
Touch screen, miniaturized measuring head.

Plug & Play
Self calibration of the device.
A unit designed for the ease of use.

Flexibility
Configure the shade guide of your choice. Up to 4 user profiles.

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BOREA

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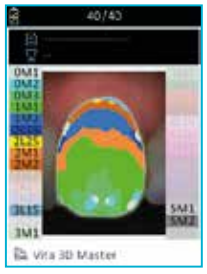
Discover the fully digital shade scanner!

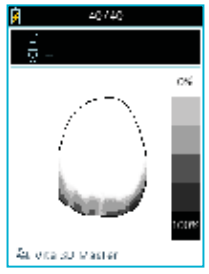

Polarized picture


Overall shade

3 parts mapping


9 parts mapping


Detailed mapping


Translucency

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Rayplicker™ is a medical device Class I.
Manufacturer: BOREA.
CE mark according to 93/42 CEE.
For professional use only.
Read carefully the user manual before use.

SmartBone®

The next frontier of bone regeneration

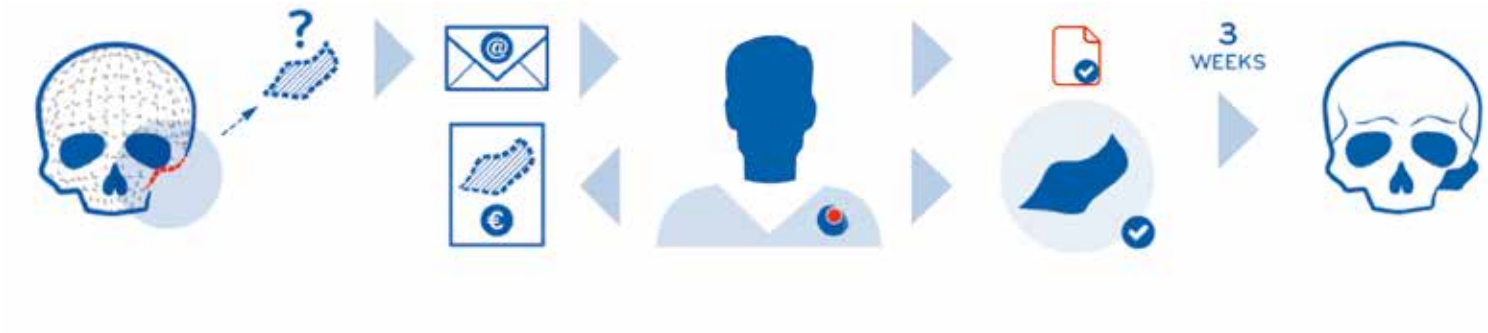
SmartBone® is a bone substitute produced by the swiss company IBI SA (Industrie Biomediche Insubri SA).
The company focus is on research, development and production of medical devices for tissue engineering and regenerative medicine: substitutes, grafts, 3D matrixes and 2D scaffolds. IBI SA pays extreme attention to safety and quality, for this reason is ISO13485 certified.
In 2012, SmartBone® entered the market by confirming itself as an innovative composite biomaterial developed for bone regeneration in reconstructive surgeries.
SmartBone® is available in different shapes from blocks to micro-chips. It is produced by combining:

- Spongious bovine mineral matrix
- Resorbable biopolymers
- Collagen fragments

Thanks to its composition, SmartBone® can hence be categorized as a composite xeno-synthetic graft.
This xeno-hybrid composition guarantees exceptional biomechanical properties and promotes osteogenic process to obtain optimal and fast osteointegration. After grafting, SmartBone® is totally resorbed and replaced by patient's own bone once remodeling process is completed.

SmartBone® blocks have impressive mechanical performances:

- Withstand heavy surgical manoeuvres;
- Allow very precision shaping with any type of surgical tools;
- Have high loading resistance;
- Offer high tenacity to screws fixation and have high volumetric stability.



Its 27% open-porous microstructure mimics the human bone ones and promotes the patient's cells to efficiently colonize and to quickly grow into SmartBone®, while its biopolymers degrade, providing a perfect integration and osteoconduction. SmartBone® microchips can be easily mixed with patient blood to obtain a paste capable of being shaped for a better site filling.

SmartBone® was designed to reduce the inner variability that many other bone substitutes have, due to their natural origin. IBI SA offers homogeneous bone substitutes with regular microstructure, porosity, density and mechanical properties.

Industrie Biomediche Insubri SA provides also another service, according to the 93/42/CEE Legislation regarding custom-made medical devices, the so-called SmartBone® On Demand™.

SmartBone® on Demand™ is the custom-made bone grafts line, designed specifically for the needs of each patient, especially developed to manage complex cases. The perfect contact between the graft and the recipient site improves the integration: it allows a correct application of guided surgery techniques and lets to reduce surgery time, difficulty and risks.
4 steps to get your custom-made graft:

1. Take a CT Scan of the Patient concentrating on the defect.
2. Send the CT Scan in DICOM format to IBI-SA with a brief clinical description. IBI's trained Engineers will get in contact with you, discuss the plan and You will receive a commercial offer for your plan.
3. IBI's trained Engineers, in conformity with your indications and suggestions, will design the graft until you are satisfied from the design.
4. 3 weeks later you will receive your graft ready for the surgical intervention. No sterilization or extra shaping required.

SmartBone® On Demand™ guarantees your success:

- Custom-made to the specific needs of each of your patients;
- Ensures a perfect contact between the graft and the recipient site for improved integration;
- Ensures a precise creation of the desired shape, specifically designed for every kind of surgery;
- Helps you to resolve complex situations;
- Saves your time during surgery;
- Reduces your patient's risks;
- Helps you to reduce surgical costs.

For further information:

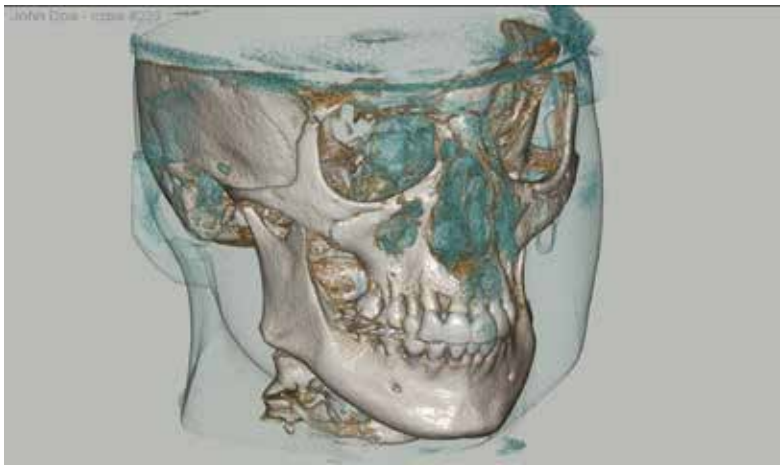
www.ibi-sa.com // info@ibi-sa.com

Implant 3 D
Guided Surgery Solutions

Discover our complete solutions for guided surgery such as planning software and surgical guide design software with open system with more than 150 implant manufactures.

Media Lab Inc. is a company which has been present in the market for more than 25 years and **produces software** for the medical and dental industry. Our Implant 3D and GuideDesign software are both **CE and FDA certified.**

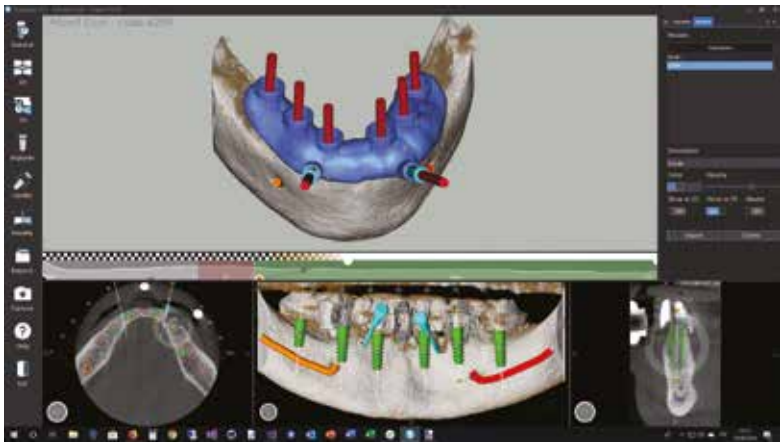
Media Lab Inc. is present at International fairs such as IDS in Cologne, AEEDC in Dubai, IDEM in Singapore and ExpoDental Meeting in Italy. The international presence of the company coupled with the desire to offer complete solutions for guided surgery such as planning software and surgical guide design software (open system with more than 150 implant manufactures), means we are always looking for reliable partners as distributors.
Implant 3D is a software that allows you to perform three-dimensional implant simulation directly on your personal computer. It simulates the positioning of implants on two-dimensional and three-dimensional models, identifying the mandible nerve, tracing panoramics and sections of the bone model, displaying the three-dimensional bone model with the ability to calculate bone density. By using Implant 3D, **the dentist can plan implant-prosthetic surgery** more safely, efficiently and quickly.
Implant 3D software allows the **design of a surgical template** for performing implant-prosthetic interventions in guided surgery. Implant 3D allows you to create gums supported, teeth supported, bone supported surgical guides.
With a **few clicks** of the mouse you can obtain an extremely precise and customized **surgical guide**. Simply by selecting the edge of the surgical guide and the **type of sleeves** to use, the software **generates the STL file** ready to be printed with a **3D printer**.

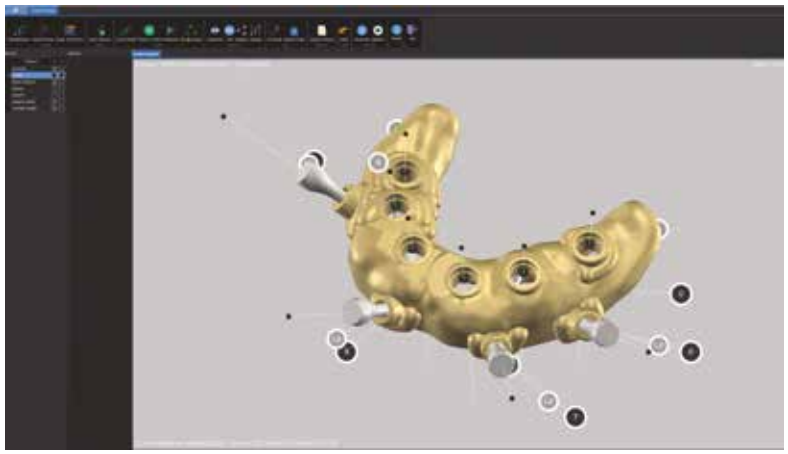


Advanced features allow you to create inspection holes and add text to better identify the printed template. Implant 3D allows you to export the perforated model for analogs based on the used implant system and the size of the analogs.

What about Guided Surgery Solutions?

The Guided Surgery Solutions ModelGuide has Implant 3D e GuideDesign as its foundation. The **ModelGuide** method has the objective of giving patients aesthetically pleasant and perfectly functional teeth, eliminating any problems that may have arisen in the past when insertion of one or more dental implants would





have created long-term surgical problems with serious inconvenience for the patient.
Following market requirements, each day our Company implements strict professionalism to provide the Clinic with a simple, cheap and efficient solution for guided surgery. At the same time, it is always committed to research and development into new technologies to always provide a state-of-the-art product.
It is now already possible to perform an integration with CAD/CAM software like an intraoral scanner, import and export Optically Scanned Plaster Model and import prosthesis.
In the **new Implant 3D software release 9.0** there will be many **important innovations**!

The digital workflow will be completed with the integration with one of the most important CAD in the dental market.

There will be a new implant zygomatic library, the integration with a **Smile Design software**, the protocol of DoubleGuide for post extractive implants and a guided surgical kit for **guided sinus lift.**

Media Lab Inc.
Piazza IV Novembre 4, Milan (Italy)

Visit us at: AEEDC 2020, Booth 4A15
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• Mariotti & Co.

PIEZOELECTRIC for SURGERY and IMPLANT MOTOR with led light made in Italy by MARIOTTI

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MUN.PZL piezoelectric unit delivers its ultrasonic power in an optimal way thanks to the innovative system of dynamic frequency control to ensure the proper supply of energy in any situation.

UNIKO.PZ device gives the double feature combining the brushless motor for implantology and the piezoelectric for surgery both with high luminosity led light.

Excellent performances in safety and precise parameters adjustment of power, vibration, torque and speed. User friendly, immediate and intuitive use by touch keyboard and wide display. Update version via software. Ergonomic and powerfull handpieces with led light, no overheating.

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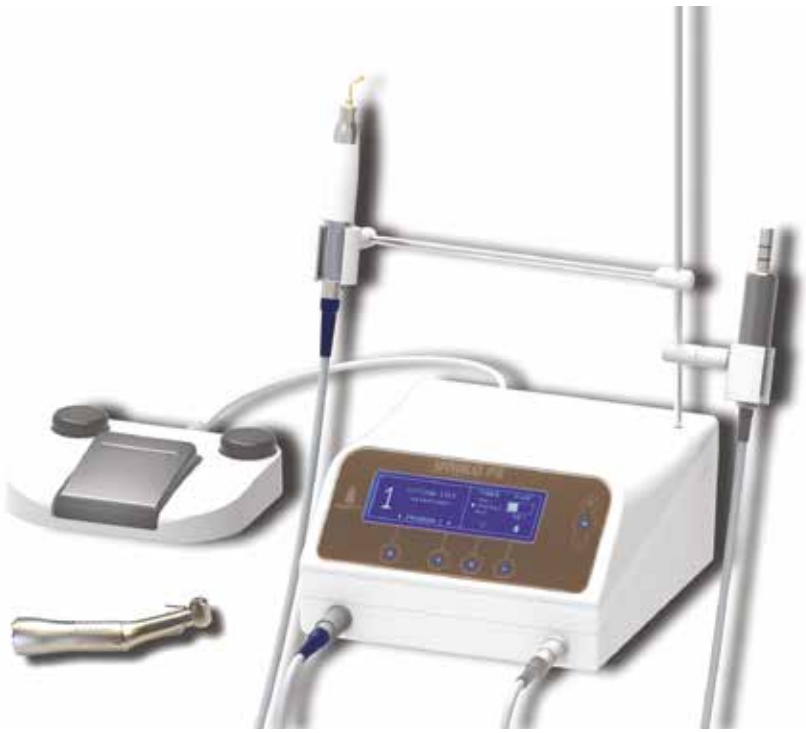

• Metapin

Titanium membrane tacks

The membrane tacks METAPIN are made out of Titanium in order to guarantee high resistance and maximum biocompatibility. METAPIN are specifically recommended for the placement of both resorbable and non-resorbable membranes even in areas of the jaw where the bone density is higher.

Product Features
· Unbreakable and unbendable
· Sterile and ready to use
· Single packaged
· Tack placement instrument with precision guide

METAPIN are available in two different lengths: 3 and 5 mm, in a ready-to-use sterile package of 3 tacks each. The sterile packaging improves the safety of the clinical management reducing the time connected to the process of sterilization and cleaning.

Metapin Holder is an autoclavable bone tack placement instrument proposed with a protective cap that must be removed during the phase of pickup,and can be used in order to complete the stabilization process by dabbing on the head of the positioned tack, when required. METAPIN HOLDER features an exclusive precision guide that guarantees an improved level of stability of the tack during the phase of insertion and stabilization, thus allowing a more precise placement and a stronger grip.

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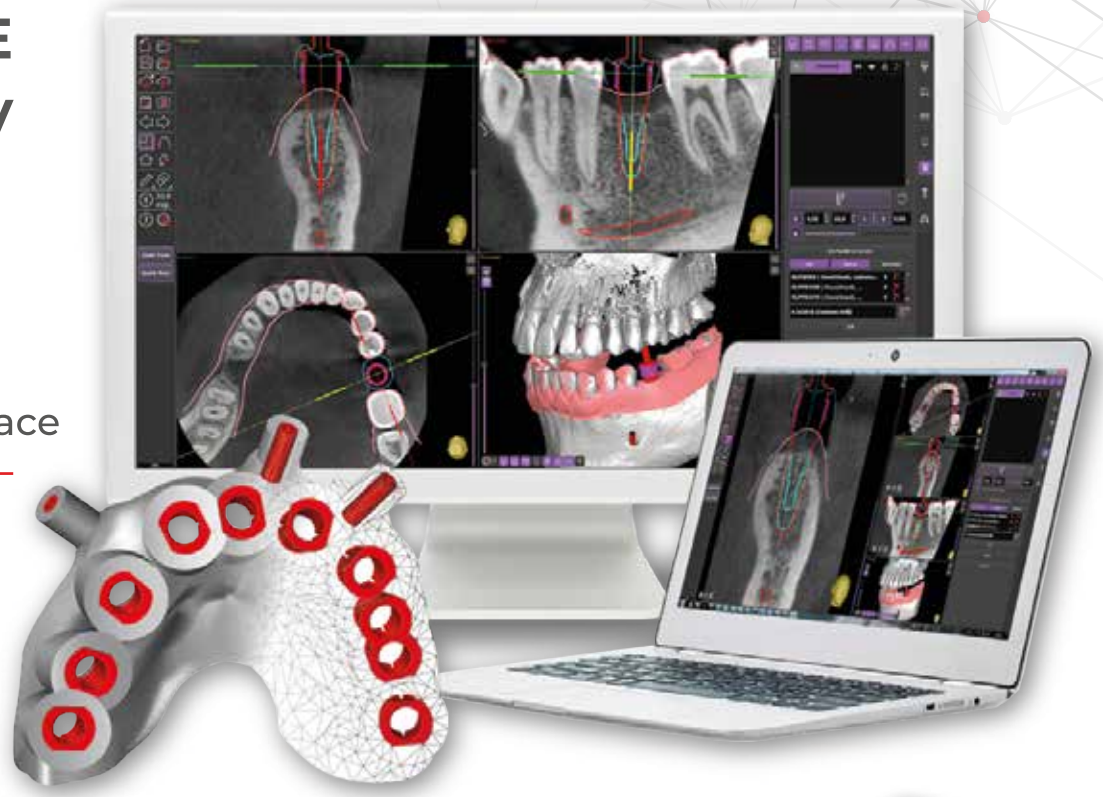

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Dr. G. Rosano

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The innovative design of the Equator attachment provides a superior stability and retention to the prosthesis.

The real revolution offered by OT Equator system is versatility through the use of the same identical attachment for both removable and fixed prosthesis solutions.

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· Manufactured compatible to all implant brands and platforms
· Available in 8 different gingival heights
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· Different elastic retentive caps available
· SMARTBOX system: allow the correction till 50° divergence between implants
· Single castable and threaded titanium attachment systems available
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· FDA – CE – Russia – Canada – Japan – Korea (and more countries) valid patents and registrations

For additional info, please visit: www.rhein83.com
Contacts: direzione@rhein83.it Phone: 0039-051244510

EXPERT OPINION

I have been using Ot Equator attachments (RHEIN 83, Bologna, Italy) for many years. I have performed and published the results of my research on both Locator and OT Equator and have found no differences in clinical and radiographic results, as well as in patients' quality of life. With this in mind, I prefer OT Equator in my daily practice because, by being the smallest attachment available in the market, it allows to obtain a larger space for aesthetics and function.

Dr. Marco Tallarico, DDS, M.Sc. in Oral Surgery
Certificate in Implant Therapy (EAO 2013)
Professor at Department of Surgery, Microsurgery and Medical-Surgical Specialties, University of Sassari, Italy

I've been an Ot Equator attachment user for some time. I appreciate the ease of use and versatility of this retentive system. I use it in prosthetic therapy in combination with 2 endosseous implants to improve the stability of the prosthesis. I also use the Ot Equator attachments in combination with a bar and the Seeger system, when I need to simplify the construction of prosthetic artifacts on divergent endosseous implants, both in removable and fixed prosthesis, by using the attachment as a real multi-unit-abutment (MUA).

Dr. Luca Ortensi, Bologna
Professor at the University of Catania

When we talk about removable prosthetics on implants, we are talking about ball attachments. In recent years research has led companies to produce low-profile attachments (such as OT Equator/Locator). Numerous scientific publications have documented that the maintenance levels and problems of ball attachments compared to low-profile attachments with interchangeable nylon inserts are to the advantage of low-profile ones, such as OT Equator. For some time, I have relied almost exclusively on these myself and I believe I already have a several year follow-up that allows me to say that they are extremely reliable.

Prof. Andrea Borracchini, Siena
M.D. D.D.S. Department of Biotechnology University of Siena, Professor and chair of Prosthodontics

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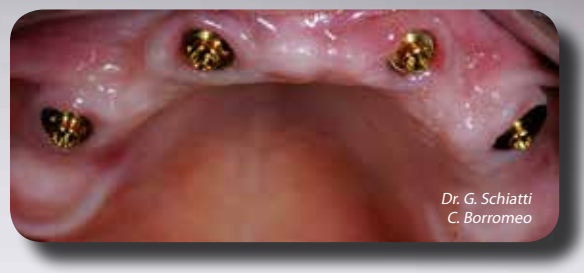

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Mecca - Saudi Arabia
https://makkahdental.com/#

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http://cnridex.com

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Singapore - Singapore
www.idem-singapore.com

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www.bulmedica.bg

14-16 05 2020

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Rimini - Italy

www.expodental.it

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Seoul - Korea, South

http://eng.sidex.or.kr

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FDI 2020 - Annual World Dental Congress

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www.fdiworlddental.org/events/fdi-world-dental-congress

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www.dental-expo.com/dental-expo/eng

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Chennai - India
www.ifea2020india.com

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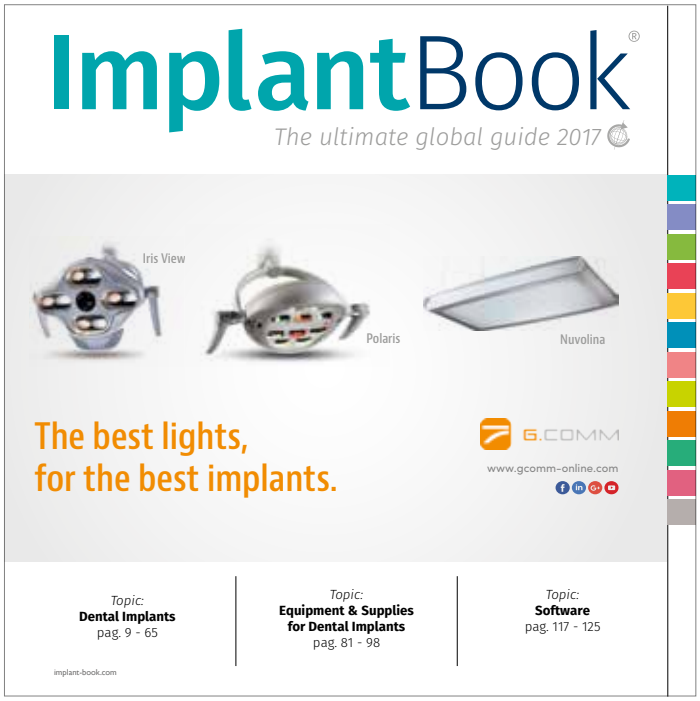

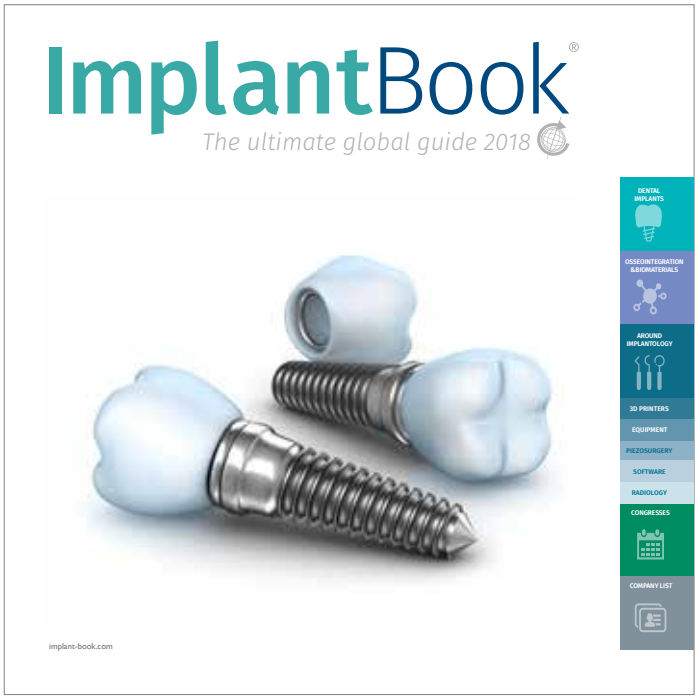

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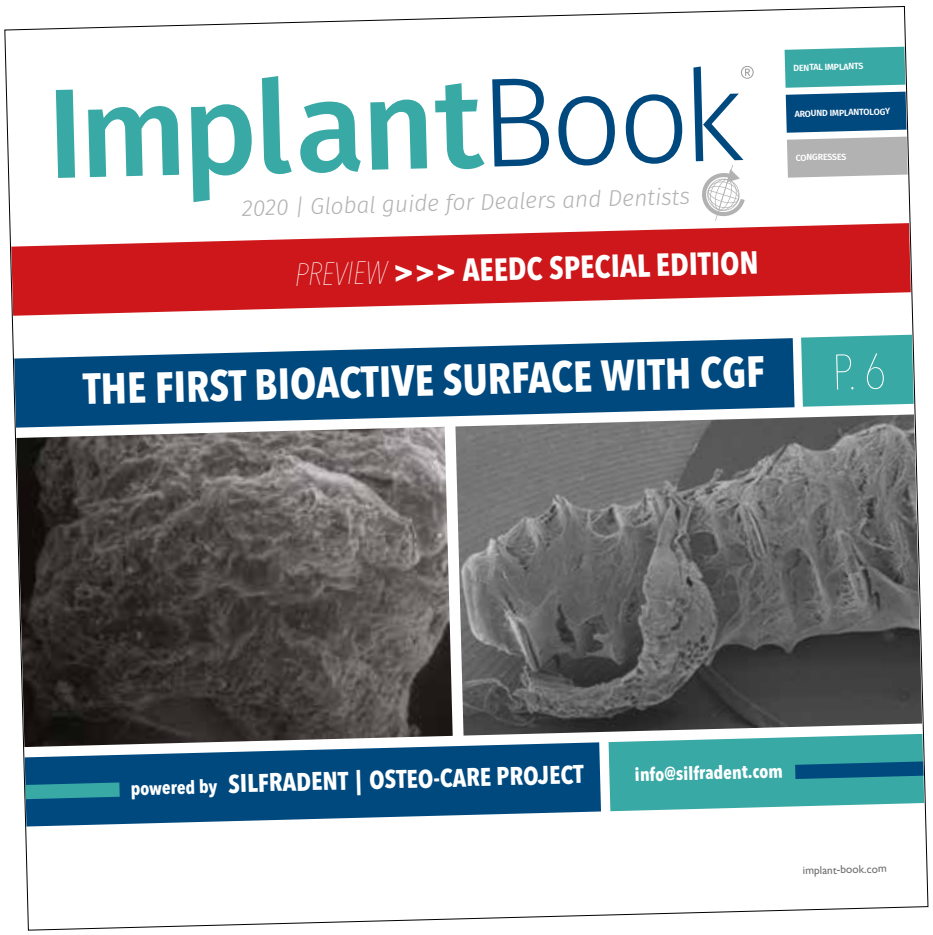

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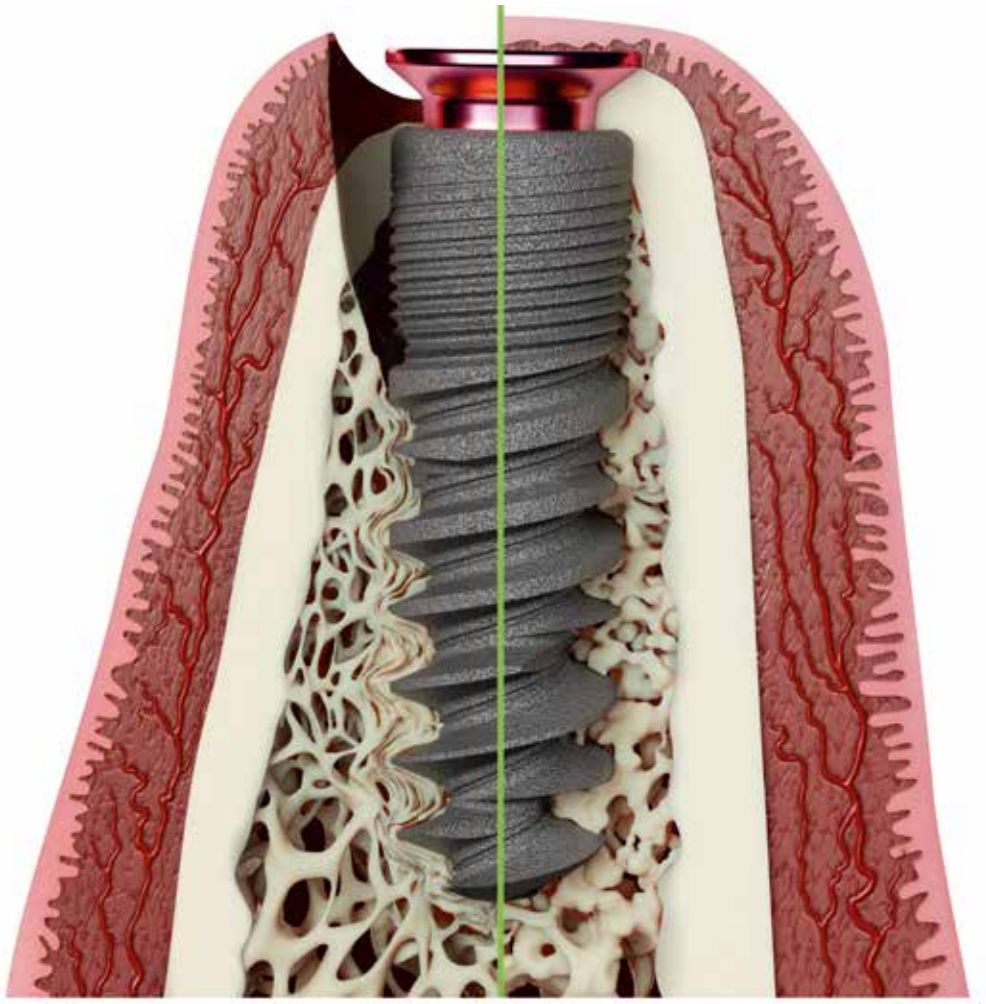

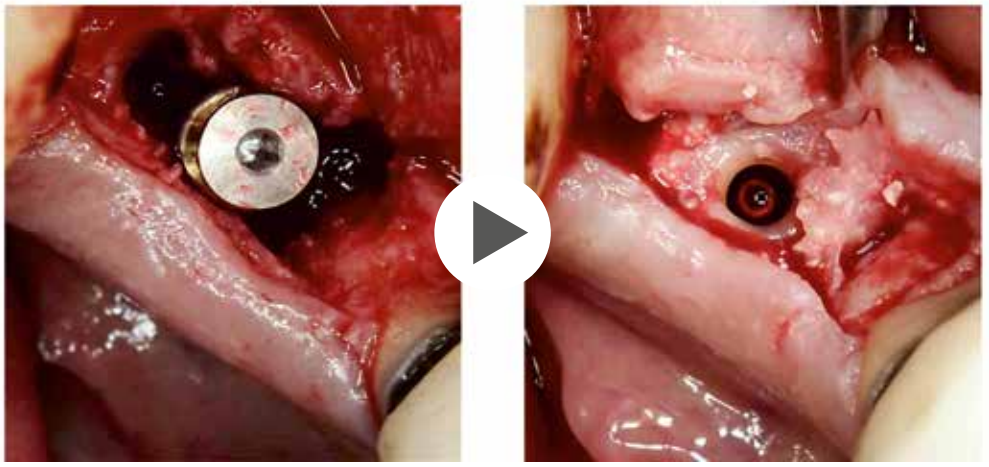

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