Official Show Preview of the ICOI

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Computer planned and guided implant surgery

By Pankaj P. Singh, DDS,
Diplomate ICOI and ABOI/ID

The use of three-dimensional radiography and imaging (Computed Tomography {CT}, Magnetic Resonance Imaging {MRI}) has been used for more than four decades in medicine.

It has aided in increasing the accuracy of identification of vital anatomic structures and the pathologies associated within them.

This advanced technology has also prompted the development of protocols whereby surgical intervention can be planned on three-dimensional virtual computer animation or physical anatomic models. Today, computer-guided and robotic surgery in the most dangerous parts of the body such as the brain, spine and heart are routinely performed with great success and predictability.

In dentistry, the introduction of 3-D radiography more than a decade ago has made it easier for the clinician to identify, study and plan a course of therapy to treat the area of disease or defect with increased precision (Fig. 1).

In addition, the introduction of office-based cone beam volumetric tomographic (CBVT) machines in 1999 came together with the advances in surgical planning software. This software comes either as a third party or as native to the image acquisition and viewing software included with the imaging hardware and has made implant therapy predictable and accurate (Fig. 2).

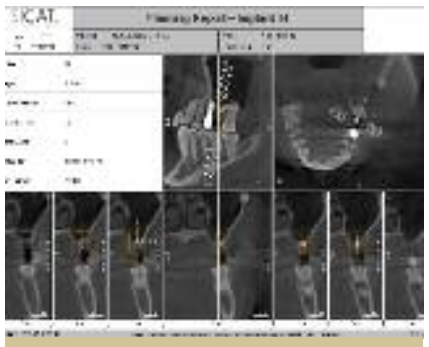

Fig. 1: Cross-section view #14 site demonstrating the need for a sinus lift.

Fig. 2: Galileos by Sirona used to acquire the scan for implant planning with the patient wearing the scan stent.

Traditional model-based surgical guides provide a reasonable estimation of the implant position for the prosthetic rehabilitation. The major limitations of these surgical guides was the surgery was often accom-

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ICOI in Philadelphia

In May, the ICOI and Temple University College of Dentistry will co-host a spring implant symposium at the Downtown Marriott Hotel in Philadelphia.

Event to focus on 'Implant Restorative Science: The Good, The Bad, The Beauitful'

From May 7–9, the International Congress of Oral Implantologists (ICOI) and Temple University College of Dentistry will co-host a spring implant symposium at the Downtown Marriott Hotel in Philadelphia.

The theme for this meeting, as designed by Dr. John T. Green of Dayton, Ohio, is "Implant Restorative Science: The Good, The Bad, The Beautiful." The symposium is also being hosted by ICOI's Component Auxiliary Society, the Association of Dental Implant Auxiliaries (ADIA).

Topics to be covered in the general session are: how to manage the gap; minimally invasive surgery; analysis of tooth size; space size issues; gingival architecture solutions; improvement of doctor/patient/lab communications; implant maintenance issues; i-Cat analysis; treatment for peri-implantitis; ortho-implant realities; immediate provisionalization; CAD/CAM realities; occlusion; abutment selections and complications.

Here are some highlights of the program:

• Dr. William Becker: Implant Restorative

• Dr. Ernesto A. Lee: Implant Supported vs. Tooth Supported

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AAID hails Florida court verdict allowing advertising of bona fide dental credentials

A Florida judge has ruled that a state law restricting how dentists can advertise credentials issued by bona fide professional organizations is unconstitutional and violates the First and Fourteenth Amendments of the U.S. Constitution.

The American Academy of Implant Dentistry (AAID) said today the verdict is a victory for consumers evaluating the qualifications and experience of dentists who perform implant procedures and for practitioners entitled to promote their credentials to the public.

"We are very pleased with this decision recognizing the rights of dentists with bona fide credentials to advertise them to the public without negative disclaimers and offer consumers valid information from which they can evaluate qualifications of dentists in their communities," said AAID President Beverly Dunn, DDS. "Also, the decision noted that AAID and other dental organizations provide substantial training that enhances proficiency and competency and benefits consumers as well."

At issue was a Florida statute preventing advertising of membership in or credentials earned from any dental organization not recognized by the Florida Board of Dentistry (FDB). Florida's dental board only recognizes specialty credentials issued by the American Dental Association (ADA).

Therefore, implant dentists who wanted to advertise their AAID credentials had to include an onerous disclaimer that implant dentistry is not a recognized specialty of ADA or the FDB and that AAID is not a recognized specialty accrediting organization.

The case stemmed from multiple challenges to the constitutionality of the Florida statute by dentists with credentials from AAID, the Academy of General Dentistry and the American Academy of Cosmetic Dentistry. Circuit Court Judge Frank E. Sheffield ruled in favor of the plaintiffs on April 3.

"The Court found that these advertising restrictions were unconstitutional on many grounds. They violated the Florida constitution's guarantee of the right to be rewarded for industry or professional achievement and First and Fourteenth Amendment rights of free speech and equal protection of the law," said Frank. R. Recker, DDS, JD, AAID's chief counsel.

Dunn added that the Florida decision establishes a strong precedent that could form the basis for challenging advertising restrictions in other states, if necessary.

"Demand for dental implants is rising, and more dentists need comprehensive training to become highly skilled at implant procedures," Dunn said. "Attending a weekend course isn't enough. There is a higher level of risk with the procedure if the dentist has limited experience."

AAID offers a rigorous implant dentistry credentialing program that requires at least 300 hours of postdoctoral instruction in implant dentistry, passing a comprehensive exam and presenting to a group of examiners successful cases of different types of implants.

It is one of the most comprehensive credentialing programs in dentistry.

(Source: AAID)

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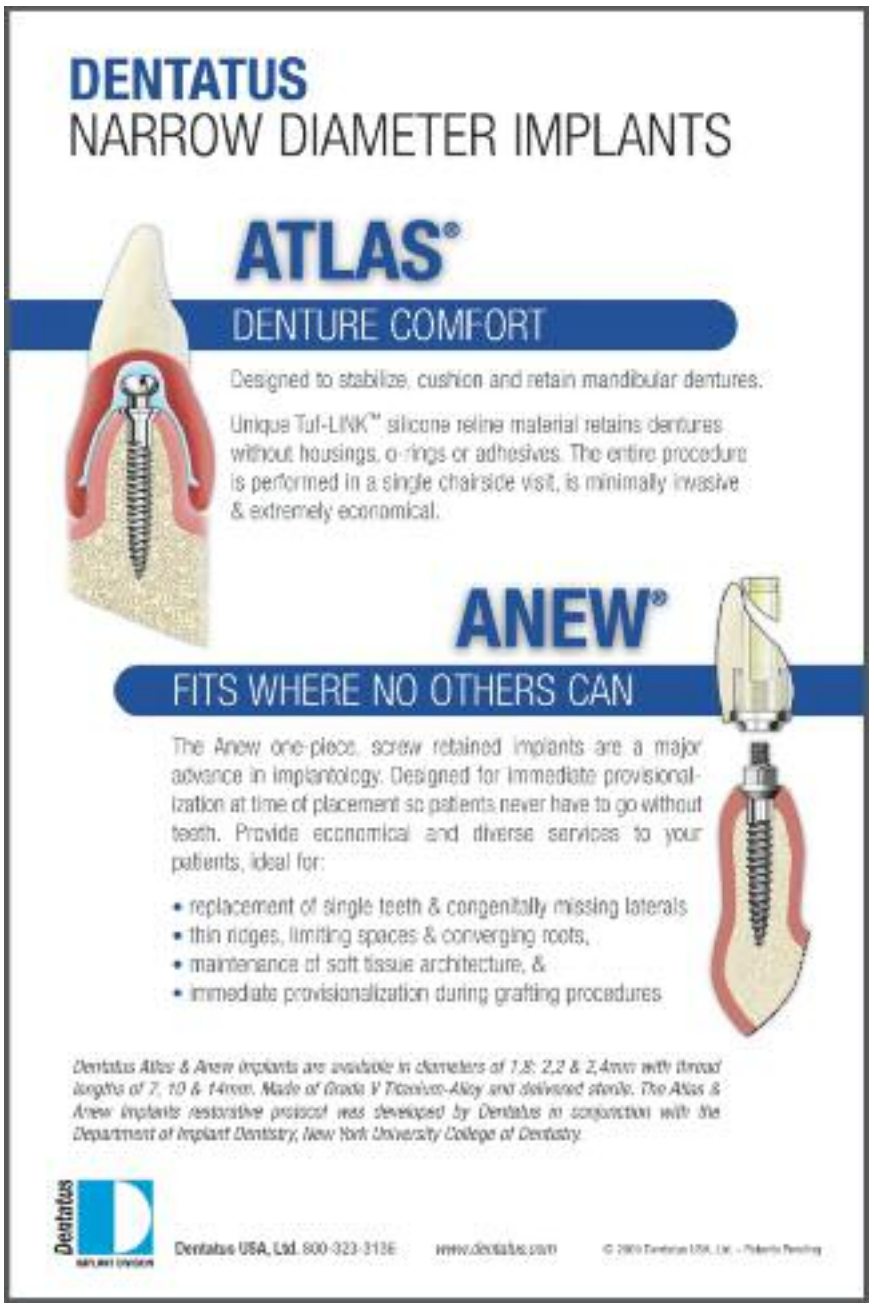

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IT Corrections

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Iacono heads slate of AO's newly-elected officers

Vincent J. Iacono, DMD, Stony Brook, N.Y., was elected president of the Academy of Osseointegration (AO) during the organization's annual business meeting in San Diego. He succeeds former Academy President Steven G. Lewis, DMD, Cincinnati.

Newly elected members of the AO Board of Directors with Dr. Iacono are:

- ***President-elect:*** Peter K. Moy, DMD, Los Angeles;
- ***Vice president:*** Kenneth F. Hinds, DDS, Laguna Niguel, Calif.;
- ***Secretary:*** Stephen L. Wheeler, DDS, Encinitas, Calif., and;
- ***Director:*** Jay P. Malmquist, DMD, Portland.

Vincent J. Iacono

Dr. Iacono is distinguished service professor and chairman, Department of Periodontology, School of Dental Medicine, Stony Brook University. He is also director of the school's Advanced Education Program in Periodontics, and associate dean of Postgraduate Programs.

Iacono co-chaired the academy's landmark 2006 Workshop on the State of the Science of Implant Dentistry. He has served on the Board of Directors since 2000, including terms as AO president-elect, vice president and secretary.

Iacono had been active on many AO committees, including the Council on Research and the Predoctoral Education Forum Committee. He also served on the Osseointegration Foundation Board of Directors. In addition, Iacono is former president of the American Academy of Periodontology (AAP).

Iacono completed his dental degree and earned a certificate in periodontology and oral medicine at Harvard University School of Dental Medicine. He then received a certificate in immunology from the Forsyth Institute, Boston.

With more than 6,000 members in 70 countries around the world, the AO is the world's leading dental implant organization.

Its goal is to advance the field of osseointegrated implants by fostering collaboration between representatives of different dental disciplines — oral surgery, periodontics, prosthodontics and general practice — through clinical and evidence-based research and education.

For more information, visit *www.osseo.org*.

(Source: Academy of Osseointegration)

Prosthodontist William Laney receives 2008 Nobel Biocare Brånemark Osseointegration Award

William R. "Bill" Laney, DMD, MS, of Rio Verde, Ariz., received the Nobel Biocare Brånemark Osseointegration Award during the 2009 Annual Meeting of the Academy of Osseointegration (AO) Feb. 26, at the San Diego Convention Center.

William R. 'Bill' Laney

The award recognizes an individual's impact on, and leadership in, the field of osseointegration. It is presented by the Osseointegration Foundation — AO's charitable wing — and funded by a five-year, $2.5 million donation by Nobel Biocare.

"The foundation is proud to present this award recognizing Dr. Laney for his outstanding educational research contributions, international clinical leadership, and distinguished character," Foundation President Dr. Fraya Karsh, New York, N.Y., explained.

"The Nobel Biocare Brånemark Osseointegration Award is the highest honor bestowed by the foundation. It is fitting that Bill Laney, considered by many to be the pre-eminent prosthodontist of his generation, is this year's recipient," said Dr. Steven E. Eckert, former AO president and editor in chief of AO's journal, The International Journal of Oral & Maxillofacial Implants (IJOMI).

Laney played an essential role in the Academy's founding in the mid-1980s. Members elected him AO's first president in 1986, and he is the only academy member to serve two terms at the helm. He was named AO's first Fellow in 1991, and was presented with the Distinguished Service Award — AO's highest honor — in 2006.

"The academy was a group effort. That said, Bill Laney pulled it together," recalled Dr. Charles L. Berman, co-founder of the study group that would become the AO. "The academy would never have happened without his cohesive leadership."

Laney was also the first editor in chief of IJOMI, a position he held for 20 years.

In addition to his service to AO, Laney also served as president of the Federation of Prosthodontic Organizations, the Academy of Prosthodontics, the American Board of Prosthodontics, the American Academy of Maxillofacial Prosthetics and the American Cleft Palate Association.

Laney earned his dental degree from the University of Oregon Dental School, Eugene, Ore., a certificate in prosthodontics from the VA Medical Center, Iowa City, Iowa, and a master's of science degree from the University of Iowa.

Recipients of the Nobel Biocare Brånemark Osseointegration Award are selected by a committee composed of the immediate past presidents of both the Academy and Osseointegration Foundation, and osseointegration pioneer Dr. Per-Ingvar Brånemark, Göteborg, Sweden, after whom the award is named.

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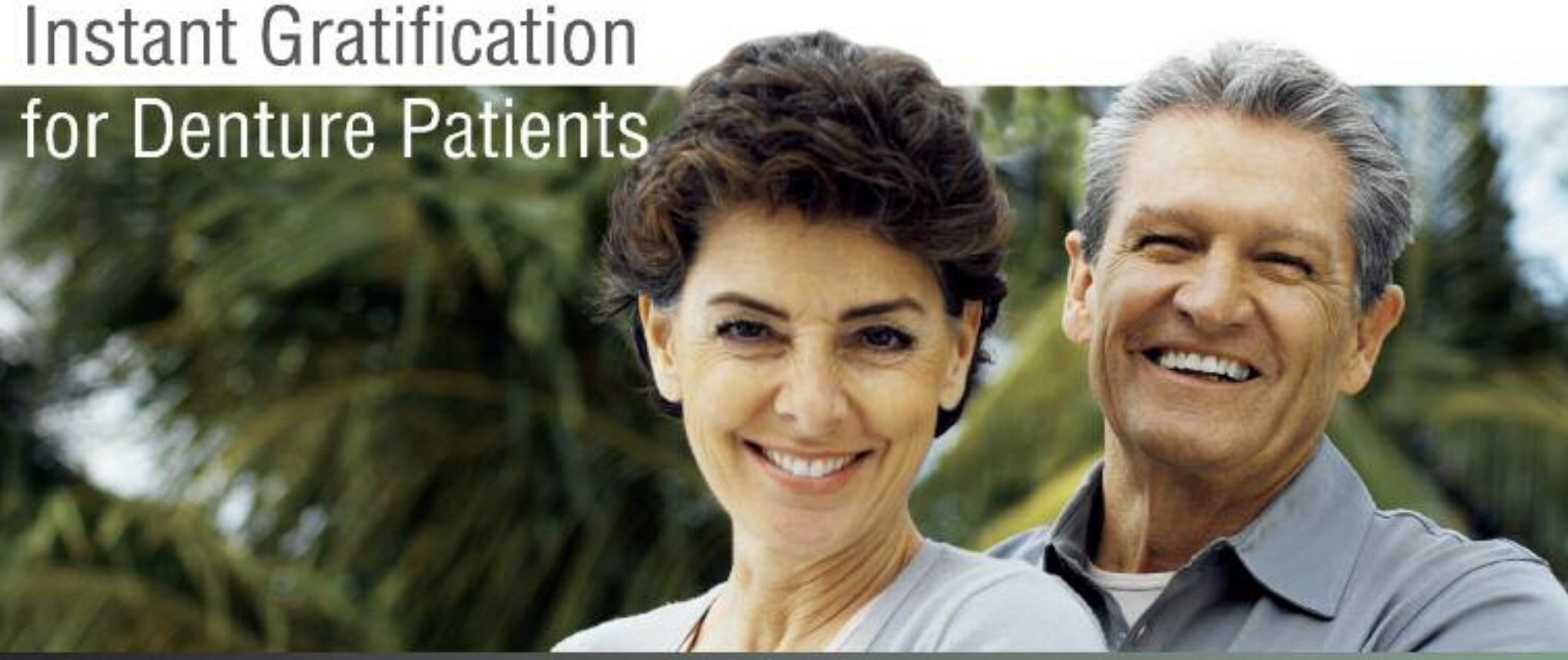

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plished with flaps and the surgeon didn't have an accurate estimation of the hard tissue present, especially the width, until the bone was exposed during surgery. This often led to surprises for both the surgeon and the patient, resulting in implants being placed that were under-engineered for the load or implants that later could not be restored esthetically, leading to compromised results (Figs. 3–7).

Computer-based implant planning and placement allows for creation of an exact replica of the jawbone on the computer screen, allowing visualization of all the vital structures such as nerves, sinuses, nasal floor, proximal teeth and concavities like the one below the mylohyoid ridge in the posterior mandible (Figs. 8a, b). Thus, practitioners can safely avoid these structures when planning and ultimately placing the implants using CAD/CAM generated surgical guides (Figs. 9–11).

With computer-guided placement of dental implants, there is no guesswork or surprises and most surgeries can be performed with a flapless technique (Figs. 12a–c). In case augmentation procedure has to take place, flaps can be reflected to access those sites and the implants provisionalized immediately (Figs. 13a–c). This conservative approach drastically diminishes postoperative pain, recuperation and healing time. The patient leaves the surgeon's office esthetically restored and pleased with the ease at which such a complicated surgery was accomplished.

The guided surgical treatment is based on guided keyhole surgery that is minimally invasive. This reduces pain and swelling considerably for the patient compared to conventional treatment. This technique also reduces the number of appointments and chair time for the patient.

For many patients this means a considerable time and cost savings. The combination of immediate esthetic rehabilitation and function with temporary or final prosthesis ready at surgery radically shortens the overall treatment time and inconvenience to the patient. The computer-based surgical guides allow the implant surgeon to implement the planning with high precision and predictability. The use of a drilling template saves valuable chair time, and is a significant cost savings to the patient. The precision of a drilling template cannot be

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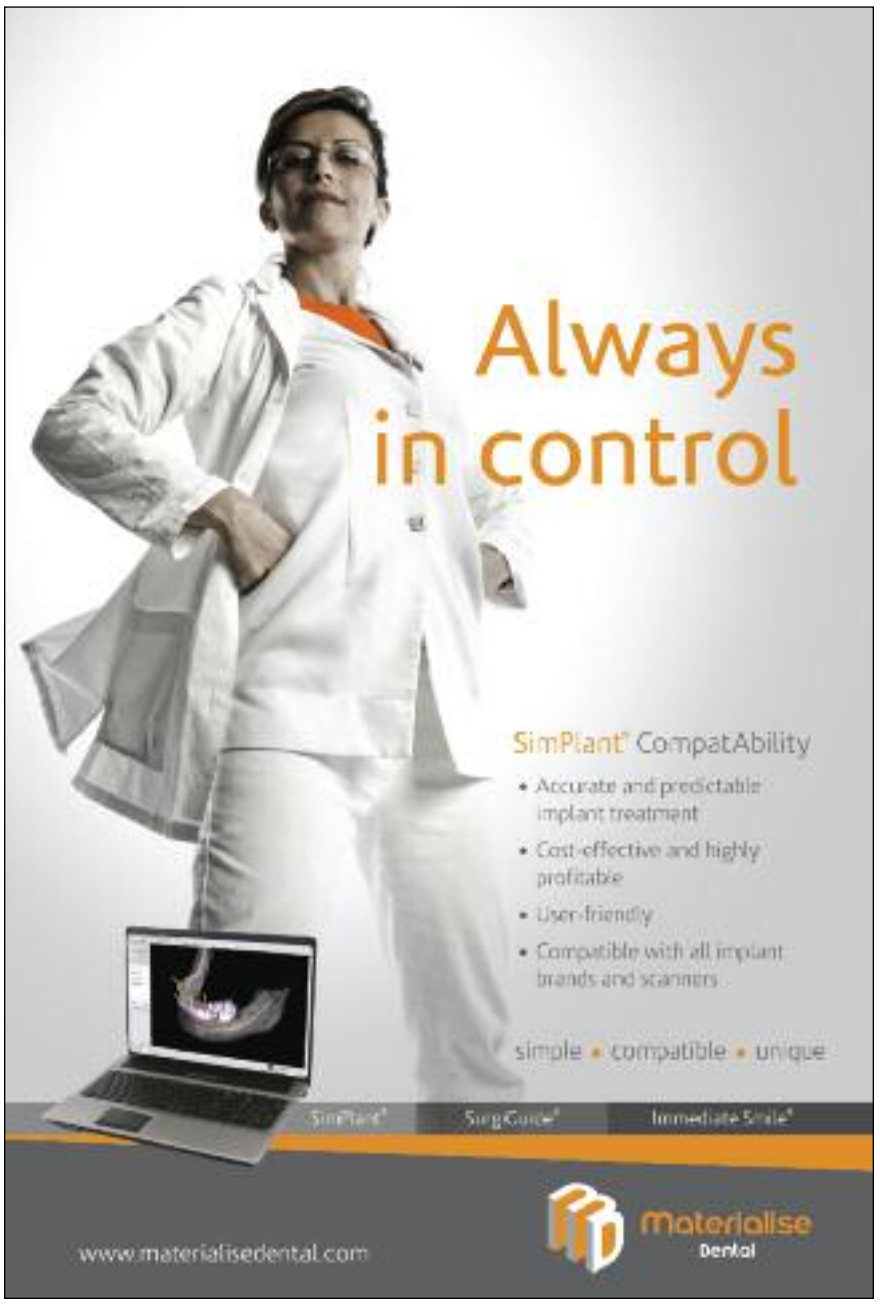

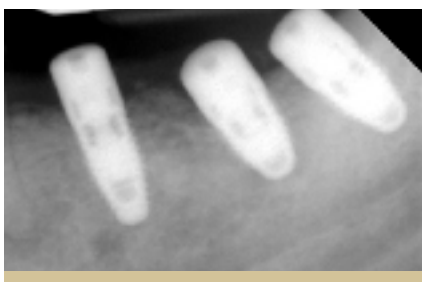

Fig. 3: Three short Nobel Biocare implants in the posterior mandible placed freehand. The patient was referred to our practice for the restoration of these implants.

Fig. 5: Frontal view of the impression copings.

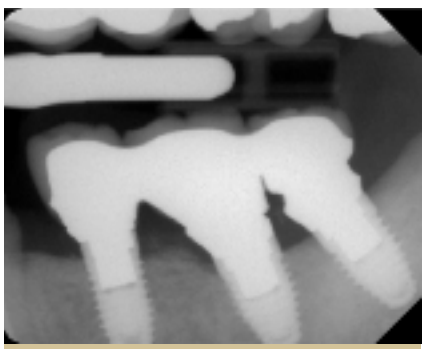

Fig. 7: Radiograph of the finished prosthesis. Because of the severe misangulation of the individual implants as well as in relationship to each other, margins couldn't be closed.

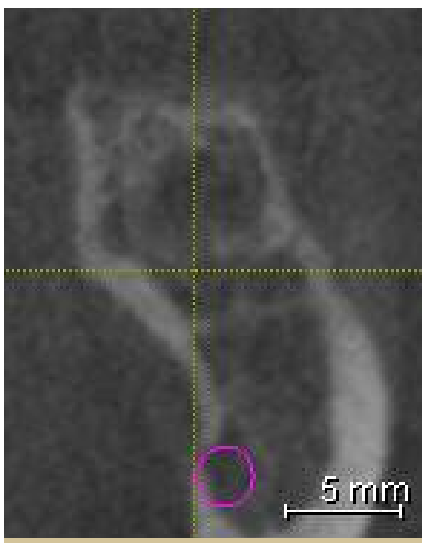

Fig. 8b: Cross section of the posterior mandible showing the mylohyoid ridge and the lingual concavity and the thin buccal alveolar cortex and atrophy.

Fig. 10: Galileos surgical guide for multiple implants for a partially edentulous site.

Fig. 4: Occlusal view of the impression copings attached to the malaligned implants.

Fig. 6: Buccal view of the lingual inclination of the two posterior implants.

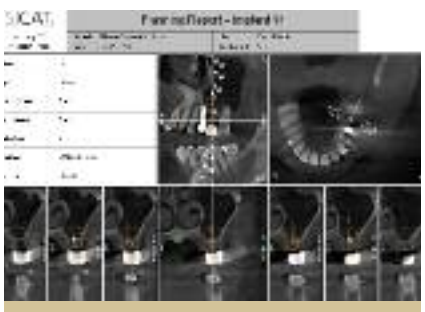

Fig. 8a: Implant planning report generated by Galileos Implant, which can be communicated and shared with the entire implant team as well as with the patient. It effectively communicates the rationale for augmentation procedures and the anatomy involved.

Fig. 9: Surgical Guide fabricated by SiCat of Sirona for a single implant.

Fig. 11: Galileos surgical guide for a fully edentulous lower arch.

Fig. 12a: Flapless, tissue punch approach for placement of a BIOMET 3i Osteotite 5.0X13 mm implant #14 with simultaneous sinus lift.

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Fig. 12b: Periodontal probe used to mark the center for the the tissue punch needed to expose the osseous crest.

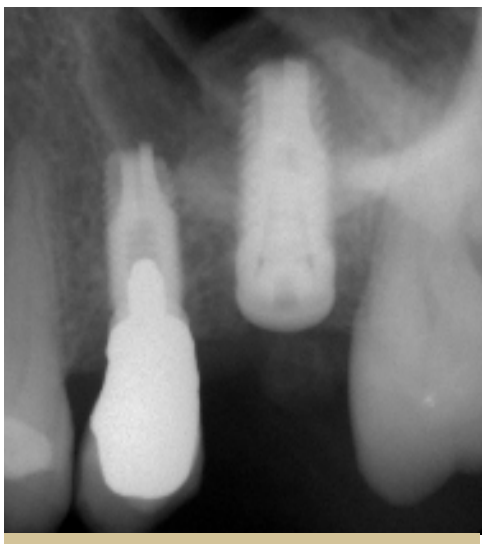

Fig. 12c: Flapless approach to placement of implant #14 and an internal socket sinus elevation with Cerasorb-alloplast grafting material mixed with PRP.

Fig. 13a: Three Camlog implants were used to replace missing teeth #18,19. The placement was guided but flaps were reflected to augment the buccal ridge around the two distal implants using Cerasorb alloplast and Epiguide membrane.

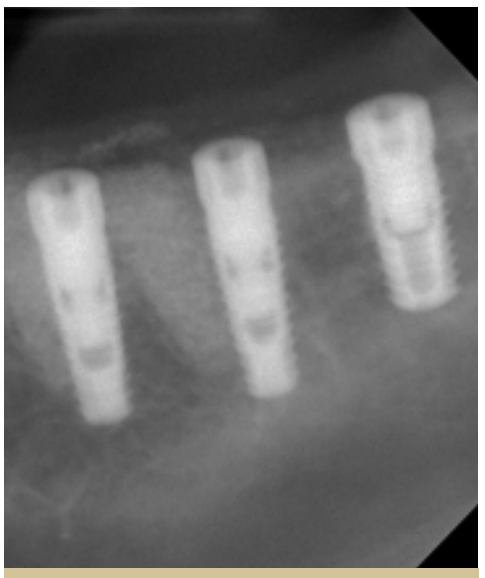

Fig. 13b: Radiograph of the Camlog implants confirming their position.

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Fig. 13c: Four Neoss Implants were placed using a surgical guide; flap was reflected for guided bone regeneration using Cerasorb alloplast and Inion membrane to augment the ridge around the implants.

Fig. 14a: Physical examination to evaluate for prosthetic restorability and health of the surrounding area.

Fig. 14b: Intra-oral radiographs help rule out any pathologies present and preliminary space analysis for implant placement.

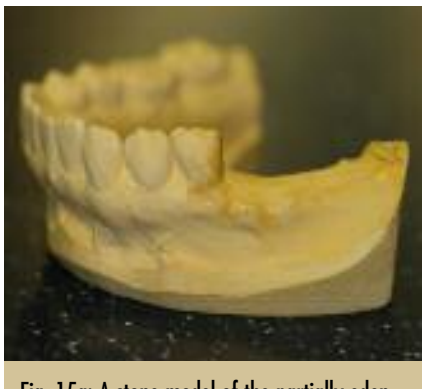

Fig. 15a: A stone model of the partially edentulous mandible.

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reproduced with the freehand method whether the task involves restorations of individual teeth or more extensive and elaborate implant planning.

Obtaining maximum certainty and safety through exact planning and precise implementation with a computer-based keyhole drilling template is both judicious and good patient care.

There are several implant planning software programs available, including: Galileos Implant from SiCat of Sirona, Procera from Nobel-Biocare and SimPlant from Materialise Dental, among others. All systems utilize a double scan technique for the evaluation of the implant site, planning the surgery and fabrication of the surgical guides.

When the patient consents to implant therapy, the restorative or surgical doctor first clinically evaluates the surgical area (Figs. 14a, b) and then refers the patient. If the clinician feels that there is adequate bone volume present to place the implant/implants in the proper position for acceptable esthetic and functional load, then an initial scan is not required.

Once the scan has been acquired, the preliminary implant planning can begin. The scan will aid in determining the amount of bone volume present to achieve primary implant stability, and the grafting required to augment the surgical site at the time of surgery. The implant planning can be easily shared with the entire implant team, including the patient, with the visual aid of the scan and computer. If it is determined from the scan that there is not enough bone volume to place the implant, then significant alteration in the existing anatomy is required prior to implant placement.

Figs. 15b, c: Prosthetic mockup in acrylic mixed with 25 percent barium sulfate of a partially edentulous mandible (left) and a single tooth edentulous site (right).

Figs. 15d, e: Radiographic scan guide for implant planning of a partially edentulous mandible (left) and a single tooth edentulous site (right).

After implant planning, the patient is ready for a workup for the surgical guide fabrication. Study models are made (Fig. 15a) and the prosthetic laboratory will wax-up anatomically accurate teeth or a prosthesis as per the treatment plan. The technician will then convert the wax-up into an acrylic prosthetic replica of the final restoration made of a 25 percent barium sulfate and acrylic mixture and embed the replica in a clear retainer (Figs. 15b, c) attached to a scan template (radiographic or scan guide) (Figs. 15d, e) to be worn by the patient during a scan to be used for the final implant planning (Fig. 16a).

The scan template has fiduciary radiopaque markers that allow for accurate mounting of the stone model with the scan guide into the CAD/CAM milling machine that marks, drills and inserts the key hole sleeves into the scan guide, converting it into a surgical guide (Fig. 16b).

Following the simple process of marking the nerve canal and identifying vital proximal structures, the

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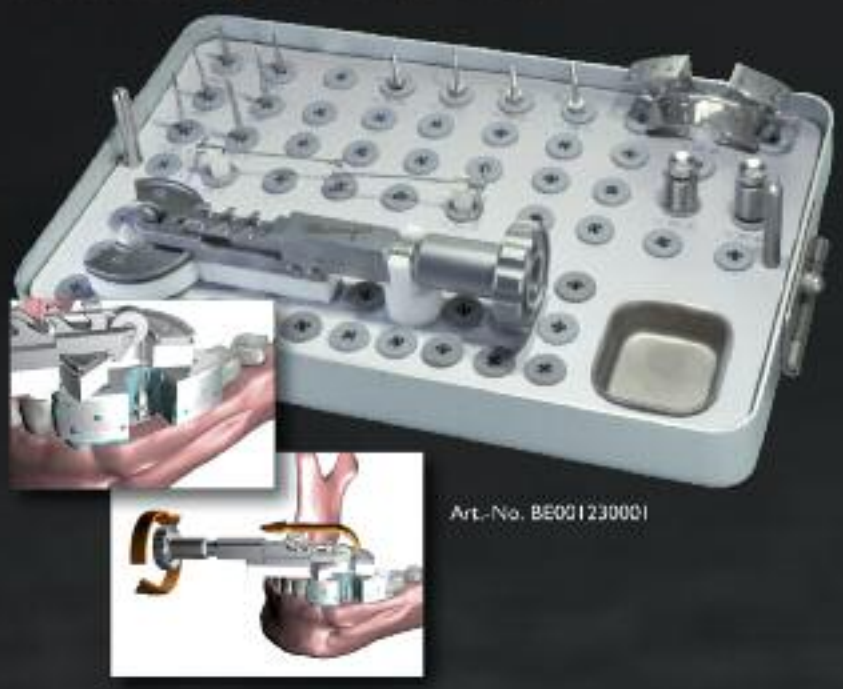

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