

# DENTAL TRIBUNE

The World's Dental Newspaper • Asia Pacific Edition

PUBLISHED IN HONG KONG

www.dental-tribune.asia

No. 10 Vol. 10



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Researchers find filling  
in Neolithic tooth

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Alternative to conventional  
and CAD/CAM techniques

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## British researchers discover the origin of teeth in fish

DTI

**BRISTOL, UK:** The evolutionary origin of dental structures is highly debated among experts. Now, a team of international scientists has found evidence that tooth-like structures were present in the first jawed vertebrates, although it had long been assumed that teeth developed later. The new findings indicate that teeth developed alongside or shortly after jaw structures.

The researchers discovered the origin of both teeth and jaws through studying fossils of *Compagopiscis*, one of the first prehistoric jawed fish. While performing 3-D microscopy, they were able to visualise every tissue, cell and growth line within the fish's jaws, allowing them to study the development of the teeth, said Dr Martin Rücklin, lead author and researcher at the University of Bristol's School of Earth Sciences.

"This technique allowed us to obtain a perfect digital model and very detailed internal views of



Sculptured reconstruction of the placoderm *Dunkleosteus*, a prehistoric jawed fish. (Photo courtesy of Martin Rücklin, University of Bristol, UK)

the fossil without destroying it," said Prof. Marco Stampanoni of the Paul Scherrer Institute, the largest research centre for natural and engineering sciences in Switzerland.

The CT scans demonstrated that some primitive fish possessed jaws with distinct dental

ossifications composed of dentine and bone, the researchers said.

In contrast to the hypothesis that teeth were absent in the first jawed vertebrates and that they captured their prey with scissor-like jaw-bones, the present study suggests that the development of

tooth and jaw structures was intimately interwoven.

The research was conducted by palaeontologists from the University of Bristol in collaboration with experts from the Natural History Museum in London and Curtin University in Australia and physicists from Switzerland. [DTI](#)

## Oral health linked to arthritis

Although previous studies have found a link between rheumatoid arthritis and tooth loss in patients, the complex relationship between the two conditions is not yet understood by scientists. However, the findings of a new study, presented recently at the Fresh Science national finals in Melbourne, Australia, suggest that it might be possible to treat gum disease and severe arthritis simultaneously.

In laboratory tests, the researchers replicated both conditions, which are the result of inflammatory responses in the body, by inducing gum disease and arthritis in mice. They found that animals with gum disease developed significantly worse arthritis. In addition, they observed signs of bone loss in the jaws of mice with arthritis alone and signs of bone loss in the joints of mice with gum disease alone. The researchers are now testing whether treating periodontitis could also help to reduce the symptoms associated with arthritis by researching histone deacetylase inhibitors. [DTI](#)



These Apex Predator leather shoes by Fantich & Young have 1,050 fake teeth glued onto their rubber soles. The art project is a reference to the 2008 financial crisis, according to the British designer duo. (DTI/Photo courtesy of Fantich & Young, UK)

## Body fat is bad for your gums

A new study conducted at the Boston University School of Medicine in the US has revealed that having huge amounts of body fat could play a significant role in the development of periodontitis in men. Male participants with rapid weight gain had more progression of periodontal disease than those who had smaller weight gains. [DTI](#)

## DT Middle East relaunched

The Middle East & Africa edition of DTI's flagship publication *Dental Tribune* has been relaunched in October. Serving a market of 18,000 dental professionals, the edition is published by the Center for Advanced Professional Practices in Dubai, who signed a licence partner agreement with Dental Tribune International in early September. [DTI](#)

## India council under scrutiny

A new report issued by the Comptroller and Auditor General of India has painted a poor picture of how the country's Dental Council is managing dental education. Among other misconducts, it found that a significant amount of dental institutions have not been inspected by the governmental body for years and that fees worth more than US\$1.5 million to be paid by these colleges for the recognition and renewal of certain dental courses are outstanding. In addition, more students were admitted in some of the colleges than actually allowed by the 1948 Dentists Act.

Dental colleges have mushroomed in India over the last few years, now adding 30,000 new dentists annually to an already massive dental workforce of 1.3 million. [DTI](#)



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# FDI apologises for cancelled AWDC in Seoul

DT Asia Pacific

**Hong Kong:** At the general assembly meeting of this year's Annual World Dental Congress (AWDC) in Hong Kong, FDI President Orlando Monteiro da Silva expressed his regrets for the circumstances that led to the cancellation of the organisation's 101<sup>st</sup> AWDC in Korea next year. He disclosed that the FDI would welcome the option of organising the congress in Seoul in the near future.

"We apologise for any misunderstanding that may have arisen during complex negotiations and renegotiations with regard to holding the AWDC in Seoul in 2013," da Silva said at the meet-

ing. "It was external reasons and circumstances that were not in the control of either the FDI or the Korean Dental Association that led to the decision that we would not be able to host our next congress in Seoul in 2013 as originally planned," he added.

As announced earlier this year by the federation, the congress in Seoul had to be cancelled owing to the difficult economic situation in the country. Nevertheless, the president expressed confidence in the federation's strong partnership with the Korean Dental Association.

Furthermore, da Silva announced the introduction of a new model for the congress,

which will bring much more transparency and clarity in the decision-making process and will offer the association the opportunity to host a congress in the near future.

The 2013 congress will be held by the Turkish Dental Association instead. With the theme "Bridging continents for global oral health", the event will take place at the Istanbul Convention and Exhibition Centre from 28 to 31 August. The organisation is looking forward to bringing dentists from five continents together in the city of Istanbul for the first time, said the association's president, Prof. Taner Yücel, at this year's FDI AWDC in Hong Kong. [\[1\]](#)

# Dentists in Malaysia disagree with dental bill

DT Asia Pacific

**PUTRAJAYA, Malaysia:** A new bill aimed at restructuring the practice of dentistry in Malaysia has been met with opposition by dental professionals nationwide.

In a recent interview with the tabloid newspaper *The Malay Mail*, the President of the Malaysian Private Dental Practitioners' Association (MPDPA),

Dr Malliga Vadiveloo, said that the draft recently proposed by the country's dental council does not make sufficient distinction between qualified dental surgeons and therapists.

The bill is also under scrutiny for making it too easy for foreign practitioners to obtain temporary licences to practise and preventing general practitioners from performing speciality treat-

ments like orthodontics and dental implantology. The MPDPA and other dentist organisations called upon the council to put the bill up for further discussion, which they claim was drafted without sufficient input from the dental profession.

Proposed by the Malaysian Dental Council in October, the new bill is to replace the 1971 Dental Act. [\[1\]](#)

## International Imprint

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The World's Dental Newspaper - Asia Pacific Edition

### Published by Dental Tribune Asia Pacific Ltd.

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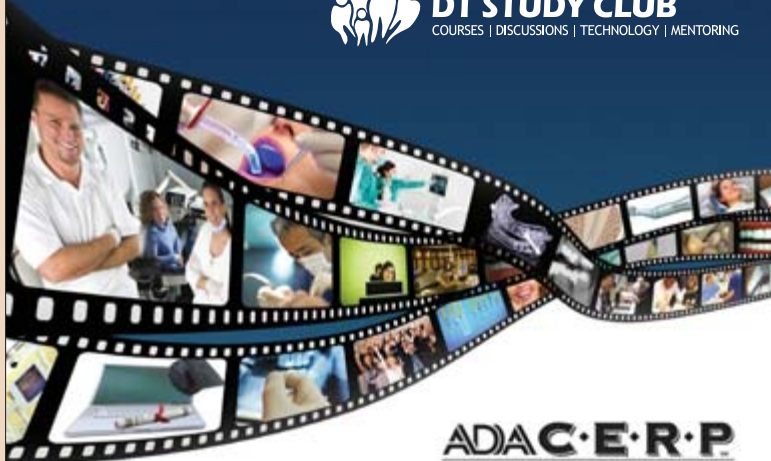
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# Petition for dental scheme in Australia receives support

**CANBERRA, Australia:** New plans by the Labor government in Australia to shut down its Medicare dental scheme have encountered opposition among patients nationwide. In an online petition, thousands have signed to keep the scheme in place, the advocacy organisation GetUp! has reported.

Labor Minister for Health Tanya Plibersek recently put an

end to the Medicare Chronic Disease Dental Scheme by signing a ministerial determination in August that will prevent new patients applying to the programme. She said that instead the government will provide AUS\$4 billion for a new programme that will be implemented in 2014 and target children. Additional funding of AUS\$1.3 billion will also be provided to state-run public dental clinics.

Patients who already have referrals to see a dentist from their GPs have until the end of next month to complete their treatment, according to the ministry.

The Medicare Chronic Disease Dental Scheme allowed patients with chronic illnesses and complex care needs to claim benefits for dental treatment of up to AUS\$4,250 (US\$4,400).

Controversy related to the scheme arose last year, when the government launched investigations into a number of dental practitioners who were alleged to have failed to comply with administrative requirements.

Dental experts have warned that ending the programme without an immediate replacement could add more patients in need of treatment to the already

extensive waiting list in public hospitals. They claim that millions have benefited from the scheme since it was implemented by the Howard government in 2007.

According to the Labor government, expenses for the scheme have accumulated to such an extent that it is now costing ten times more than originally projected. [D](#)

AD

## Faster voice recovery

**SINGAPORE:** Singaporean scientists have designed a new system to help patients who have undergone larynx removal to speak again in a single surgery. In comparison with existing methods, their invention not only reduces the number of surgical steps but also increases accuracy of placement of a voice prosthesis and allows for immediate voicing.

Conventionally, various surgical steps are involved in the insertion of a voice prosthesis. Doctors need to make a small puncture in the wall between the trachea and the oesophagus, while, at the same time, a guide-wire is inserted into the fistula to prevent the creation of a false passage. Two dilators are then inserted to widen the fistula.

Previously, a temporary rubber tube was placed into the fistula and the voice prosthesis was inserted about two weeks later, explained the researchers. They think, however, that their newly developed technique can reduce the time needed to restore the patient's ability to speak to ten minutes after the initial procedure. It offers a one-step solution, reducing the complexity of the surgery and saving patients discomfort and money, said Dr David Lau, the project's consultant ENT surgeon at Raffles Hospital in Singapore.

"Until now, good sizing of the prosthesis was achieved through trial and error," said Dr Chui Chee Kiong, project leader and assistant professor at the National University of Singapore's Department of Medical Engineering. "We have merged all the steps into a single procedure. Our system ensures an immediate snug fit of the prosthesis in the passageway created between the trachea and the oesophagus."

Owing to tissue change and wear, voice prostheses need to be changed, which entails fitting them each time. "Our invention offers patients a more fuss-free system, reducing time and discomfort," added Chng Chin Boon, a research engineer at the university. [D](#)

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# Dear reader,



Daniel Zimmermann  
DTI

With new licence partners from Australia & New Zealand, South Korea and Vietnam having joined our publishing network in the last two months, DTI's reach into the Asia Pacific region has been extended to markets comprising over 50,000 dental professionals. I would like to welcome our new friends on behalf of our worldwide readership and encourage you to follow their future efforts to provide the latest news from dentistry to their respective national dental communities.

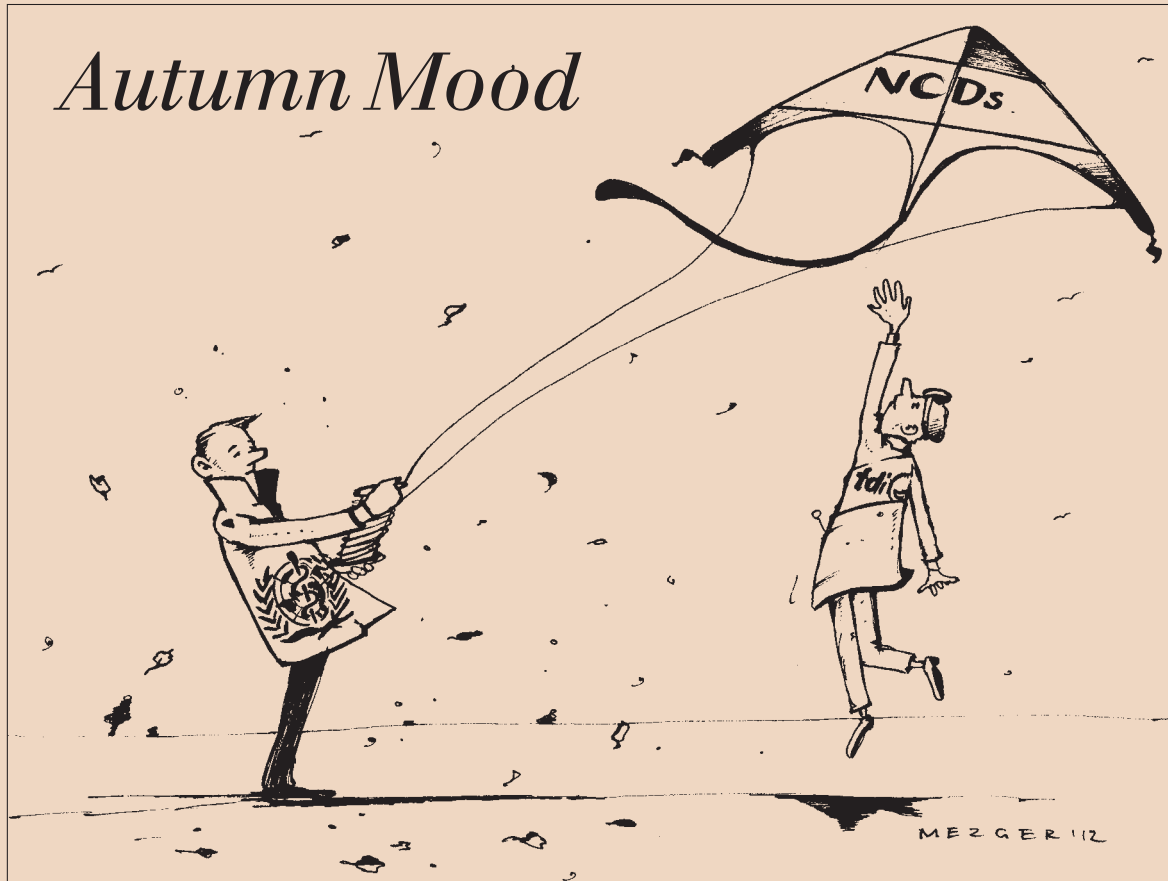
We also announce our support to the Center for Advanced Professional Practices, our new partners from Dubai, who did not only recently agree to publish our Middle-East & Africa edition but successfully held their first ever CAD/CAM and computerized dentistry congress for the Asia Pacific region in Singapore. If you want more information about this novel and interesting event, please read our review on page 10. [DTI](#)

Yours sincerely,

Daniel Zimmermann  
Group Editor  
Dental Tribune International

Dental Tribune welcomes comments, suggestions and complaints at [feedback@dental-tribune.com](mailto:feedback@dental-tribune.com)

## Autumn Mood



# Growing a tooth in the future?



Irma Thesleff  
Finland

Hopes of growing teeth have been supported by the occurrence of supernumerary teeth in the jaws, as well as fully developed teeth in teratomas. The issue of tooth bioengineering has been taken up again more recently, as scientific breakthroughs in the fields of genetics and developmental biology have led to a completely new level of understanding about how teeth develop. Basically, tooth formation is regulated by a chain of interactions between two different tissues, epithelium and mesenchyme. And importantly, we

actually know that the language that cells and tissues use for communication consists of defined signalling molecules.

Currently, the most realistic scenarios for tooth regeneration involve the generation of teeth from stem cells with the capability to form teeth. The technology would be based on traditional experiments that demonstrated more than 40 years ago that proper teeth form when separated epithelial and mesenchymal tissues from mouse embryonic tooth germs are recombined and cultured as transplants.

The question of the origin of cells for human tooth bioengineering is still unanswered. Adult human teeth do contain stem cells but they may not pro-

vide a suitable source. Therefore, it is likely that non-dental cells will have to be reprogrammed for the purpose of clinical tooth regeneration. In addition, there are several other remaining challenges such as the issues of tooth size, tooth identity, crown shape, and composition of the mineralised tissues. The creation of functional roots presents perhaps the biggest challenge that needs to be addressed before bioengineering of teeth will be feasible. [DTI](#)

### Contact Info

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# Thoughts on CBCT



Prof. Keith Horner  
UK

CBCT is the most significant development in dental imaging during the last 25 years. Concerns have been raised, however, over the radiation doses, which are usually higher than those of conventional dental radiography. Recent reviews indicate that doses from CBCT are typically an order of magnitude greater than those from conventional dental radiography. The health risks from such exposures are also proportionately higher.

The foundations of radiation protection of patients are justification and optimisation. Justification embodies the principle that all exposure to X-rays should give a positive net benefit to the patient. Optimisation is the principle that all exposure should be as low as reasonably achievable. So, where do we go from here?

When we use CBCT, we should never just "press the button" using a standard exposure for everyone, but we should adjust the exposure factors to a level that gives adequate image quality and use the smallest appropriate field of view. These simple steps will reassure our patients that we have their best interests at heart; that is what we really want – isn't it? [DTI](#)

### Contact Info

Keith Horner is Professor of Oral and Maxillofacial Imaging at the University of Manchester's School of Dentistry. He can be contacted at [keith.horner@manchester.ac.uk](mailto:keith.horner@manchester.ac.uk).

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**PROMEDICA**

# World Dental Federation faults WHO plans on noncommunicable diseases

Daniel Zimmermann  
DTI

GENEVA, Switzerland: The FDI World Dental Federation has issued concerns about a number of action documents recently made public by the World Health Organization with regard to non-communicable diseases (NCDs). In a statement released on its website, the dentists' organisation criticised the documents for not paying sufficient attention to oral diseases, which it says should be classified as a key NCD by the WHO, along with cancer, diabetes, as well as cardiovascular and respiratory diseases.

In a circular note, the FDI also called upon its members to contact their respective national health officials immediately to ensure that the issue of oral health will be included in the upcoming WHO consultations on the plan, as well as the organisation's next executive board meeting in January. According to the WHO sources, the draft is to be discussed during an informal consultation in Geneva in early November, which will involve member states and several UN agencies.

Published on 12 October, the paper "Global action plan for the prevention and control of noncommunicable diseases 2013–2020" identifies the threat of NCDs to achieving health-related development goals in low- and middle-income countries and provides recommendations on addressing the situation over the next seven years.

NCD's currently account for 36 million deaths worldwide each year with the majority to be occurring in less developed countries, according to Geneva-based organisation.

While admitting to current constraints of the WHO, the FDI said in its statement that the leadership role of the WHO is essential to keeping oral health a priority in the fight against NCDs. It stated that it had addressed a formal request to the organisation for the inclusion of oral health in its next general programme of work, which will determine the WHO's expenditure and goals over the next five to six years.

"WHO recognition of oral disease is essential to support and consolidate the significant role the dental profession plays in the prevention and control of NCDs," FDI President Orlando Monteiro da Silva told *Dental Tribune*. "WHO is a governmental organization so, while FDI can monitor and advise, governments alone are in a position to change WHO strategy and policy. That is why we are calling upon our member dental associations to contact their national government and ensure the oral health message is communicated within WHO."

The FDI has been lobbying heavily for the inclusion of oral diseases in the WHO's list of NCDs for years. In February 2011, for example, Executive Director Jean-Luc Eiselé spearheaded a submission by the World Health Professions Alliance (WHPA) during a civil

society hearing at the UN headquarters in New York, stating that oral diseases share common risk factors with existing NCDs and have a major impact on society.

The federation is also offering an NCD toolkit for both

patients and health professionals, which features a health improvement card, among other things, as part of the larger NCD campaign conducted in partnership with the WHPA. [DTI](#)



WHO's Global Action Plan on NCD's pays only lip service to oral health, according to the FDI.

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(DTI/Photo Daniel Zimmermann)

A record number of companies exhibited at the 20<sup>th</sup> EAO congress.

AD

# EAO celebrates successful anniversary event in Copenhagen

20<sup>th</sup> congress of the European Association for Osseointegration presented latest concepts and developments in implant dentistry

DTI

COPENHAGEN, Denmark: Celebrating the achievements of implant dentistry in the last

20 years, thousands of clinical specialists from Europe and around the globe recently gathered at the Bella Center exhibition and congress venue in the

Danish capital for the annual scientific congress of the European Association for Osseointegration (EAO). Following a successful event in Athens last year, the con-

gress event more than 2,300 scientists and clinicians involved in implant and restorative dentistry over the course of four days.

Besides an extensive scientific programme covering topics like imaging and factors of implant loss, the event saw a record number of companies exhibiting established clinical solutions and a number of new products, including dental implants and sophisticated surgical equipment. Market leader Nobel Biocare, for example, had its new OsseoCare Pro drill motor, which can be operated entirely through Apple's iPad tablet computer, on display. Italian manufacturer mectron presented its multipiezo pro device, which can be used for ultrasonic implant cleaning, in Copenhagen.

New implant devices were exhibited by MIS Implants, MegaGen and BioHorizons.



Members of the Tivoli Boys Guard entertaining attendees of the opening ceremony.

Held for the 20<sup>th</sup> time, the EAO's latest annual meeting looked back on various issues related to implant dentistry from the last two decades. Acknowledging the progress being achieved in the field, a Saturday morning session titled "Future perspectives of implant dentistry" discussed future prospects of bioactive implant surfaces and the use of computer-guided implant planning, among other topics. For the first time, a session organised by members of the EAO's Junior Committee also presented new revolutionary ideas that could shape implant dentistry in the years to come.

Having originated from a clinical meeting by implant specialists in the late 1980s, the EAO is today an established authority and one of the most important scientific and clinical forums for implant dentistry in Europe. It is comprised of renowned clinicians and researchers from around the world. With more than one third of visitors coming from regions outside the continent, its annual scientific congress has recently gained more relevance internationally. □

## 18<sup>th</sup> Dental South China 2013

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# Stone-age dental filling identified

Robert Selleck  
DT America

**SAN FRANCISCO, USA:** A team of Italian and Australian researchers appears to have found physical proof that restorative dentistry dates to the Stone Age. The researchers identified traces of a dental filling made of beeswax in a Neolithic human tooth discovered in Slovenia, and they are saying it may be the “earliest known direct evidence of [a] therapeutic-palliative dental filling.”

The research findings were published Sept. 19 in PLoS ONE, the peer-reviewed, open-access journal, accessible online at [www.plosone.org](http://www.plosone.org).

The team acknowledges in its paper that it cannot be absolutely certain that the beeswax filling was placed in the tooth in an effort to address a dental problem the individual was experiencing while alive. But the paper identifies that as being the most likely of the possible scenarios that would explain the presence of the substance on a worn-down tooth that otherwise would have had exposed dentin.

“The tooth probably became very sensitive, limiting the functionality of the jaw during occlusion. The occlusal surface could have been filled with beeswax in an attempt to reduce the pain [by] sealing exposed dentin tubules and the fracture from changes in osmotic pressure (as occurs on contact with sugar) and temperature (hot or cold relative to the oral cavity),” the team wrote.

The piece of jawbone with five teeth still attached was discovered long before the team’s research was conducted. It was excavated from a cave wall near the village of Loche, Istria, in Slovenia and was initially dated based on associated fauna remains, which traced to the Upper Pleistocene era.

The team reported that the specimen was considered to be “one of the most ancient anthropological remains from the northern-Adriatic area.” But the find had never been subjected to detailed analysis until the researchers secured permission to study the mandible using state-of-the-art scanning technology and radiocarbon dating techniques.

Permission was granted by Italy’s Natural History Museum of Trieste, to whom the original finders had donated the specimen. The mandible, determined to be from a male who died in his 20s, was described by the team as, “the left portion of an isolated adult mandible bearing a canine, two premolars, and the first two molars.”

The 12-person team of researchers from university and governmental facilities in Italy and Australia used synchrotron radiation computed micro-

tomography, accelerator mass spectrometry radiocarbon dating, infrared spectroscopy and scanning electron microscopy to separately analyse the tooth, bone and filling material.

Based on the radiocarbon analysis, the mandible was dated to an age range of 6,655–6,400 years Before Present and the filling 6,645–6,440 years BP.

The researchers listed several previously known examples of ancient dentistry but said there was no known published documentation of the use of “therapeutic palliative substance in prehistoric dentistry.” The research team also referenced documentation on the use of beeswax as a binding agent in antiquity—and explained the substance’s ability to remain pre-

served for long periods of time because of its “extreme chemical stability.” The team’s conclusion: “In this emerging framework of ancient dental therapeutic practices, the finding of a human partial mandible associated with contemporary beeswax, covering the occlusal surface of a canine, could represent a possible case of therapeutic use of beeswax during the Neolithic.”

In a note regarding the funding of the research project, the team wrote, “This work is part of the ICTP/Elettra EXACT Project (Elemental X-ray Analysis and Computed Tomography) funded by Friuli Venezia Giulia (Italy). The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.”

The team’s paper is titled, “Beeswax as Dental Filling on a Neolithic Human Tooth.” [DOI](#)

AD

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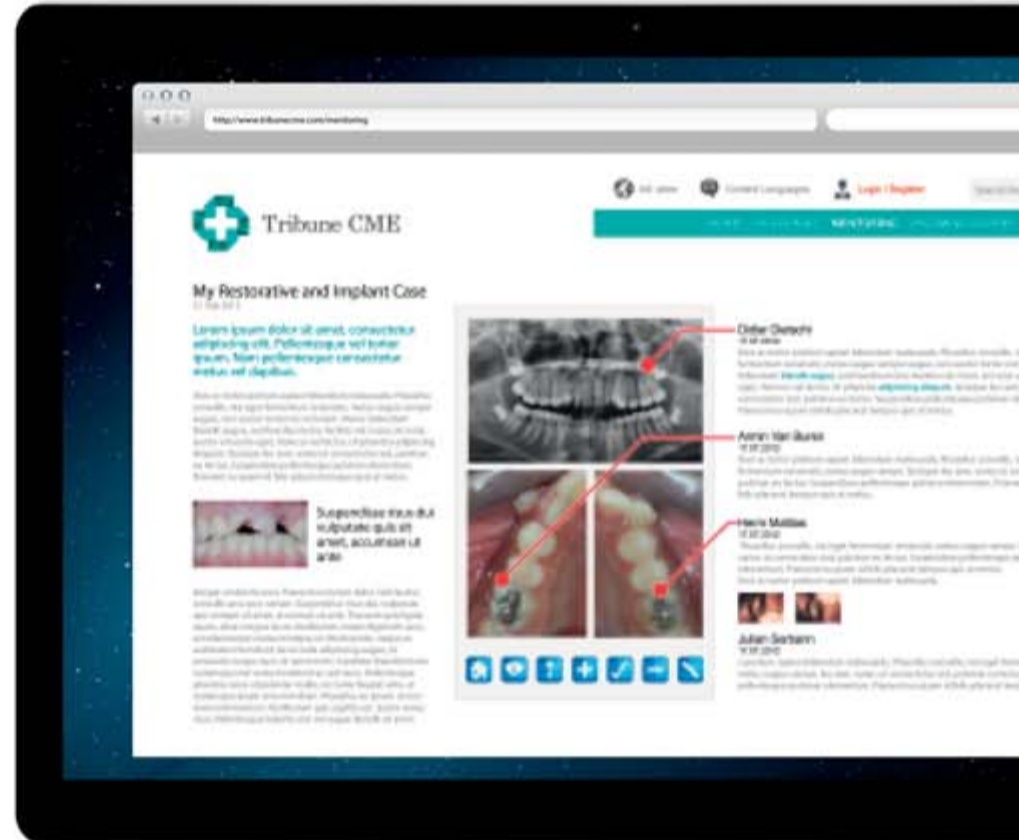
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# Maxillent brings sinus lift implant to Hong Kong

DT Asia Pacific

**HONG KONG:** Maxillent has recently signed an exclusive agreement involving its iRaise dental implant with medical device distributor Pioneer Richteeth Medical Distribution. Under the terms of the contract, the Chinese company will be allowed to market and sell the device in Hong Kong's growing dental implant market, *Dental Tribune Asia Pacific* has learned.

Shanghai-based Pioneer already distributes a number of products from different dental

manufacturers in China, including those from German dental lab supplier Wieland Dental. Maxillent CEO Gideon Fostick said that the company was selected owing to its expertise and reach in Hong Kong and other Asian markets. Other details were not disclosed.

The deal is Maxillent's first attempt at gaining a foothold in

Far East, where an increasing number of dental practitioners have begun to offer implants as a treatment option. According to a survey conducted by researchers at the University of Hong Kong's Faculty of Dentistry, more than 60 per cent of dental practitioners in the city were already practising implant dentistry in 2006. Up to now, the market has been shared by West-

ern manufacturers like Nobel Biocare and Straumann, which have been rivalled by low-cost providers from South Korea in recent years.

Maxillent's iRaise dental implant features an internal channel that allows clinicians to inject fluids directly through the implant into the sinus, a novel procedure that significantly reduces

complications, as well as chair and recovery time, compared with traditional sinus lift procedures, the company said.

In addition to iRaise, Maxillent currently distributes a tapered implant under the iSure brand, as well as prosthetics, surgical instruments and bone grafts, in Israel and several European markets. [DT](#)

AD

## Cortex announces new implants

DTI

**COPENHAGEN, Denmark:** At the EAO annual scientific congress, the Israeli company Cortex recently showcased its whole range of products and new ideas for the future of implantology. Dr Meir Mamraev, CTO and Senior Vice-President of R & D, said that besides launching new devices soon, his company intends to increasingly target markets in North America.

Founded in 2008 by a group of oral and maxillofacial surgeons, clinicians, opinion leaders and investors in the dental industry, the company based in Shlomi has dedicated itself to designing and producing top-level tooth replacements. Besides dental implants, it also manufactures and distributes prosthetic components like abutments and various instruments for dental implant surgery.

Cortex products are currently available in major markets including Asia, where the company recently received approval by the Chinese State Food and Drug Administration, as well as Latin America and Europe. "Although we already have 30 distributors worldwide, we are still looking for new partners," Mamraev said.

"We are not present in the US yet but we are considering moving a part of our production there and opening a subsidiary, to ensure that we are ready for this large and demanding market."

He added that his company is constantly working on new patents and clinicians can soon expect to see a new wide implant for immediate loading and a mini implant for flapless procedures, among other things. [DT](#)

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