FDI closes record meeting in India

GREATERNOIDA, India/GENEVA, Switzerland: While the official figures are still to be confirmed by the organiser in India, initial estimates suggest that the FDI World Dental Federation held its most successful annual congress ever this month. As the organisation reported in mid-September, an estimated 17,000 visitors overall attended the four-day event in Greater Noida near New Delhi, which also saw the first ever visit by Indian President Pranab Mukherjee to the state of Uttar Pradesh.

Seventy-eight-year-old Mukherjee, who attended the opening ceremony at the India Expo Centre and Marit as guest of honour, said that his government is well aware of the poor standards of oral health in the country. Several programmes and projects conducted by his government and organisations like the Indian Dental Association are underway to raise awareness of the importance of good oral health and hygiene among different segments of the Indian population, with the FDI congress being one of them.

The ceremony also saw the launch of a new oral health campaign driven by the Indian Dental Association called “Happy Muskaan”, which will be supported by dental consumables manufacturer Colgate. It will conduct volunteer-based programmes throughout the country to help raise awareness of the importance of oral hygiene in daily life among the Indian population.

On behalf of the FDI, several new policy statements were adopted by its General Assembly, including statements on oral radiation, the detection of HIV and care of HIV-infected patients, as well as perinatal and infant oral health. Furthermore, the federation announced the launch of the FDI Data Hub for global oral health, a new online source for oral health statistics and indicators. Developed under the guidance of the FDI Oral Health Atlas Task Team, it aims to provide a one-stop-shop for all information pertaining directly or indirectly to global oral health, according to the FDI.

GSK and FDI partner

Dental consumables manufacturer GlaxoSmithKline will be the first organisation to collaborate with FDI for the comprehensive scientific training of oral healthcare representatives under. In a rigorous and ongoing process, independent FDI scientists are both examining and optimising 5 training modules that correspond with GSK’s portfolio of specialist products in oral health, dentine hypersensitivity and other areas, the company announced at the FDI Annual World Dental Congress in India.

According to GSK representatives, the three-year agreement will ensure a consistency of scientific training among the 1,500 GSK brand representatives worldwide, preparing them to communicate the science behind the company’s products in an approved, standardised way that resonates with dentistry leaders.

FDI launches new edition for South Asia

With the launch of the new edition of its flagship publication Dental Tribune for the South Asia region at the FDI Annual World Dental Congress in Greater Noida near New Delhi, the Dental Tribune International Publishing Group is celebrating another addition to its extensive portfolio of international dental media. The new edition will cover countries such as India, Sri Lanka, Nepal, Bangladesh, Burma and Bhutan, and is anticipated to reach an audience of approximately 100,000 dentists.

“The market in this specific region has been growing in many sectors and people are constantly embracing new technologies,” said publisher Rusmi Daruwalla, explaining the incentive behind the new edition. “What has really been missing, however, is a publication that offers high quality and can reach the maximum number of dental professionals.”

According to Daruwalla, Dental Tribune South Asia will be available in print and online.
Today, soft tissue surgery together with modern materials and techniques permit minimal invasive treatment with improved aesthetic results. Already in 2007, membranes were developed to improve the width and strength of the keratinized gingiva as well as change the gingiva typology. Over the last years, specific materials and techniques have been established for improved and more predictable results of plastic peri-implant surgery. These concepts may be supported with other modern technologies, such as the PRF-technique, aiming to improve bone, soft tissue, and connective tissue regeneration.

Dental Tribune: Oral cancer cases are growing worldwide in double digit rates. How prevalent is the disease in the Indian population and what demographics are mostly affected?

Dr Pankaj Chaturvedi: Oral cancer currently ranks amongst the three most common cancers in India and accounts for almost 40 per cent of total cancer deaths in some areas. In most regions of the country, the condition is the second most common malignancy diagnosed among men, accounting for up to 20 per cent of cancers, and is the fourth most common among women.

To make things worse, approximately 70,000 new cases are added to the already high number of oral cancer patients each year. Prevalence is highest in rural areas and vulnerable populations, such as among people with a low socio-economic status.

The most common etiological agents for oral cancer have been identified to be tobacco, alcohol, and increasingly the human papillomavirus (HPV). Does this pattern also apply to your country?

The real concern in India is tobacco as it is one of the leading agents for oral cancer have been identified to be tobacco, alcohol, and increasingly the human papillomavirus (HPV). Does this pattern also apply to your country?

The real concern in India is tobacco as it is one of the leading etiological agents for oral cancer. The disease is continuously increasing amongst youth.

In addition to tobacco, established risk factors for oral cancer are the heavy consumption of alcohol, as well as the presence of an oral premalignant disease. Other contributory or predisposing factors include dietary deficiencies, particularly of vitamins A, C, and iron, as well as viral infections, particularly induced by HPV which is known to have high oncogenic potential.

According to figures of the World Lung Foundation, the direct medical costs of treating tobacco-related diseases including oral cancer in India amounted to more than US$4 billion in 2010/11. Do patients have general access to treatment?

As the available treatment centres are mainly located in the cities and have very few resources, patients usually have limited access to treatment. Unfavourable socio-economic determinants like low literacy and low per capita income also hinder effective disease management.

Since the aetiology of oral cancer in India is predominately due to tobacco use, it is essential to implement effective preventive measures and campaigns to reduce the burden of oral cancer.
nanty tobacco-related, should prevention strategies primarily focus on people overcoming traditional habits? How realistic is that scenario in your opinion?

In the last decade, huge resources have been put into prevention as well as the control of tobacco and its related diseases. In the current scenario, prevention will hold the key for changing the age old customs and traditions into more healthy habits. This requires intervention at individual, community and national levels. Right now, there are a number of initiatives provided by the government in terms of policy making and implementation. Non-governmental organisations have also started to reach out to communities to raise awareness and refer people for early screenings. There are lot of challenges though, that we have to deal with.

What strategies do you recommend?

Tobacco control needs ongoing commitment from all parts of society. While as an individual you have the choice to use or not to use it, society has to advocate generally for a more healthy way of life. The government’s role in this is to firmly check the production, distribution and sale of tobacco. Strict enforcement and vigilance are required to effectively implement tobacco control laws.

India’s health ministry and doctors have recently asked the Ministry of Finance to raise taxes for consumption of cigarettes and tobacco products.

“...we are facing a major health crisis...”

In your mind, could this lead to less consumption?

Raising taxes on tobacco products is certainly one of the evidence-based strategies to reduce consumption of tobacco. Promising results have been achieved in states which have already seen an increase in taxation.

Prevention first starts with awareness. Is the medical and dental profession in your country sufficiently aware of the issues related to oral cancer?

Health care professionals are the major contributors in addressing the problem in the general public. Lobbying for evidence-based policy making in the implementation and continuation of tobacco cessation services are just few of the initiatives that should be supported by them. The real challenge however is to develop a more sustainable model for remote and rural areas, where poverty and illiteracy are high and an adequate preventive health infrastructure is lacking.

How effective can oral cancer awareness campaigns be there?

Studies have demonstrated that most Indians, particularly in rural areas, are not even aware of the benefits of basic oral health measures like tooth brushing.

Owing to its diversity, traditional practices in India significantly differ. Of course, oral hygiene practices still have to be considered primitive in most parts of India but this depends largely on education and financial resources. Most people are definitely aware of the benefits of good oral health but the lack of supportive environments makes them vulnerable, so they resort to more primitive habits.

The need is to re-normalise the habit, advocate for effective public health campaigns and focus on the ability to self-examine the oral cavity for early signs and symptoms of oral cancer. Community participation and involving youth to bring in change can be an effective strategy.
Far East meets Europe in Rome

Experts from South Korea presented clinical innovations in dental implantology at annual scientific meeting of the European Association of Osseointegration

ROME, Italy: For the first time in the history of the annual scientific meeting of the European Association of Osseointegration (EAO), clinical experts from a country outside Europe have participated in a special parallel guest country session organised by the association in partnership with the Korean Academy of Osseointegration. As part of this year’s scientific congress programme, clinicians and educators from dental schools in South Korea presented on a wide range of implant-related topics including computer-guided flapless implant surgery or surgical intervention in case of periimplantitis.

According to Prof. Bu-Kyu Lee, professor of Oral and Maxillofacial Surgery at Asan Medical Center in Seoul and director of International Affairs of the Korean Association of Oral and Maxillofacial Surgeons, the session also provided a comprehensive insight into the state of dental implantology in the Eastern Asian country.

“Expectations have been high since the EAO accepted the proposal by our Chairman Dr Je-Uk Park to host a parallel session at the 2014 congress in Rome,” he told Dental Tribune Asia Pacific in an interview. “I am sure that attendees will enjoy the knowledge that our experts, under the motto ‘Cutting edge of implant dentistry’, will bring to the table.”

Lee said that, while implantology in South Korea was considered inferior compared to Western Standards not long ago, the specialty has taken a big leap forward in recent years.

“Most of what we know about implantology today has its roots in developments that began in Europe,” he said. “Now we have been given the opportunity to give something back by presenting clinical knowledge and methods which have been developed in our country and could benefit implantology worldwide.”

“It is a honour to have been invited by the EAO ahead of other important markets such as Japan or the US. We hope that the presentations have been up to par with what attendees expected in terms of content and clinical skills,” Lee added.

Dental implants have come a long way in South Korea since they were introduced to the country four decades ago. Back then, US and European products wholly dominated the still young market. Now, with 225 implants per 10,000 people, the country has one of the highest implants per capita rates in the world, ranking after Germany and Israel. According to a report published by the Korean Health Industry Development Institute, the regional market exceeded US$520 million in 2013. That year, forty South Korean companies manufactured approx. 12 million dental implants. Later, in June, the Korean National Health Insurance Corporation announced that it would expand the coverage of dental implants in patients aged 70 and older beginning in 2015, and those aged 65 and older in 2016; domestic competition is thus expected to increase even further.

The market saturation has recently forced many manufacturers to increasingly pursue sales markets overseas. Owing to their price advantage, implants ‘Made in Korea’ have started to gain more market share overseas. In the Asia Pacific, a recent report by the Millennium Research Group (MRG), a market intelligence provider in Canada, has predicted that manufacturers from South Korea could dominate dental implant markets in that region as early as 2016. By that time, the total regional market is expected to exceed US$800 million.

While exports to Western countries have remained relatively slow, South Korean manufacturers offer seminars focusing on basic and advanced implant placement training and the advancement of restoration skills to dentists. Having recognised the increasing financial limitations provided by dental implants, a growing number of South Korean dentists has also taken part in seminar programmes that focus on how to remain competitive. This led to an increase in the number of dentists who are able to perform implant surgery procedures. Demand for implants has been also driven by a new trend among South Korean dentists to promote aesthetic treatment through dental implants.

Implants from Korea are also catching up in terms of clinical data, the report stated, a fact that will make them increasingly adoptable for implant specialists in that region. Manufacturers now offer seminars focusing on basic and advanced implant placement training and the advancement of restoration skills to dentists. Having recognised the increasing financial limitations provided by dental implants, a growing number of South Korean dentists has also taken part in seminar programmes that focus on how to remain competitive. This led to an increase in the number of dentists who are able to perform implant surgery procedures. Demand for implants has been also driven by a new trend among South Korean dentists to promote aesthetic treatment through dental implants.
Search engines of little use for people seeking information on implants online

According to reports, an increasing number of people tend to look for health-related information on the Internet. In the field of dentistry, dental implants currently rank among the top three most searched topics after amalgam and aesthetic treatment. The findings of a Spanish study suggest that results for this search term provided by common search engines do not lead to either easily comprehensible or useful information for users.

From the 100 highest-ranked results listed for the search term “dental implants” by the two most popular search engines, Google Search and Yahoo! Search, in autumn 2013, the researchers from the University of Santiago de Compostela found that the overall majority scored low in accessibility and usability. The information provided on the remaining websites, which were evaluated by the group over the course of the study, was also seriously lacking in terms of both of these criteria. The results on the Yahoo search engine scored slightly higher in terms of relevance and usability in comparison with Google. No significant difference could be detected between the two search engines’ results in terms of accessibility however.

The poor outcome in terms of quality in even the highest-ranked results could be a reason that patients considering dental implants are misinformed about the device or have overly high expectations for the treatment, the researchers suggested. “E-health information on dental implants in the English language is difficult to read for the average patient and poor in terms of quality,” they said in the report. “Therefore, it is necessary to generate websites that provide reliable, high-quality information about dental implants, with content that is both independent from commercial interest and easy to understand by the average patient.”

According to a quick web search by Dental Tribune, Yahoo listed slightly over 1.7 million results for “dental implants” in early September, while Google listed around twice that number. With approximately one billion users a month, the market leader remains the most popular English-speaking search engine worldwide, followed by Yahoo, which is estimated to have 300 million users.

Overall, the study only included 32 websites, of which the majority were affiliated to non-profit organisations, or medical or dental institutions. Only five of these websites were listed among the results on both search engines. Websites hosted by companies, as well as forums or discussion groups, were not included, according to the researchers.

The study, which was recently published in the Clinical Oral Implants Research journal, was conducted by the OMEQUI research group at the University of Santiago de Compostela’s School of Medicine and Dentistry.
Tooth loss expected to decline significantly in the US

CHAPEL HILL, USA: The number of edentulous people will decline significantly, a study has found. Researchers at the University of North Carolina at Chapel Hill followed edentulism over the last hundred years and predict that the number of people with tooth loss will be 50 per cent lower in 2050 than it was in 2010.

The researchers investigated population trends in edentulism among US adults at least 15 years of age by creating time-series data from five national cross-sectional health surveys: 1957 to 1958 (100,000 adults), 1971 to 1975 (14,655 adults), 1988 to 1998 (18,011 adults), 1999 to 2002 (12,536 adults) and 2009 to 2012 (10,522 adults). Birth cohort analysis was used to isolate age and cohort effects. Geographic and socio-demographic variation in prevalence were investigated using a sixth US survey of 432,519 adults conducted in 2010. Prevalence through 2050 was projected using age cohort regression models with simulation of prediction intervals.

Across the five-decade observation period, edentulism prevalence declined from 18.9 per cent in 1957 to 4.9 per cent in 2009 to 2012. The single most influential determinant of the decline was the passing of generations born before the 1940s, whose rate of edentulism incidence (5 to 6 per cent per decade of age) far exceeded that of later cohorts (1 to 3 per cent per decade of age). High-income households experienced a greater relative decline, but a smaller absolute decline, than did low-income households. By 2010, edentulism was a rare condition in high-income households and had contracted geographically to states with disproportionately high poverty. With the passing of generations born in the mid-20th century, the rate of decline in edentulism is projected to slow, reaching 2.6 per cent (95 per cent prediction limits: 2.1 per cent, 3.1 per cent) by 2050. The continuing decline will be offset only partially by population growth and population aging, such that the predicted number of edentulous people in 2050 (8.6 million; 95 per cent prediction limits: 6.8 million, 10.3 million) will be 30 per cent lower than the 12.2 million edentulous people in 2010.

“While it’s encouraging to know that this study by Dr Gary Slade illustrates a steep decline in US edentulism over the past five decades, these health gains in absolute terms have not been distributed equally,” said American Association for Dental Research President Dr Timothy DeRouen. “Additional public health measures must be taken to reduce tooth loss in low-income populations.”

The paper, titled “Projections of U.S. Edentulism Prevalence Following Five Decades of Decline,” was published online on August 21 in the Journal of Dental Research ahead of print. The journal is a publication of the International Association for Dental Research (IADR) and the American Association for Dental Research, a division of the IADR. The IADR is a non-profit organization dedicated to advancing research and increasing knowledge for the improvement of oral health, among other objectives.
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[*] Based on research by Strategic Data Marketing. Dental product categories include chairs, delivery systems, lights, and cabinetry.

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“This step has long been an ambition of ours”

With a full range of sophisticated dental bars on display at the 2014 FDI Annual World Dental Congress, UK-based dental manufacturer Prima Dental has launched its new business in its new business-to-business operation in India. Dental Tribune Asia Pacific met with sales manager Dan Hodgson and managing director Richard Muller to discuss the relevance of this market to the company and Prima Dental’s plans for its activities in the region.

Dental Tribune Asia Pacific: Why did you decide to launch your business operations in India at the FDI AWDC above all other events?
Richard Muller: The FDI congress is an event that holds international implications. As you may know, we export to 85 countries around the world. While we certainly look forward to extending our business on the Indian subcontinent, we also expect to meet relevant business contacts from overseas. The FDI congress is a particularly good event for that.

Did you have any history in India?
Richard Muller: Actually, we have been operating actively in the Indian market through presentations at trade shows, like the World Dental Show in Mumbai, since the mid-1990s. After almost 20 years, we are now here with our own business. This step has long been an ambition of ours.

Nobel Biocare to join Danaher dental business

ETI
ZURICH, Switzerland/CHARLOTTE, USA: Danaher, a US health care conglomerate of brands from various industries, and Swiss dental manufacturer Nobel Biocare announced that the two companies have entered into a definitive transaction agreement. In order to further expand its global dental business, Danaher has offered to buy Nobel Biocare, which is the second-largest supplier of dental implants worldwide, for CHF2 billion (US$2.1 billion).

Earlier this year, Nobel Biocare confirmed that it had been approached at the end of July by third parties with a potential interest in acquiring the business. Now, the company’s board of directors has unanimously decided to recommend that Nobel Biocare’s shareholders accept the offer, which includes the acquisition of at least 67 per cent of all shares.

According to Danaher, it reaches about 99 per cent of dental practices worldwide through an extensive network of dealers and direct sales. With the acquisition of Nobel Biocare, the company will become one of the largest consumable and equipment competitors in dentistry, especially in the premium segment of dental implants, with expected sales of US$5 billion. Danaher also stated that it is planning more investments.

Both companies disclosed that the transaction is scheduled for completion by late 2014 or early 2015. Once the acquisition has been completed, Nobel Biocare will operate as a stand-alone company within Danaher’s dental business, maintaining its own brand and identity.

Since 1984, Danaher has acquired more than 480 companies, KaVo Kerr Group, which unites leading dental consumable, equipment, high-tech and specialty brands under one platform, was formed at the beginning of this year. The group includes KaVo, Kerr, Axis, SybronEndo, Instrumentarium Dental, Soredex, i-CAT and Implant Direct.
Physiological healing patterns: What clinicians need to know about tooth extractions

Daniele Botticelli
Italy

After a tooth has been extracted, a series of processes are set in motion that ultimately results in the healing of the alveolus. As demonstrated in animal1,2 and human studies,3,4 intra-alveolar healing usually starts with the formation of a coagulum in the alveolus immediately after the tooth has been extracted. This clot is then progressively replaced by a provisional matrix, which functions as a scaffold for the woven bone that will form from the lateral walls and the bottom of the alveolus to fill the extraction socket eventually. Subsequent ly, the immature bone becomes mature alveolar bone.

In this time, intra-alveolar processes continue. Extra-alveolar healing occurs concomitantly and will result in vertical and horizontal resorption of the walls of the extraction sockets, a process that is more pronounced at the buccal than at the lingual aspects.5,6

A recent systematic review on post-extraction alveolar dimensional changes in hard and soft tissue in humans7 reported a horizontal dimensional loss of 29 to 65 percent and a vertical dimensional loss of 11 to 22 percent six months after tooth extraction. Moreover, it reported that the reduction of alveolar crest dimensions was faster during the first six months of healing and continued after that. In a clinical study, the width of the alveolar crest at the buccal gingival aspects was measured in edentulous sites and compared with the den tate contralateral sites in 149 cast models.8 A reduction of the alveolar crest of about 5.5 to 5.6 mm at the buccal aspect and 1.7 to 2.0 mm at the lingual aspect was observed. Another study found a total reduction of the width of the alveolar crest of about 50 percent after 5 months and of 50 percent after 12 months.8

When an implant is placed immediately into an extraction socket, the physiological healing patterns of the alveolus are different from those described above. In order to better understand these processes, it is important to mention two processes that have been proposed as explanations for osseointegration, namely distance and contact osteogenesis.9,10 While new bone is formed on the surfaces of the native bone in distance osteogenesis and the bone will come into contact with the implant surface as a result, new bone forms first on the implant surface in contact osteogenesis. An experiment was conducted on animals to test these processes11 by preparing cylindrical defects in the alveolar bone and implants (smaller in dimension than that of the defects and with a moderately rough surface) placed and stabilised by devices to guarantee their stability despite the absence of primary contacts with the native bone. After implant placement, gaps of 0.2 to 0.3 mm were obtained between the implant surface and the bony walls. After three months of healing, very little osseointegration was observed at the defect sites (0.5 to 1.5 per cent) compared with the control sites (46.1 per cent), in which implants were placed in full contact with the native bone (Fig. 1). Moreover, the defects were found to be filled with newly formed bone, which, however, did not reach the implant surface along its entire length. A space of 0.4 to 0.5 mm in width between the front of the new bone and the implant surface was observed, occupied by connective tissue that surrounded almost the entire body of the implant. Proper osseointegration may be difficult to achieve when there is no primary contact with the native bone.

In order to study this supposition, a series of experiments on animals were conducted.6,13 Recipient implant sites of 10 mm in depth were prepared in the alveolar crest according to the usual protocol. The 5 mm of the sites was subsequently widened with a drill so that a marginal gap of 5 mm in depth and 1.25 mm in width was obtained between the rough surface implant and the bony walls after implant placement. All of the experimental sites were covered with collagen membranes.

The fully submerged and histological outcomes were evaluated after one, two and four months. It was observed that the defects had filled with newly formed bone after one month (Fig. 2). However, the bone was separated from the implant surface by a 0.4 mm-wide layer of connective tissue, similar to that described in the previously mentioned study.13 Only in the apical 1.8 mm of the defects was new bone integrated on to the implant surface, leaving the coronal 5.2 mm occupied by connective tissue attached to the implant surface. After two months, 1 mm more was gained coronally, leaving a remaining defect of 1.9 mm. After four months, bone healing was finally complete (Fig. 2).

Similar patterns of healing have been described for implants placed immediately into extraction sockets,14 demonstrating again that bone formation originated from the lateral bony walls, rapidly filling the defect. Osseointegration on the surface, however, started apically within the defect from the site of contact between the implant and the native bone, and took a longer time to complete (three to four months) compared with the physiological healing of an extraction socket (one month).

Another important factor to be considered is osteoconduction,15 which can be defined as the process during which bone grows on to a surface.16 It is a well established that moderately rough surfaces provide higher osteoconductivity and induce a higher degree of osseointegration compared with surfaces.17 While this difference in osteoconductivity may have limited clinical significance, more attention should be paid to marginal defects present at implant placement. Experimental studies have demonstrated incomplete healing of marginal defects with implants with turned surfaces.18,19 This may be related to the lower osteoconductive potential and capacity of turned surfaces to maintain this property over time compared with rough surfaces. This may be relevant when implants with a turned surface are placed into extraction sockets or placed at the same surgical stage of sinus floor elevation, for example.
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For better dentistry
Secular trends in dental development

FDI presenter and paediatric dentist Dr Jayakumar Jayaraman, Hong Kong, about the evidence and why it should be applied to clinical practice

Secular trends are phenomena in physical maturation that are not cyclical or seasonal but develop over a relatively long period. An analysis of these patterns is of interest because they help us to understand the relationship between human development and the environment, as well as physiological aspects of intergenerational relationships in growth.

More importantly, secular trends can serve as indicators of developments in public health as it changes over time.1 To give an example: the average age of menarche was 17.5 years during the 1800s and since then has decreased progressively at a rate of two to three months per decade. In 2008, a study on Irish females found that the average age of menarche was 12.55 years.2 Another positive trend was observed with regard to average body height: a study of Dutch males found that their height had increased from 165 cm in 1860 to 181 cm in 1990.3

In addition to skeletal development, secular changes have been reported with regard to body weight, body mass index and other physiological aspects of the human body, such as the factors, including changes in geometric pattern, socio-economic status, as well as nutrition, health and climatic conditions. Unlike skeletal development, however, dental maturation remains relatively unaffected by other maturation phenomena.3 The secular changes observed in dental development, which includes dental maturation and emergence, are reflections of these minor changes that have been occurring over several years.

While dental maturation is the development of the anatomical components of a tooth, a process that starts with the initiation of crown formation in utero and continues until closure of the root apex in the early twenties, dental emergence is the eruption of a tooth into its relative position in the arch.

There is evidence that secular trends exist for both of these processes. For example, research has demonstrated delayed dental maturation in the remains of eighteenth-century children compared with dental records of children living in modern England.4

By analysing the maturation of a permanent tooth, Nadler also found that children living in the 1900s showed advanced maturation compared with children born two decades earlier.5

A similar trend was observed in dental emergence in a study that found advanced emergence in Japanese children from the 1900s compared with children in 1954.6 Detected mostly in the permanent dentition, and to a minimal extent in the primary dentition, this finding was verified by research involving children in Finland, Germany and Hong Kong.

Dental development is a sequential process that varies substantially between the sexes and between populations with different ethnicities. For example, many studies have reported advanced dental development in females compared with males, a finding that is prevalent in all population groups. Similarly, advanced dental emergence has been observed in African-American children compared with Chinese and Japanese children.

Various secular trends have also been found in maxillary and mandibular dentition. There is widespread agreement that the latter is more advanced in dental maturation, as well as emergence, since mandibular teeth are the first to erupt in the oral cavity in both the primary and permanent dentition.

Nadler reported advanced dental maturation based on evaluation of only the growth pattern of a mandibular canine. The reason for this approach comes from an earlier study that found a correlation between the maturation of mandibular canines and ossification centres in the hand. This study also concluded that a strong relationship exists between dental and skeletal development.7 The use of a single tooth type to analyse secular trends has been criticised by several authors for ignoring that each tooth exhibits different patterns of maturation. It has been suggested that all developing teeth must be included in the analysis in order to confirm a secular change. In our own study of 5- and 6-year-old children in Hong Kong, we found accelerated maturation of permanent teeth in children born in 2001 compared with children born in 1981. However, this trend was observed only in the maxillary dentition. As agreed by other investigators, in both year cohorts, females showed advanced development compared with males.8

With such strong evidence, we need to bring the applicability of common dental atlas charts, such as those developed by Schour and Massler, whose tables and charts are based on institutionalised American Caucasian children in the 1920s,9 to the current population into question. A recent study conducted in London tested the applicability of old and modern dental charts and found that the older charts were inaccurate. However, most clinical textbooks in dentistry still reproduce these charts, mainly because few other population-specific dental charts exist.

There is a need for evidence-based dental charts created from modern and healthy samples identified by sex and ethnicity. Once created, they could not only serve as an eminent tool in forensic dentistry for estimating the age of subjects with undocument birth records, but also provide insight on current dental development standards that could be utilised for appropriate time-related management of dental conditions.10

A list of references is available from the publisher.

Contact Info

Dr Jayakumar Jayaraman is a paediatric dentist from Hong Kong with special research interests in dental anthropology, forensic dentistry, legal medicine and human identification. He is the foundation’s director of age assessment and, for this reason, he started the Date of Birth Foundation, the world’s first charity organisation to promote accurate birth records. He can be contacted at drjayhk@hotmail.com.

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Dental panoramic radiograph showing development of permanent teeth in a 11-year-old Chinese boy

“...serve as indicators of developments in public health...”

Interdisciplinary management of missing left lateral incisor and impacted canine of a Chinese girl aged 12 years.

Clinical guidelines for the use of ProTaper Next instruments (Part II)

Fig. 1c: Preoperative radiograph of a maxillary right second premolar. — Fig. 1d: Postoperative radiograph after canal obturation with Guttarcore obturators (DENTSPLY Maillefer). — Fig. 1e: Preoperative radiograph of a maxillary right first molar.— Fig. 1f: Postoperative radiograph after canal obturation with Guttarcore obturators (DENTSPLY Maillefer). — Fig. 1g: Postoperative radiograph after canal obturation with Pathfiles and ProTaper Next X2. Obturation was done with Guttarcore obturators. Note maintenance of ‘S’-shaped curvature in the obturated distobuccal root canal system.

Recently, the ProTaper Next system (DENTSPLY Maillefer) was launched into the dental market. In part 1 of this series, published in the July/August edition of Dental Tribune Asia Pacific, the authors outlined the clinical guidelines for the use of the ProTaper Next instruments. There are five instruments in the system but most canals can be prepared by using only the first two instruments. The first instrument in the system is the ProTaper Next X1, with a tip size of 0.11 mm and a 4% taper. This instrument is used after creation of a reproducible glide path by means of hand instruments or rotary Pathfiles (DENTSPLY Maillefer).

The ProTaper Next X1 is always followed by the ProTaper Next X2 (0.25 mm tip and 6% taper). This instrument can be regarded as the first finishing file in the system, as it leaves the prepared root canal with adequate shape and taper for optimal irrigation and root canal obturation. The ProTaper Next X1 and X2 leaves the instruments in the canal, allowing the instruments to engage the canal wall at any time. This will contribute to a reduction in taper lock, screw-in effect and stress on the file. It also ensures debris removal in a coronal direction because the off-center cross-section allows for more space around the flutes of the instrument. This will lead to improved cutting efficiency, as the blades will stay in contact with the surrounding dentin walls. Root canal preparation is done in a very fast and effortless manner. Furthermore, the swaggering (asymmetric) rotary motion of the instrument initiates activation of the irrigation solution during canal preparation, improving debris removal. The design also reduces the risk of instrument fracture because there is less stress on the file and more efficient debris removal. Every instrument is capable of cutting a larger envelope of motion (larger canal preparation size) compared to a similarly-sized instrument with a symmetrical mass and axis of rotation. This allows the clinician to use fewer instruments to prepare a root canal to the adequate shape and taper to allow for optimal irrigation and obturation. Finally, there is a smooth transition between the different sizes of instruments because the design ensures that the instrument sequence itself expands exponentially.

After gauging with a size 25 nickel-titanium hand instrument, it was decided to enlarge the palatal root canal to a ProTaper Next X3. All three root canals were obturated with matching ProTaper Next gutta percha cones using the Galamus Dual Obturation Unit (Fig. 2h). Note the maintenance of the ‘S’-shaped curvature in the obturated distobuccal root canal system.

Challenging curvatures in the apical third of root canals

Apical root canal curvatures must always be respected and never straightened. According to CatelLuci,1 straightening these curves would mean displacing the apical foramen from its original position, which can lead to treatment failure. Other problems that can be encountered when treating curved canals include ledge formation, perforation, zip formation and file separation.2

It is very important to identify canal curvatures during initial canal negotiation in order to avoid the above mentioned preparation errors. The greater the angle of curvature and the smaller the radius of curvature, the more complex the management and treatment will be.1

Again, the authors would recommend using all three Pathfiles in these challenging root canal systems to enlarge the glide path prior to canal preparation. It is also important to note that the reduced apical tapers of the ProTaper Next instruments (compared to ProTaper Universal) are ideal for maintaining apical curvatures or ‘S’-shaped root canals.

Case report one

The patient, a 41-year-old female, presented with irreversible pulpitis on her maxillary right second premolar (Fig. 1a). The length determination radiograph revealed an ‘S’-shaped canal configuration (Fig. 1b). The canal was negotiated and glide path enlarged using Pathfiles no. 1, 2 and 5. Canal preparation was done with ProTaper Next X1 and X2.

In this case, emphasis was placed on using a backstroke, outwards brushing motion with the ProTaper Next instruments to remove restrictive dentin in the canal, allowing the instruments to progress apically. The canal was obturated (Fig. 1c) with a size 20 Guttacore obturator to working length followed by another X2 Guttacore obturator to ensure adequate obturation of the oval coronal part of the root canal system.

Case report two

A 45-year-old male patient presented with severe pain on his maxillary right first molar. A periapical radiograph revealed placement of a deep amalgam restoration (Fig. 2a). The length determination radiograph revealed an ‘S’-shaped apical curvature in the distobuccal root canal (Fig. 2b). The root canals were negotiated to working length and the glide paths enlarged using Pathfiles no. 1 and no. 2. ProTaper Next no. 5 was used in the distobuccal root canal. Canal preparation was done with ProTaper Next X1 and X2 in all three root canals.

Prof. Dr. J. van der Veyver & Dental Tribune International

Smith Alvis US

The instruments have a bilateral central axis of rotation (except in the last 5 mm of the instrument, D013 creating an asymmetric rotary motion. The exception is the ProTaper X1, which has a square cross section in the last 5 mm to give the instruments a bit more core strength in the narrow apical part. The asymmetric rotary motion allows the instrument to experience a rotational phenomenon known as precession or swagger.2 According to Van der Veyver and Scianambolo,3 the benefits of this design characteristic include that it further reduces (in addition to the progressive tapered design) the engagement between the instrument and the dentine walls because only two cutting points make contact with the canal wall at any time. This will contribute to a reduction in taper lock, screw-in effect and stress on the file. It also ensures debris removal in a coronal direction because the off-center cross-section allows for more space around the flutes of the instrument. This will lead to improved cutting efficiency, as the blades will stay in contact with the surrounding dentine walls. Root canal preparation is done in a very fast and effortless manner. Furthermore, the swaggering (asymmetric) rotary motion of the instrument initiates activation of the irrigation solution during canal preparation, improving debris removal. The design also reduces the risk of instrument fracture because there is less stress on the file and more efficient debris removal. Every instrument is capable of cutting a larger envelope of motion (larger canal preparation size) compared to a similarly-sized instrument with a symmetrical mass and axis of rotation. This allows the clinician to use fewer instruments to prepare a root canal to the adequate shape and taper to allow for optimal irrigation and obturation. Finally, there is a smooth transition between the different sizes of instruments because the design ensures that the instrument sequence itself expands exponentially.

The aim of this article is to illustrate the use of ProTaper Next instruments in complex and challenging endodontic cases. The preparation technique for minimally invasive root canal preparation with ProTaper Next instruments will also be discussed.

S-shaped root canals

A major challenge in endodontics is the treatment of ‘S’-shaped or bayonet-shaped root canals. This type of root canal configuration can be present in root canal systems of maxillary laterals, canines and premolars, as well as mandibular molars.4 The authors would recommend using Pathfiles no. 5 (ISO tip 0.85 mm) after Pathfiles no. 1 and 2. In these challenging root canal systems the final glide path preparation file. This will increase the glide path size before introducing the ProTaper Next X1, resulting in less engagement as the file travels down the canal curvatures.

Case report one

The patient, a 41-year-old female, presented with irreversible pulpitis on her maxillary right second premolar (Fig. 1a). The length determination radiograph revealed an ‘S’-shaped canal configuration (Fig. 1b). The canal was negotiated and glide path enlarged using Pathfiles no. 1, 2 and 5. Canal preparation was done with ProTaper Next X1 and X2.

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Case report two

A 45-year-old male patient presented with severe pain on his maxillary right first molar. A periapical radiograph revealed placement of a deep amalgam restoration (Fig. 2a). The length determination radiograph revealed an ‘S’-shaped apical curvature in the distobuccal root canal (Fig. 2b). The root canals were negotiated to working length and the glide paths enlarged using Pathfiles no. 1 and no. 2. ProTaper Next no. 5 was used in the distobuccal root canal. Canal preparation was done with ProTaper Next X1 and X2 in all three root canals.

The root canals were negotiated to working length and the glide paths enlarged using Pathfiles no. 1, 2 and 5. Canal preparation was done with ProTaper Next X1 and X2.
The coronal two thirds of the canals were prepared with ProTaper Next X1 and X2 using a backstroke, outward and forward motion to remove restrictive dentine in the canals, allowing the instruments to progress towards the apical third. The apical fifth of the root canals were prepared with a controlled push-pull motion, allowing the instruments to progress up to working length.

The prepared root canals were gauged with a size 25 nickel titanium hand file. The file was snugged working length except in the distal canal of the lower first molar. This canal was enlarged with a ProTaper Next X5 instrument. Figure 3e shows radiographic confirmation of the working length and the fit of the plastic carriers of size 25 ProTaper obturators (without gutta percha). All the canals were obturated (Fig. 3d) with size 25 ProTaper obturators, except the distal root canal in the lower first molar that received a size 50 ProTaper obturator. Figure 3e demonstrates the final result after obturation and Figure 3f illustrates the final result after obturation with ProTaper Next — Fig. 3f. Final result after the canals were obturated with ProTaper Next obturators.

Minimally invasive canal preparation
According to Gutmann’s minimally invasive endodontics (MIE) procedures can range from diagnosis to making a decision to treat (or not to treat) the case. They also include:

- Minimal removal of dentine during access cavity preparation, enlarging and shaping of the root canal system to retain as much as sound dentine as possible.
- Retention of tooth structure during disassembly and retreatment procedures.

We have to accept that if access openings are too restricted it can impact on the final result of treatment. Gutmann further suggests that efforts should be made to minimise the excess removal of cervical tooth structure in the canal orifice through the use of Preo reamers, Gates Glidden burs and orifice opening instruments. These instruments tend to straighten the canal and weaken the root canal walls, predisposing them to cracks and, in some cases, can even lead to root canal wall splitting defects. For some clinicians, it might be an option not to brush excessively with opening instruments. These efforts should be made to minimise the excess removal of cervical tooth structure in the canal orifice through the use of Preo reamers, Gates Glidden burs and orifice opening instruments. These instruments tend to straighten the canal and weaken the root canal walls, predisposing them to cracks and, in some cases, can even lead to root canal wall splitting defects. 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Minimally invasive, maximally effective

The new Piezomed offers extremely high performance, yet is gentle on soft tissue. In addition, it includes automatic instrument recognition and LED handpiece illumination. The handpiece with the cable is thermo washer disinfectable and sterilizable!
The palatal canal was obturated with a ProTaper Next X3 gutta percha cone using the Calamus Dual Obturation Unit (DENTSPLY Maillefer).

It was decided to obturate the two mesiobuccal and distobuccal canals with Guttacore crosslinked gutta percha carriers.

It must be noted that because of the more conservative canal preparations obtained with the push-pull preparation protocol it was not possible to passively fit a size X2 Guttacore verifier (size 0.025) up to working length in the prepared root canals. Only size 20 Guttacore verifiers fitted passively, without resistance to working length (Fig. 6a).

The selected root canals were then obturated using three size 20 Guttacore obturators. Figure 6b shows the final result after obturation.

Carrier-based obturation also forms part of the MIE concept due to the minimal amount of application forces involved during the obturation process onto the remaining root structure.

Editorial note: A complete list of references is available from the publisher.

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October marks return of ICOI World Congress to Japan

Prestigious event for dental implant rehabilitation to take place at Tokyo International Forum

TOKYO, Japan: Ten years ago, the International Congress of Oral Implantologists (ICOI) first held its World Congress in Tokyo, Japan. In October, the annual meeting finally makes its first return to the Japanese capital, that will be organised by the ICOI’s Asia-Pacific section. Held at the Tokyo International Forum, the three day event will run from 3 to 5 October.

According to Scientific Chairman Dr Koichi Ito, with which the ICOI Asia-Pacific had the opportunity to speak in early September, participants of the congress in Tokyo can look forward to an impressive line-up of international and local speakers. Among other topics, clinicians and dental implant experts from the US, Western Europe and Japan have announced that they will present papers on the diagnostic use of cone beam computed tomography, the association between implant surface and osseointegration, and tooth regenerative therapy as future dental treatment. The programme is accompanied by an industry exhibition, where over 50 companies will showcase the latest products and solutions.

“I think we have seen incredible development in dental implantology in Japan since the last congress was held ten years ago,” Ito remarked. “With the tremendous support from the ICOI over these years, our membership in Japan has created a clinical environment which is characterised by clinical excellence and increasing trust from the general public.”

The overall market for dental implants has an estimated value at ¥350 billion (US$3.25 million), with only moderate growth rates to be expected in years to come. While Japan is generally considered to have a surplus of dentists, only few practising dentists in the country actually used to place dental implants. From these only few place more than ten implants per year, which according to the ICOI is an ADA CERP recognised provider. Delegates who have registered for the congress can earn continuing education credits (maximum 18) by attending scientific sessions during the meeting. All presentations are in lecture format. They qualify for AGD Subject Code 690 Implants.
Cochrane reports no evidence for superior long-term success of dental implants

MELBOURNE, Australia/MANCHESTER, UK: Promising superior clinical outcomes, plenty of new dental implants are launched to markets each year. A report by researchers from the Cochrane Oral Health Group in Melbourne and Manchester has recently suggested that there may be no differences in terms of long-term success, regardless of the shape of the implant or the material used.

The researchers reviewed randomised clinical trials conducted around the world from the group’s own database. From this, the only statistically significant difference observed was in relation to surface preparations, with smoother (turned) surfaces being found to be less prone to bone loss associated with peri-implantitis than were rougher surfaces.

Smother surfaces, however, appeared to fail early more often, according to the analysis.

Similar results were reported by the group in a series of earlier reviews, of which the first was published in 2002. In the most recent update, two of the review authors independently compared 38 different implant types, which had been placed in 27 trials involving more than 1,500 patients, ranging from the early 1980s to early 2014. They said that, while their report provided no evidence that one specific type of implant proved superior in terms of long-term success to other types of implants with different characteristics, the results would have to be evaluated carefully owing to the low number of participants and short follow-up periods, which ranged from one to ten years.

Overall, more than half of the reviewed trials proved to be at high risk of bias, they said.

“One well known weakness of such a meta-analysis of several small studies is that it cannot predict the results of a larger study,” remarked Prof. Stefan Holst, Global Head of Research and Science at Nobel Biocare, one of the global market leaders in dental implantology, on the report’s findings.

“With 38 different implant types with highly diverse geometries, surfaces, prosthetic superstructures and clinical protocols applied—several of which are no longer in use—there are many variables. The meta-analysis dilutes any potential effect of a single relevant implant surface or implant characteristic in clinical practice today.”

A representative of Straumann also cautioned against the results, saying that the review reflected the fact that there is very little or no published clinical data on the majority of commercially available dental implants, since they have not been clinically tested.

He emphasised that of all the implants available today only 38 tested in randomised controlled clinical trials were considered worthy of review.

“A representative of Straumann also cautioned against the results, saying that the review reflected the fact that there is very little or no published clinical data on the majority of commercially available dental implants, since they have not been clinically tested.”

According to the Cochrane Collaboration, there are more than 1,300 different dental implants available on the market today. The total value of fixed tooth replacements was estimated to be US$3.4 billion in 2011, a figure that some analysts expect to almost double in the next five years owing to the increasing demand of an ageing population and more dentists starting to place dental implants.
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<td>Z-System AG</td>
<td>20–21</td>
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Last update was 17 September, 2014.
NEW POLYMER BLOCK ALLOWS CUSTOMIZED IMPLANT RESTORATIONS FOR CEREC AND INLAB

Its new, highly cross-linked polymer block completes the digital workflow to include temporary restorations in implant dentistry, Ivoclar Vivadent has recently announced. The Telio CAD A16, for the first time a block with a pre-fabricated interface is available, which allows the direct fabrication of hybrid implant restorations for single-tooth tempora-
sation. Moreover, the block is suppo-
sed to enable users of CEREC and inLab to create customized monolithic hybrid abutment crowns. The pre- fabricated interfaces in sizes S and L are tailored to the requirements of titanium bases from Sirona. Accord-
ing to Ivoclar Vivadent, the com-
pleted restorations can be directly cemented on the Ti base.

As a result of the industrial pro-
duction process, temporary hybrid abutment crowns made of Telio CAD A16 fit extre-
me accurately, reducing the treatment time for users and patients. The hybrid abutment crown is easy to adjust and provides a clear idea of what the permanent restoration will look like. In addition, a proper emergence pro-
file can be ideally developed and shaped. The restoration can be in-
corporated immediately after the implantation procedure or after the healing phase.

Ivoclar Vivadent said that Telio CAD A16 forms an ideal basis for long-
term, implant-supported restorati-
ons fabricated with IPS e.max CAD Abutment Solutions. The self-curing luting composite Multilink Hybrid Abutment ensures an excellent bond of the restoration to the titanium base. The PMMA block is offered in six shades (B1, A3, A2, A3.5, 1). Restorations made of this block are indicated for a wear period of up to 12 month.

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CBCT IMAGING WITH LOWER DOSES

Planmeca Ultra Low Dose is a new imaging protocol that is sup-
posed to allow CBCT imaging with an even lower patient radiation dose than standard 2-D panoramic imaging. It is based on intelligent 3-D algorithms, according to Plan-
meca, and offers a vast amount of detailed anatomical information at a very low patient dose. Two-dimen-
sonal imaging, therefore, can no longer be justified, the manufactu-
rer said.

Planmeca Ultra Low Dose is available with all Planmeca ProMax 3D imaging units. Images taken with the protocol can be used for a large variety of clinical cases, such as postoperative and follow-up studies in maxillofacial surgery, orthodontics, implant planning, as well as ENT studies.

The Tampere University Hospi-
tal in Finland is one of the facilities which has changed imaging prac-
tices owing to the new protocol. “We have been using the new Planmeca Ultra Low Dose protocol since last summer, and we have found it to be very useful in many imaging indications,” a representa-
tive said. “These include postope-
rative follow-up studies, orthodon-
tic cases requiring localisation of impacted teeth and their effects on the neighbouring ones, detection of facial asymmetries, sinus ima-
ging in certain ENT cases where sinusitis needs to be excluded, pha-
yngeal airway measurements in sleep apnoea patients, as well as many implant cases.”

According to the representa-
tive, the protocol also had a signifi-
cant impact on patients. “We often found them to be concerned about radiation exposure, but once they hear that the dose is even lower than in traditional panoramic 2-D imaging, they are always relieved. Also, referring physicians often specifically ask us to use the Ultra Low Dose protocol,” he said.

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Planmeca, Finland
www.planmeca.com

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