Milions of new HIV infections

A new report by the organisation UNAIDS has called on countries in Asia and the Pacific region to scale up HIV prevention programmes and structural interventions for men with high-risk sexual behaviour. The report released at the 9th International Congress on AIDS in Asia and the Pacific in Bali, Indonesia, notes that men who buy sex constitute the largest infected population group — and most of them are either married or will get married. This puts a number of 50 million women, often perceived as ‘harmless’ because they only have sex with their husbands, at risk of HIV infection.

Despite being in a relationship, at least 75 million men regularly buy sex from women or men in Asia, and a further 20 million men have sex with other men or are injecting drug users, according to UNAIDS figures.

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A research team in Israel has developed a new way to electrochemically deposit synthetic hydroxyapatite onto dental implants. Instead of spraying the coating with plasma, the implant is placed into a bath of electrolyte solution, to which an electric current is applied. The findings support a new theory that humans may have been evolved in Asia.

This photo shows a Ganlea holotype fossil jaw (lateral view) recently found in Myanmar. It is placed into a bath of electrolyte solution, to which an electric current is applied. The findings support a new theory that humans may have been evolved in Asia.

Therapy of craniofacial defects successful

HONGKONG/LEIPZIG, Germany: At a meeting on regenerative medicine and stem cell research in China, clinicians from Spain presented what could be a breakthrough in the treatment of craniofacial defects. With the help of Bone Repair Cells (BRCs) developed by the US company Aastrom Biosciences Inc., patients experienced new bone formation and nerve recovery in cases of severe mandibular osteoradionecrosis and osteomyelitis. Bone Repair Cells are derived from a small sample of the patient’s bone marrow, which is processed using Aastrom’s proprietary Tissue Repair Cell (TRC) technology to generate larger numbers of stem and early progenitor cells with enhanced therapeutic potential.

“The outcome of these treatments with BRCs has been very satisfactory. We observed early bone formation in the affected areas that eventually resulted in complete healing,” said Dr Jose Mendonca, Director of the Head and Neck Surgery Unit of Hospital POLUS A in Lugo in Spain and previously a Clinical and Research Fellow in Oral and Maxillofacial Surgery at the UCLA School of Dentistry. “Unexpected therapeutic results from treatment with BRCs include peripheral nerve regeneration or repair, new skin formation and proliferation in blood vessels in ischemic areas. The results open a promising pathway for the treatment of some patients where conventional therapies fail or do not exist.” Ethical approval for compassionate use of TRC-based products was granted by the Spanish Ministry of Health.

In May 2008, Aastrom announced the re-prioritisation of its clinical development programmes to focus primarily on cardiovascular applications, thus discontinuing further patient enrolment in the US Phase III ON-CORE bone regeneration clinical trial. The company does not anticipate new clinical bone activity or reactivating the Phase III ON-CORE trial at the present time but will continue to treat patients on a compassionate-are-use basis in Spain. “Our bone programme remains open for participation. Encouraging compassionate-are-use treatments such as those noted by Dr Mendonca strengthen our bone-programme portfolio, especially in China,” said Dr Sheldon A. Schaffer, Aastrom’s Vice-President of Corporate Development and Intellectual Property.

The CEO of Nobel Biocare, Scala speaks at the 9th International Congress on Aids in Asia and the Pacific region. The meeting, which is part of the organisation’s 75th anniversary celebrations, aims to provide simultaneous medical and dental treatment to a record number of beneficiaries in the country’s 62,000 districts, also called barangays.

The Philippine Charity Sweepstakes Office has announced that it will run the world’s largest single-day medical mission in early September. The mission, which is part of the organisation’s 75th anniversary celebrations, aims to provide simultaneous medical and dental treatment to a record number of beneficiaries in the country’s 62,000 districts, also called barangays.
Ancient teeth question origin of men

HONG KONG/LEIPZIG, Germany: Humans may have been evolved from primates in Asia, fossils found in Myanmar suggest. The jawbones and teeth of the primate related to a family of Asian anthropoids are ten times older than Lucy, the famous anthropological research has already assumed the modern ecological role of modern monkeys 58 million years ago,” Dr. Beard said. Recent paleoanthropological research has been focusing on evidence that anthropoids originated from prosimians and some scientists also argued that primates such as Genela megacrinus were not anthropoids at all.

Malaysia takes on shortage of dentists

Malaysia National News Agency

PENANG, Malaysia: As a first step to establishing a National Oral Health Center, the Health Ministry of Malaysia has announced the formation of a Center of Excellence for dentistry in several hospitals nationwide. The center will be opened in stages later this year and cover various disciplines, such as mouth-cancer screenings and dental surgery, Health Minister Datuk Seri Love Tiong Lai told reporters at the Malaysian Dental Association's AGM held in George Town last week.

The Health Minister added that the center will be crucial for dental experts in his country to enhance their specialities in line with current technological advancements. As oral health is becoming more complex, there is need for expertise and specialisation, he said. This year, the government has already given out 56 scholarships to students in selected fields of dentistry compared to 29 last year.

Malaysia is facing a shortage of dentists and needs to increase their numbers in order to cope with the increasing demand for dental care. According to ministry figures, only 60 per cent of posts for dental officers in the Health Ministry were filled in 2008 and only 56 per cent of all dental specialist posts. The Health Minister said that his ministry aims to triple the number of dentists and increase the ratio of dentists to the population from slightly over 1:8,000 to 1:4,000 by the year 2017.

On 51 December 2008, there were 5,410 dentists in Malaysia, of which 241 were specialists.

(Edited by Daniel Zimmermann)
Micronesia study confirms oral health benefits of xylitol

Claudia Salwiczek, DTI

Recently, the use of a xylitol syrup rinse was confirmed to be effective protection against tooth decay. Researchers, who conducted a study in the Republic of the Marshall Islands where the caries rate is two to three times that of the typical American or European community, found that 16 ml of xylitol syrup could prevent up to 70 per cent of decayed teeth. The findings were presented in the July issue of the Archives of Pediatrics & Adolescent Medicine, and demonstrate the first evidence (to the authors’ knowledge) that xylitol is “effective for the prevention of decay in primary teeth for toddlers.”

Scientists in Finland first discovered the beneficial uses of xylitol in dentistry in the early 1970s. Studies led by Profs. Kauko K. Mäkinen and Arje Schein at the Institute of Dentistry at the University of Turku proved that xylitol, which occurs as a sugar in the fibres of many fruits and vegetables, inhibits the adhesion of the caries-causing oral bacteria Streptococcus mutans.

Xylitol is widely used in a number of dental care products, including chewing gum, toothpaste and mouth rinses.

Beijing targets health

The government of Beijing has announced a ten-year plan for raising the average life span of its citizens through increasing health awareness and the improvement of health care services. Further objectives are to reduce obesity rates in primary and middle schools, as well as to lower mortality rates amongst pregnant women and babies, city officials told reporters at a press conference in August. Improved dental hygiene will also be a point of focus, they said.

Living conditions and lifestyles have changed rapidly in major Chinese cities like Beijing and Shanghai. An unhealthy diet rich in sugars, low exposure to fluoride in general and a lack of tradition in personal care and oral hygiene are major factors in increasing dental caries incidence rates. Growing tobacco consumption and excessive use of alcohol have also increased the risk of periodontal disease and oral cancer. Beijing has invested US$2 million in recent years on caries prevention programmes but needs to do more to improve oral health status amongst its citizens. According to the third national oral epidemiological survey in 2008, over 90 per cent of people in the city suffer from some form of oral disease.

Fang Laiying, director of the Beijing Municipal Health Bureau, said that the municipal government hopes to improve the health of locals comprehensively through the plan’s implementation. He said the incidence of chronic, non-infectious diseases has been on the rise in recent years, including high blood pressure, diabetes and coronary disease. The municipal government will work intensively to achieve the plan’s objectives, through popularising health information, such as correct toothbrushing, and advocating healthy food, tobacco control and more exercise. Efforts will also be made to further dental health care, eye care, personal health awareness, and safeguard the health of mothers and infants.

Laiying added that a committee for health promotion with personnel from 18 governmental departments had been set up by the municipal government to oversee the efforts of urban districts, suburban counties and relevant government departments in implementing the plan. The funds necessary for implementing the plan will be provided for in the city monetary budget, he said.

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Xylitol is widely used in oral care products like chewing gum (2003 Photo Yellow).
Dear reader,

A friend of mine recently had a bacterial infection. In telling me about his problems, the first thing he mentioned was that he had experienced symptoms of dry mouth and mucous film. He had also suffered from hypersensitive teeth.

My friend’s example, though trivial in nature, is a good example by which to demonstrate the way the oral cavity functions as a window to one’s health. Every day, the salivary glands secrete over 1.5 litres of saliva into the oral cavity, carrying with it valuable information. These biomarkers can be from sites of disease, or the salivary glands themselves can produce surrogate biomarkers of disease. The good news is that the information provided by these can be obtained non-invasively, painlessly and with no embarrassment to the patient—without needles or cramping.

Owing to these salivary properties, a dental examination today is no longer only about teeth and gums. Dentists should be aware that they are probably the first to detect signs of systemic diseases in their patients. Take HIV/Aids for example: despite new, effective medication, the latest infection rates still demonstrate a continued increase in poor and developing countries alike. According to a recent report by UNAIDS, for example, an estimated 50 million women in Asia alone are at risk of becoming infected with HIV/Aids by their intimate partners in the next decade. Early detection could significantly reduce morbidity here.

Oral fluid testing technologies are under development and already in use in several dental offices in Europe and the US. It will be years, perhaps even decades, before these tests are a regular part of every visit to the dentist, but there is no doubt that they will play a valuable part in the management and control of worldwide epidemics, such as HIV/Aids or cancer.

On a broader aspect, I see cooperation at work amongst the member countries because we come to the assistance of professionals in need of employment and patients with professional health care needs wherever they may be. The Philippines boasts of quite a number of dental professionals every year and we see this as an opportunity for us to alleviate the growing need for health workers in the ASEAN region. This reciprocal act of employing health workers internationally signals the need to apply a standardised guideline procedure to the delivery of health services, thus raising the level of care to a level consistent with that in the rest of the world. This minimises errors and malfatremt.

However, as a member of the academe, a part of me views the agreement as a noble programme; yet, the other part disagrees because not all member countries are on an equal footing. The accumulation of Continuing Professional Education (CPE) units is an obligation of the professional in his or her desire to further his or her skills. This ensures patients of a high level of quality of treatment. Unfortunately, not all participating ASEAN members have established guidelines set by the professional regulating bodies of their particular governments on this matter. I like countries such as Singapore, Taiwan, Japan and Korea, to name a few, who had these guidelines long before this agreement took place. The system in the Philippines was stopped for almost ten years, owing to a bill filed by a senator who argued that earning CPE units be optional rather than mandatory. Recently, owing to the passage of the new dental law in the Philippines, the acquisition of CPE credit units became mandatory again, for which we are so thankful, but unfortunately, the almost ten-year backlog away precious credit units earned by our dentists.

As a certain amount of CPE units is required of an applicant, it is possible that dentists from countries with no clear set of rules on their acquisition and recording may be denied employment, simply because their governments have not taken steps to ensure that all credit units earned by attending seminars, symposiums, conventions and the like have been properly recorded in the educational programme of their professional regulating bodies.

If I am in-depth consultation with the various heads of professions involved in this agreement should have taken place prior to a thorough review of our ASEAN neighbours. This could have led to further ironing out of kinks in the programme, thereby making it a better-informed foreign reciprocity programme, which is fairly beneficial to all the health care providers in our region.

“...should have taken place prior to forging ties with our ASEAN neighbours”

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FDA says mercury dental fillings not harmful

WASHINGTON, DC, USA: The US Food and Drug Administration said recently silver-coloured dental fillings that contain mercury are safe for patients, reversing an earlier caution against their use in certain patients, including pregnant women and children. While elemental mercury has been associated with adverse health effects at high exposures, the levels released by dental amalgam fillings are not high enough to cause harm in patients, the FDA said, citing an agency review of roughly 200 scientific studies.

In 2006, Moms Against Mercury and three other groups sued the FDA to have mercury fillings removed from the US market. Later that year, an FDA panel of outside experts said most people would not be harmed but that more information was needed.

But Susan Runner, acting director for the FDA division that oversees dental devices, said there was no “causal link” between amalgam fillings and health problems. “The best available scientific evidence supports the conclusion that patients with dental amalgam fillings are not at risk,” she told reporters on a conference call. Over the past 20 years, the agency has received just 141 reports of problems in patients with the fillings, she added.

That conclusion counters a statement the agency made last June that the fillings may cause health problems in pregnant women, children and fetuses.

The FDA’s decision could impact makers of metal fillings, which include DuPont, International and Danaher Corp’s unit Kerr, as well as distributors such as Henry Schein Inc and Patterson Cos Inc.

According to the American Dental Association (ADA), about 50 per cent of fillings given to patients are mercury-filled, with a growing number of patients instead opting for lighter, tooth-coloured options such as resin composites. The ADA, which represents the dental industry, backed the FDA’s decision not to restrict mercury fillings, saying alternatives are also considered “moderate risk” by the FDA. “The FDA has left the decision about dental treatment right where it needs to be—between the dentist and the patient,” ADA President Dr John Findley said in a statement.

But Charlie Brown, a lawyer for Consumers for Dental Choice, said poorer people or those who receive their health care through large institutions such as the US military are more likely to receive the cheaper, silver-coloured fillings and are at greater risk for harm.

“Most consumers, and most dentists, have already switched to the main alternative, resin composite,” said Brown, whose group was part of the lawsuit settlement last June that called on the agency to issue more specific rules. His group is now weighing its legal options, he said.

Moms Against Mercury President Amy Carson said she was disappointed in the FDA’s reversal. Her group, along with several others, filed a new petition with the FDA on Tuesday, again calling for a ban on mercury fillings, she added. [2]

(Edited by Daniel Zimmermann)

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UK universities say no to British applicants

Universities in the UK are reported to exploit a government policy that keeps British applicants out, while leaving no restrictions in terms of international applicants. According to the newest figures released by the Higher Education Statistics Agency in London, the number of domestic higher education (HE) students enrolling at UK universities has stalled lately, while that of students coming to study from overseas has continued to rise.

After the US, Britain is currently the second most popular choice of destination for HE students. More than one university student in seven is from outside Britain, and those from outside the EU bring in 8 to 10 per cent of the total income of British universities, paying almost £1.9 billion in tuition fees last year.

The government has refused to fund enough places in order to accept extra applicants from the UK, even though the statistics are dampening hopes of the current administration of reaching the target of 50 per cent of 18- to 30-year-olds with a university education by 2010. Even after clearance, some 20,000 to 40,000 are expected to be left with no place at all this autumn.

Nanotech makes fillings last longer

A US research project is currently investigating a new technique that may extend the longevity of dental fillings. Dr Franklin Tay, Associate Professor of Endodontics at the Medical College of Georgia School of Dentistry, has been awarded a two-year US$250,000 grant from the US National Institute of Dental and Craniofacial Research for the investigation of the prevention of the ageing and degradation of resin-dentine bonding. This is to be accomplished by feeding minerals back into the collagen network through guided tissue remineralisation (GTR), which is a new nanotechnology process of growing extremely small, mineral-rich crystals and guiding them into the demineralised gaps between collagen fibres.

Dr Tay’s idea originated from his examination of the way crystals form in nature, such as in egg and abalone shells. The crystals, called hydroxyapatite, bond when proteins and minerals interact.

Dr Tay will use calcium phosphate, which is the primary component of dentine, enamel and bone, and two protein analogues, also found in dentine, to mimic nature, while controlling the size of each crystal. In theory, the crystals should lock the minerals into the hybrid layer and prevent it from degrading.

“Instead of dentists replacing teeth with failed bonds, we’re hoping that using these crystals during the bond-making process will provide the strength to save the bonds,” Dr Tay says. “Our end goal is that this material will repair a cavity on its own so that dentists don’t have to fill the tooth.”

According to research presented in the Journal of the American Dental Association, half of all composite resin tooth-coloured restorations fail within ten years, and about 60 per cent of all operative dentistry is conducted to replace them. If Dr Tay’s concept of GTR is successful, he will create a delivery system with which to apply the crystals to the hybrid layer following the acid-etching process.

(Edited by Claudia Salwiczek, DTI)
“These are exciting times in which we live”
An interview with Prof. Thimios Mitsiadis, Head of the Institute for Oral Biology at the University of Zurich, on stem cell research in dentistry

These are exciting times in which we live. It is evident that in the near future—in about 20 to 30 years—we will be able to create new tissue with the aid of microbiology and genetics. Clinical studies that examine the use of dental stem cells for the regeneration of jaw bone are already underway. This is proof that progress in this regard is being made. We just need more information on how to achieve natural protection.

What progress has been made in stem cell research for the formation of enamel?

We recently formed a European consortium with researchers working with stem cells in Germany, Finland, Switzerland, Italy and France. The consortium’s objective is to isolate stem cells from teeth, the face and the head, and to use them to generate products. With stem cells, for example, natural implants could be produced. There are also tests being conducted in Italy to recreate teeth, but in my opinion this is far too complex to be realised at the moment. At this stage, we should only concentrate on creating tissue as a replacement for damaged or destroyed material, such as dentine and dental tissue.

Thank you very much for the interview.

This interview originally appeared in DT Germany No. 4, Vol. 7, 2009. Translation was provided by Annemarie Fischer, Germany.

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Dental CAD/CAM technology offers productivity, increases worldwide

Constantine Gart

New York, NY, USA and Vancouver, BC, Canada: CAD/CAM technology has become one of the most important developments in dentistry today. Especially on the lab side, CAD/CAM technology is expected to increase productivity, enabling labs to meet the growing demands for dental prosthetics and other restorations.

This growth is a result of the aging population and the increasing demand for improved oral aesthetics. CAD/CAM technology has met challenges in satisfying dental laboratories’ expectations of what this technology will bring to their businesses. However, the technology is evolving at a rapid pace, as new trends and technological capabilities are emerging, representing the potential to surpass what it had initially offered dental laboratories.

Zirconia is the primary driver of CAD/CAM adoption, as the material can be milled into a crown or bridge only through an automated device, can be milled into a crown or bridge only through an automated device, and can be milled into a crown or bridge only through an automated device. CAD/CAM technology is becoming more flexible in the type of services that it can offer dental laboratories. This is especially crucial as the number of dental technicians worldwide is projected to drastically decline in the future, due to the large number of older and retiring dental technicians. In addition, there are fewer dental technicians entering this field due to insufficient monetary compensation. This reduction in workforce numbers, coupled with the increasing demand for dental restorations brought on by the aging population, will create greater demands on dental laboratories’ production capacity for prosthetics and other restorations. Dental laboratories in the United States and Europe are also under strain due to competition from countries with lower wages, such as China, Morocco, Turkey and Costa Rica.

The vast majority of dental laboratories around the world employ less than five dentists. Many of these laboratories have hardly enough volume to warrant the purchase of an expensive CAD/CAM system with in-house milling capabilities. To reach the smaller players in the market, CAD/CAM manufacturers such as 5M ESPE, DENTSPLY and Nobel Biocare have offered scanning units to dental laboratories, enabling the labs to scan and outsource the digital restorations to be milled at other locations (either a centralized milling facility or dental laboratories with in-house milling capabilities). This purchasing option allows large dental laboratories that generate sufficient volume and revenue to invest in a full CAD/CAM system with in-house milling capabilities, whereas small to medium-size laboratories improve the option of investing in a lower cost scanning unit, simultaneously eliminating the continuing production costs of dental copings and frameworks. Full CAD/CAM systems typically include one scanner unit and one milling unit-in-house. A stand-alone scanner/CAD/CAM system consists of only a scanner unit, which sends the digital impression to either a centralized milling facility, or a dental lab with milling capability. The growing popularity of the two purchasing options is evident in the US and European markets, as there is an approximate ratio of one full CAD/CAM system to two stand-alone scanners in the two installed bases.

CAD/CAM systems are becoming increasingly more affordable to dental laboratories as their prices continue to drop. For example, in the U.S. market, the average selling prices (ASP) of full systems and scanners are expected to drop at CAD/CAM of 4.8 per cent and 4.3 per cent, respectively.

Manufacturers and distributors are offering financing programs to help laboratories acquire the systems and, in some cases, are giving the system away for free on the condition that the labs manufacture a certain number of proprietary prosthetics. Likewise, the cost of scanners and networked CAD/CAM systems are rapidly dropping; this, coupled with rising gold prices, has reduced the price of a zirconia crown almost to par with a gold crown. This has made zirconia milled frameworks a strong alternative to the traditional gold crown.

There are many dentists that only use PFM restorations and abutments from zirconia. To address this issue, CAD/CAM technology is expanding beyond its initial capability of milling only zirconia material and dental devices, to include other materials, such as non-precious alloys, titanium, acrylic, resin, and even full abutments. This technological capability gives labs greater versatility in meeting customer needs by offering a wider breadth of materials and dental restorations.

The acceptance and integration of CAD/CAM technology into dental laboratories appears to be inevitable. Despite the many challenges that this technology has faced, ranging from uncertainty regarding the viability of zirconia material for dental prosthetics, to the use of technology’s economic feasibility, CAD/CAM technology has progressed and continues to adapt in order to offer greater versatility and services to both small and large dental laboratories.

All implant lines are continuously expanded, improved, and updated to incorporate and accommodate the most current scientific findings in oral implantology. Dr. Ihde Dental also closely co-operates with well-renowned oral implantologist to ensure that their implant meets all the requirements of everyday clinical practice.

All implants are produced in Europe, meeting the most stringent German and Swiss quality standards. Dr. Ihde Dental is present in more than 20 countries through its network of qualified resellers, who, according to Dr. Ihde, are committed to excellent service for their customers.

“We will continue to follow the consistent path of international expansion with a significant investment in key regions for us,” explains export consultant Gert Wieners. “This is why we have decided to present our product range at the FDI World Dental Congress in Singapore this year.”

Visitors of this year’s FDI Congress will find the newest Dr. Ihde Dental at the World Dental exhibition booth #LT 12. More information about the company’s implant lines and other product offers are available at www.dh.de and www.implant.com.

Export consultant Gert Wieners (DTA/Photo courtesy by Dr. Ihde Dental)

Dental CAD/CAM technology offers productivity, increases worldwide

In addition, Dr. Ihde has been specialising in developing and improving the concept of implant dentistry, resulting in several integrated implant lines of basally osteointegrated (BOI) implants and their respective applicative implementations. This implant type is suitable for use in situations with a minimum vertical bone supply, eliminating the need of harvesting bone grafts from the iliac crest, thus performing comprehensive bone augmentation surgery.

The acceptance and integration of CAD/CAM technology into dental laboratories appears to be inevitable. Despite the many challenges that this technology has faced, ranging from uncertainty regarding the viability of zirconia material for dental prosthetics, to the use of technology’s economic feasibility, CAD/CAM technology has progressed and continues to adapt in order to offer greater versatility and services to both small and large dental laboratories.

All implant lines are continuously expanded, improved, and updated to incorporate and accommodate the most current scientific findings in oral implantology. Dr. Ihde Dental also closely co-operates with well-renowned oral implantologist to ensure that their implant meets all the requirements of everyday clinical practice.

All implants are produced in Europe, meeting the most stringent German and Swiss quality standards. Dr. Ihde Dental is present in more than 20 countries through its network of qualified resellers, who, according to Dr. Ihde, are committed to excellent service for their customers.

“We will continue to follow the consistent path of international expansion with a significant investment in key regions for us,” explains export consultant Gert Wieners. “This is why we have decided to present our product range at the FDI World Dental Congress in Singapore this year.”

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Export consultant Gert Wieners (DTA/Photo courtesy by Dr. Ihde Dental)
“We are very pleased with the market launch of NobelProcera.”

An interview with Domenico Scala, CEO of Nobel Biocare

LEIPZIG, Germany/ZURICH, Switzerland: Nobel Biocare, a world leader in restorative and aesthetic dental solutions, provides dental professionals with root-to-tooth solutions, including dental implants, all-ceramic crowns, bridges and laminates, guided surgery planning, scanners, and biomaterials. Dental Tribune Group editor Daniel Zimmermann spoke to Domenico Scala, Nobel Biocare CEO, about current developments within the company and the dental market.

Mr Scala, Dr Rolf Soiron has announced that he will step down as the Chairman of the Board of Nobel Biocare in 2010. What will the consequences of his decision be, and has a choice been made concerning his successor?

Domenico Scala: Dr Soiron announced some time ago already that he would like to withdraw from one of his industry positions. His retirement as Chairman of Nobel Biocare will thus come as no surprise at the upcoming shareholders’ meeting in March 2010. Every business appreciates having a leader with Dr Soiron’s vision and personality at the reins. His decision, however, will have no influence on Nobel Biocare’s current strategy. The board will duly announce a successor.

The last quarterly results were assessed rather negatively. To what extent were these results due to economic factors and to what extent were they due to company management?

Even the dental market cannot remain entirely unharmed by the current economic crisis. This fact has been demonstrated by the economic results of various market participants for several quarters. However, we have worked intensively during the last 18 months to prepare Nobel Biocare for the future. We constantly work at advancing the company, and we steadily invest in research and product development, in order to continue supplying our customers with attractive innovations and treatment solutions.

What have these results given rise to?

We are orienting ourselves towards long-term goals. Our strategic tasks and the needs of our customers have become our focus. Of course, we are also working on our cost structure.

Will the growing markets in Asia or South America be able to absorb the losses of the North American and European markets in the long run, or do you believe the economic situation will show a relatively quick recovery?

I’m hesitant to speculate about the future. Currently, prospects are simply too uncertain. However, we can ascertain that the dental market remains an attractive market with much opportunity in the long-term. We would like to take advantage of this opportunity and are working towards this.

You have just signed an IT services contract with Computer Sciences Corporation (CSC). Are you planning for additional cost cutting?

There is nothing unusual about our collaboration with CSC as our new IT partner, as we have different requirements and demands for our global IT infrastructure to those we had some years ago. Optimising our costs is only one of the advantages.

As a market leader, what is your response to the circulating acquisition rumours?

These rumours have circulated for some years and, therefore, no longer bother us. Rather, these rumours confirm that we all move in an interesting and attractive market. As a matter of principle, we do not comment on speculations and rumours.

You have identified the transformed communication culture as one of the most significant achievement in your work at Nobel Biocare. What insights did you gain during this transformation process, and how was this knowledge implemented?

Customers, researchers and opinion leaders readily collaborate with Nobel Biocare and participate actively and willingly because we listen and have much to offer. Customers return and new clients join us because they are satisfied with our products and solutions and Nobel Biocare’s new direction. This development encourages me to further pursue this innovative direction resolutely. However, we are self-critical and know that we have to improve in terms of customer orientation, which is something that we continue working on.

In the present situation, it is difficult to discuss investment. What are your focal points in the current and following business year?

In these times, we invest in the development of new products and solutions. Last year we invested about €400 million. Our product offensive at Nobel PrograM ensures that dental laboratories are active in the implant segment, in which we are developing innovations. We also invest in the education and training of our personnel and customers.

With the acquisition of Op-timum and AlphaBioTe, you have already responded to changing market conditions. Are you considering further takeovers?

Of course, we constantly investigate interesting offers. However, we have decided not to discuss concrete plans and projects.

How has the market launch of NobelProcera progressed, and what are the most significant advantages of this system in comparison to conventional systems?

We are very pleased with the market launch of NobelProcera. The new optical scanner and the accompanying innovative prosthetics software have been received with significant interest by dental laboratories. The same applies to our considerably expanded product range in the area of prosthetic dentistry. Both dentists and dental laboratories are enthusiastic about the future product range and its quality, which sets new standards.

Which benefits are on offer for the dental therapist and the patient?

From this year on, dentists can choose from an extensive range of treatment procedures, products and materials, in order to provide his or her patient with the optimum solution. Therefore, patients will now receive a custom-made solution with the best possible fit, functionality, and aesthetics.

What is your evaluation of your position in the growing digital dentistry market?

We are well prepared for increasing digitalisation in dentistry, and we intend further improving our position.

Thank you very much for the interview.
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Fixed prosthodontic management of a mutilated dentition: A team approach

Dr. Ansgar Cheng & Dr. Helena Lee
Singapore

Successful full mouth fixed rehabilitation of a mutilated dentition is always a prosthodontic and surgical challenge. Accurate diagnosis, proper treatment planning, prudent choice of prosthodontic materials and meticulous treatment execution are essential for a successful treatment outcome over a long period. The treatment of a partially edentulous oral cavity using a combination of immediate-loading and delayed-loading implant-supported porcelain-fused-to-metal and full-ceramic restorations is presented in this report.

Introduction

Prudent clinical judgement and careful balancing of the risks and benefits of various treatment options are essential for a predictable long-term treatment outcome for prosthodontic treatment. It is known that loss of the vertical dimension of occlusion (VDO) may pose significant clinical difficulties in prosthodontic treatment. The clinical procedures for the re-establishment of a new therapeutic vertical dimension of occlusion is seldom taught in undergraduate dental curricula. VDO is defined as the superior-inferior measurement between two points when the occluding elements are in contact. Various methods have been proposed for the clinical assessment of the VDO. Loss of the tooth structure does not necessarily equate to loss of the VDO, as the VDO may be maintained as a result of compensatory dental eruption. When the clinical loss of the VDO is small, accurate diagnosis can be difficult. In this case study, the management objective was to determine whether there was any need for the re-establishment of the VDO in the case of small loss and whether the proposed change in the VDO was clinically acceptable. When the loss of the VDO is small, any change in the VDO should be based on the amount of interocclusal space required to restore the dentition to proper form and function. A significant alteration of the VDO should be approached with care, and unnecessary, excessive changes of the VDO should be avoided. In general, a significant change of the VDO should be monitored over an extended period.

Improvements in macroscopic implant morphology and surface treatments have led to the reduction of healing time and the concept of immediate loading of implants. Early implant loading is a successful protocol in selected cases. Providing that sufficient bone volume is available, flapless surgical implant placement is predictable and patients experience minimal post-surgical discomfort.

The posterior maxilla presents a unique challenge to implant placement when minimal bone height remains inferior to the sinus floor. Pneumatisation of the maxillary sinus occurs after extraction of molars. In addition, the posterior maxilla has poorer bone quality, mainly Type IV bone.

Placement of implants in grafted bone sites has a high success rate of osseointegration. Several authors have reported an approximate 92 per cent success rate of implants after sinus augmentation. However, immediate implant loading under such conditions is generally avoided. The low failure rate may be attributed to the placement of implants of greater lengths in grafted bone sites.

This case study describes the team approach management of a mutilated dentition, using different types of composites.

Fig. 1: Pre-treatment intra-oral frontal view, presenting with attrition, loss of posterior support, reduced VDO and compromised aesthetics. — Fig. 2: Pre-treatment intra-oral occlusal view of the maxilla, showing dental attrition and inadequately restored molars. The orthodontic arch wire was broken. — Fig. 3: Pre-treatment intra-oral occlusal view of the mandible, showing dental attrition and inadequately restored teeth. A few of the orthodontic brackets were debonded from the mandibular incisors.

Fig. 4: Pre-treatment orthopantomogram X-ray showing adequate endodontic fillings, over-eruption of maxillary molars, inadequate occlusal support and inadequately restored teeth. Posterior mandible bone bed was diagnosed as Type 2B.
Influence of surface properties on osseo-integration

A biomechanical and histological study in the rabbit

Jan Gottlow, Sargun Barkerno & Lars Sonnerby
Sweden

The first objective of the present study was to compare shear strengths at the bone-implant interface between the SLActive implants and the TiUnite implants. The second objective was to compare the bone-to-implant contact between the two different surfaces. The hypothesis of the study was that SLActive implants would promote a superior osseointegration to the TiUnite implants, as evaluated by biomechanical and histological means.

Thirty rabbits with a minimum age of three months were chosen for the study. Two test implants (Standard Plus, Ø 4.1 mm, RN, SLActive, 8 mm) and two control implants (Re-place Select Taper, Ø 4.3 mm, TiUnite, 10 mm, corresponding to 8.5 mm Ti-Unite) were inserted in the tibia, and one test and one control implant were inserted in the femur. The left and right side were randomised for test and control implants. Ten rabbits per time point were evaluated after ten days, three weeks, and six weeks of healing. Ten test and control implants per time point placed in the tibia were subject to shear-strength testing. Thereby, the removal torque values were measured, and the shear-strength values subsequently calculated. Histomorphometrical investigation was performed on all implants.

At ten days of healing, the SLActive implants yielded higher mean shear-strength values than the TiUnite implants without statistical significance. At three weeks and six weeks of healing, the SLActive implants yielded higher mean shear-strength values than the TiUnite implants (Fig. 1) with statistical significance.

The histomorphometrical investigation for the second objective of the study is still in progress. Thus, far, this study strongly suggests that the interface shear strength of titanium implants is significantly influenced by their surface characteristics. The SLActive surface demonstrated higher shear strength with statistical significance in the tibia of rabbits compared with the TiUnite surface at three and six weeks after implant placement.

Fig. 1: Shear strength (N/mm²) after ten days, three weeks, and six weeks after implant placement.

*p ≤ 0.001 after three weeks
p ≤ 0.002 after six weeks
Margins of the tooth preparations were kept supra-gingival, and no gingival displacement procedures on the prepared teeth were necessary. Upon completion of the crown preparations, six endosseous implants (Nobel Replace, Nobel Biocare) were placed by the periodontist in the posterior mandible using a flapless surgical protocol. All implants were placed with 45 Ncm insertion torque (Fig. 5). No surgical template was used during the surgical phase; the prosthodontist was present during the implant surgery to ensure implant placement was prosthodontically acceptable.

Pick-up type implant impressions (Nobel Replace, Nobel Biocare) were attached to the newly placed mandibular implants. High-viscosity vinyl polysiloxane material (Aquasil Ultra Heavy, DENTSPLY DeTrey) was carefully injected onto all tooth preparations and trayed. Stop impregnated putty material (Aquasil Putty, DENTSPLY DeTrey) was custom milled for mandibular restorations with porcelain occlusal surfaces. Prefabricated abutments (Nobel Replace, Nobel Biocare) were custom milled with a six-degree taper in the dental laboratory to facilitate the development of the restorations. Splinted, cement-retained, implant-supported mandibular restorations with porcelain occlusal surfaces were made of porcelain fused to metal material. The development of the definitive crown restorations was carried out as usual on the definitive casts. Except for the maxillary right molars, all maxillary and mandibular crowns supported by natural teeth were restored with Cercon (DeguDent) full-ceramic crowns. Full-ceramic restorations (Aquasil Putty, DENTSPLY DeTrey) were placed in the maxillary posterior area. The development of the definitive porcelain-maxillary impression was made in the usual manner, a centric relation record was made with a vinyl polysiloxane material (Regisil PR, DENTSPLY DeTrey).

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The definitive crown restorations were cemented in the maxillary asparch. In the presence of the prosthodontist, three endosseous implants (Nobel Replace, Nobel Biocare) were placed by the periodontist in the right maxillary premolar area. The insertion of crowns was followed by implant placement in the maxillary arch. The definitive crown restorations were cemented in the maxillary arch. In the presence of the prosthodontist, three endosseous implants (Nobel Replace, Nobel Biocare) were placed by the periodontist in the right maxillary premolar area. The insertion of crowns was followed by implant placement in the maxillary arch. The definitive crown restorations were cemented in the maxillary arch.

On the day of restoration delivery, the mandibular implant abutments were torqued down to 52 Ncm. The abutment screw holes were sealed with gutta-percha (Mynol, Block Drug Company). All the definitive crowns were cemented in resin-modified glass-ionomer luting agent (RelYx Unicem, ESPE). The insertion of crowns was followed by implant placement in the maxillary arch.

In the presence of the prosthodontist, three endosseous implants (Nobel Replace, Nobel Biocare) were placed by the periodontist in the right maxillary premolar area. The insertion of crowns was followed by implant placement in the maxillary arch.

The treatment required a small increase in the VDO. It was therefore necessary to make impressions that registered all tooth preparations simultaneously. The patient desired a high level of aesthetics; full-ceramic restorations were chosen for the anterior teeth. As the minimum core thickness for this full-ceramic system is 0.4 mm, this enabled conservation of tooth structure while achieving excellent aesthetics.

Traditional porcelain-fused-to-metal anterior crown restorations require the placement of labial crown margins within the gingival sulcus, in order to mask the transition between the root surface and the porcelain-fused-to-metal restoration. By prescribing full-ceramic restorations, intra-sulcular placement of crown margins on the labial surface becomes less important from an aesthetic standpoint. In this report, the cervical tooth structure of the anterior teeth was free of caries, teeth preparation margins were made at the gingival level and gingival retraction procedures were eliminated. As gingival retraction cord packing was not required, mechanical trauma to the gingival tissues was reduced and significantly less clinical time was required. This is particularly beneficial for individuals with thin gingival biotypes.

Porcelain-fused-to-metal restorations were used in the posterior teeth because of the well-documented long-term clinical track record of this restoration. In order to maximize the aesthetic outcome, porcelain occlusal surfaces were prescribed.

Conclusion

The clinical management of an aesthetically demanding, complex functional prosthodontic rehabilitation is a clinical challenge. The use of full-ceramic restorations and porcelain-fused-to-metal restorations with porcelain occlusal surfaces enhances the overall aesthetic outcome, as well as functional predictability. Various surgical and implant-loading protocols were used, to ensure optimal results.

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

About the authors

Dr Ang Kang Cheng obtained his dental training from the University of Hong Kong, his prosthodontics specialty training from Northwestern University, USA, and his Certificate in Maxillofacial Prosthodontics from UCLA, USA. He is a Consultant Prosthodontist with Specialist Dental Group in Singapore. Dr Cheng can be contacted at drc@specialistdentalgroup.com.

Dr Helena Lee obtained her dental training at the National University of Singapore and her periodontics specialty training from the University of London-Eastman Dental Institute, UK. She is a consultant periodontist with Specialist Dental Group in Singapore. Dr Lee can be contacted at drlee@specialistdentalgroup.com.

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Managing oral health for good quality of life

Dr Stuart Smith has worked as a dentist and teacher in several dental hospitals and schools in the UK. In recent years, he became Vice President of Global Dental Scientific and Professional Communications for GlaxoSmithKline (GSK), a large multinational pharmaceutical company with an extensive consumer healthcare division. DT Asia Pacific editor Claudia Salwiczek spoke with Dr Smith about GSK’s approach to oral care management.

Claudia Salwiczek: Dr Smith, GSK is developing solutions for the oral health management of customers throughout the world. In your opinion, what impact do oral diseases have on people’s lives?

Dr Stuart Smith: Oral diseases can have a massive and varied impact on the lives of individuals, families and communities. Dental caries has been declining in many markets but remains a significant problem around the world not only causing pain for individuals but also days of schooling for children and work days for adults. Gum diseases remain a common issue for tooth loss which in turn can have a dramatic impact on someone’s self-esteem. There is increasing consumer interest in the links between oral health and systemic health and the role that oral hygiene may have in the process. Other oral diseases, such as dentine hypersensitivity and xerostomia, can also impact and individually’s quality of life with patients having to modify the way they live their lives to cope with the condition.

You have been with GSK for 15 years. How does your work routine in a corporate environment compare to your university experience?

Dr Stuart Smith: Much of the work is very similar; the objectives of dental academic researchers and industry are very closely aligned. Both are looking at how a successful product brings them to market. (Editorial note: For more information, please visit www.innovation.gsk.com.)

Where does the consumer factor in this process?

Dr Stuart Smith: Consumers increasingly not only want to be healthy but also want to feel better and live longer. Within the GSK company mission, “The GSK company mission is to help people to do more, feel better and live longer.”

Claudia Salwiczek: How does your work in this area differ from other related disciplines?

Dr Stuart Smith: It certainly seems that the world in general is becoming a smaller place. Whilst historically most R&D has been conducted in Europe and USA it is now becoming much more evenly spread throughout the world. GSK consumer healthcare has now established R&D facilities and capabilities in India and China and are constantly seeking ways of building collaborative relationships in Asia to ensure we capitalise on the scientific expertise and capabilities in this region.

Thank you for this interview!  
Dr Stuart Smith can be contacted at stuart.r.smith@gsk.com.
“Most people are worried it is often something worse.”

Dr Nick Rote. East Finchley, UK

1 in 3 people suffer from dentine hypersensitivity and over 50% of sufferers don’t mention it to their dental professional. Research shows that this may be because they fear it requires major dental work, the pain may be variable so they don’t report it or because they may be using techniques to try and avoid the pain.

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“When they come back to see me next time, they’re very pleased that the solution was given to them so easily.”

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Sub-gingival biofilm: A therapeutic challenge

Minimally invasive biofilm management in periodontal recalls

Dr. Clemens Walter & Dr. Beate Mohr
Switzerland

The primary goal of periodontal-therapeutic methods is to introduce a need-oriented individual oral hygiene and to enable and maintain perfect supra-gingival plaque control. After systematic sub-gingival instrumentation of the diseased periodontium, regular mechanical removal of the sub-gingival biofilm by a dentist or a dental hygienist is required. This combination is considered the ‘gold standard’ in periodontal treatment and with consistent application can maintain periodontal health over several decades.

A basic condition for the formation and progression of periodontal disease is an opportunistic infection that is mostly poly-microbial with pathogenic micro-organisms of the oral biofilm. Biofilm is an organised microbial accumulation on a humid surface (Fig. 1). This multi-layered structure protects bacteria from the immune system of their host and from anti-microbial agents, such as local and systemic antibiotics.

No scientifically proven alternatives to the mechanical removal of oral biofilm have been found to date. The organised bacteria do not only operate directly. Damage to the periodontium is inflicted, without bacterial invasion, in the corresponding compartments of the periodontal apparatus through the host’s immune reaction to the bacterial stimulus.

The progression of the disease, which varies from individual to individual, is determined by genetic, acquired and partly-modifiable risk factors.

Invasiveness of the instrumentation

Currently, several established and new, innovative instruments are available for the removal of the sub-gingival biofilm, as well as the scaling and root planing of the diseased periodontium. In addition to the removal of biofilm, the establishment of a bio-compatible root surface (even, hard and decontaminated) is a priority during initial instrumentation. For this, hand instruments, such as gracey curettes (Fig. 2) and ultrasonic scalers with diamond tips, are indicated.

However, there can be several undesirable side effects with such a course of treatment. Patients often find the instrumentation of the diseased periodontium an unpleasant experience. Moreover, gingival recession may occur as a result of the treatment, which can lead to aesthetic impairment and dentine hypersensitivity. Long-term treatment of the root surface contributes substantially to the erosion of enamel, which can result in long brittle teeth.

During initial sub-gingival instrumentation, all concretions and calculi should be removed as far as possible. Supportive periodontal therapy (SPT) of the periodontium entails removal of the biofilm. Accordingly, minimally invasive and patient-friendly procedures like biofilm management are favoured in SPT (Fig. 5).

Air-abrasive polishers in periodontal therapy

In recent years, scientific interest has centred around the development of air-abrasive polishers for supra- and sub-gingival application. These systems use a mixture of an abrasive powder and water blasted onto the surface of the tooth. Application angles vary depending on the type of unit.

Initial variants using sodium bicarbonate or aluminium oxide powder were not approved for sub-gingival instrumentation. The application of sodium bicarbonate with a grain size of 250 µm resulted in massive dentine and cementum damage. In addition, trauma of the gingiva was observed.

The high degree of abrasiveness of these materials required the development of...
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new air-powder polishers, especially for sub-gingival application. The development of new air polishers focused on the reduction of the grain size and sub-gingival application through a special attachment.

The new generation of air-abrasive polishers

The recently launched glycine-based powder Air-Flow Powder Perio (EMS, Switzerland) with a grain size of approximately 25 µm (d 50) allows sub-gingival instrumentation without damage to the cementum or gingiva. The powder-air mixture and rinse water are introduced sub-gingivally with a fine, flexible attachment. The triple-injector system causes spinning at the application site, which extends the effective range (Fig. 4). A follow-up polish of the instrumented surfaces with rubber cups is often unnecessary, owing to this powder’s reduced abrasiveness. The nozzle is for single use only.

Options for supra-gingival and sub-gingival application have been combined into one single device (Air-Flow Master, EMS, Fig. 5). Based on indication and the required abrasion, users can select various powder grain sizes:

• A Sodium bicarbonate-based powder (Air-Flow Powder Classic) with a grain size of approximately 85 µm (d 50) and rounded particles with a smooth surface is recommended for supra-gingival cleaning and in cases of difficult access.

Evidence and first personal experiences

A recently published clinical study has shown promising results regarding the efficiency of Air-Flow applications containing glycine in SPT. According to the results, gentle and quick removal of the sub-gingival biofilm is possible up to a pocket depth of 4 mm. Significant irritation of the marginal gingiva was not observed. Surprisingly, patients found the instrumentation using air abrasion a more pleasurable experience than instrumentation using traditional methods.

The first clinical experiences in Basel confirmed a high acceptance rate amongst patients. The procedure with minimally abrasive glycine powder is especially recommended for patients diagnosed with periodontitis with minor dental calculus formation. Closed or open peri-implantitis therapy is a further indication for treatment (Fig. 6).

Before treatment, the patient should be protected with safety glasses, protective attire and a sufficient layer of Vaseline on the lips. A prudent suction of the aerosols by the dental assistant further protects the patient and facilitates treatment. Access to higher pocket depths is critical and could be improved with the introduction of a more gracile and rigid nozzle.

To summarise, it can concluded that at present minimally abrasive powder-air mixtures are a good alternative for SPT, owing to their low damage potential for periodontal tissue and high patient acceptance rate.
Matthias Kaiser was an English and French language teacher before becoming CEO of Kaiser Dental Laboratory in Germany. Today, he leads a team of four dental technicians in Singapore that produces and delivers dental prostheses for dentists in Asia and Europe. Dental Tribune Group Editor Daniel Zimmermann spoke with him about the working conditions in Singapore and his opinion of the dental laboratory market in Asia.

Daniel Zimmermann: Mr. Kaiser, where did the idea of establishing a dental laboratory in Singapore originate?

Matthias Kaiser: The idea came from my brother Christoph, who was hired by a French dental laboratory in the mid-1980s but was dissatisfied with quality standards. With his wife Farida, he founded the Kaiser Dental Laboratory in Singapore in 1987. We later followed with proDentum in Berlin for sales in Germany.

Quality standards in technology and service were more important to us than being the cheapest supplier in the market. Throughout the years, this concept has brought us a very stable business. We have seen many competitors copying our concept and constantly looking for favourable locations throughout the region; however, they still buy work that is more sophisticated from us.

Since the 1990s, a number of Asian countries, such as Singapore or Indonesia, have experienced considerable economic growth rates. What impact have these developments had on the dental market?

Dentistry is and will remain primarily a handcraft. Large entities like in other manufacturing areas, such as the textile industry, are not imitable. Even though there are quite a number of large laboratories in China, individual training and technical routine remain a problem. In the last couple of years, all other international laboratories have left Singapore and are now producing in China or Vietnam. However, conditions and quality standards in these countries vary to a high degree.

In a recent interview with DT Asia Pacific, the president of STD Lab Management in Beijing estimated that there are 5,000 dental laboratories in China. What is your opinion of this potential?

It is a question of quality and demand. In China, everything is mass-produced, but everyone who purchases dental prostheses in that country will soon realise the importance of quality and how difficult it is to retain quality in mass production. I think that Chinese laboratories will be producing for the expanding middle class in the country itself.

Have you thought of entering the Chinese market?

Of course. When you receive an offer to buy an all-ceramic restoration for only €8, you start thinking about this option. However, when you see the product itself, you know that the purchasing of dentures cannot be approached in the same manner as the purchasing of fabrics. We are patiently waiting for costs to explode in China. Then, we would be on the same technological level again but more advanced in terms of organisation and marketing. The current trend shows that our view on this is on the right track.

How do the working conditions in Singapore compare to those in Germany or Europe?

A well-trained dental technician in Singapore can earn as much as a technician in Berlin or any other part of Europe. Although we have experienced an increased cost of living in recent years, efficient labour organisation, the optimal utilisation of resources, and very low ancillary labour costs make production here still attractive, so patients in Germany and other countries can save a lot. As our laboratory in Singapore is certified by the German Technical Supervisory Association (TÜV), the basic conditions for production are more or less the same as those in Germany.

Which markets do you primarily serve?

Approximately 70 per cent of our prosthetic work goes to Germany and Austria, and 10 per cent to Norway and the Netherlands. The 20 per cent remainder goes to the fastest growing markets of Singapore and its neighbouring countries, where high-quality dental laboratory work is in demand.

Do you offer your services via established distribution structures or via the Internet?

We usually take the established routes because our efforts to install an IT-based processing system have failed in Singapore from Germany here and so we would like to hire German dentists. Unfortunately, the Singapore Dental Association is refusing to give us permission to hire them, even though we have already received applications from highly-qualified applicants. But we will continue to work on this matter.

Singapore has recently become a strong player in the medical and dental tourism market. Do you intend to participate in this market as well?

We believe that this could be a good investment, although only a few people would be willing to travel from Europe to Singapore. What we cannot predict at the moment is whether patients from more developed countries in the region will come to Singapore to seek dental treatment. The number of enquiries from Indonesia or Malaysia is noticeably growing. Meanwhile, we are looking for investors who would like to participate in the clinic’s expansion and support our marketing campaigns. And we are looking for Singaporean dentists who speak German well!

Are you planning any special activities for the FDI Congress?

Instead of distributing pictures and brochures, we invite all dentists to see our laboratory facilities ‘in action’ and to speak with our dental technicians and management about possible collaboration. Whoever is interested can just contact us; we’ll pick her or him up at the hotel and bring her or him back to the hotel again. Our staff speak Mandarin, Malay, English and German.

Thank you very much for the interview.
Complications and risks

Preliminary remarks

The use of miniscrews facilitates many aspects of orthodontic treatment and in some cases actually makes such treatments possible. But miniscrew-based treatments, in common with all medical procedures, are not without their problems, complications and risks. It should be borne in mind that medical progress is only possible thanks to the pioneers and patients who are willing to enter uncharted regions. The major phase of miniscrew trials began in 2000. Today, the use of miniscrews is becoming increasingly established and consolidated, which means that the potential and limitations of miniscrews are also ever more apparent.

Miniscrews—a focal point in practice

Six-part series by Dr Björn Ludwig, Dr Bettina Glasl, Dr Thomas Lietz & Prof. Jörg A. Lisson—Part VI

Fig. 1: There are many possible causes of the premature loss of miniscrews. The most common of these are practitioner-related.

Fig. 3: Classification of bone quality according to Misch

Class D1
AIrtooth (endosteal, endosseous, compact bone)
Articular surface, parietal max., parietal mandib.

Class D2
Thin, compact bone (endo-osseous

Class D3
Thick, compact bone (endo-osseous

Class D4
The compact bone of the parietal

Bone quality

Objective reasons

Indicative problems

Patent

Pre-operative causes

Post-operative causes

Influence of practitioner

Screw failure

Infection/Atraux

Insertion process

Infection

Experience

The best site for the screw should be selected on the basis of the biomechanical concept. The following should be considered:

• There should be at least 0.5 mm bone around the screw on all sides.
• The screw head should be positioned on inflammation-free, unattached gingiva.

It is most important to determine the quantity and quality of the bone at the selected site of insertion. This will provide initial indications of the quality to be expected (Fig. 2). However, an X-ray will only provide limited information in this respect, although it will make it possible to assess the spatial situation in two dimensions. This prevents or reduces the risk of damaging a root (Fig. 7).

In the case of X-ray plates (particularly dental films), the direction of exposure, distortions arising from this and the possible loss of information must all be taken into account (Figs. 4a & b). The spatial situation can also be assessed by reproducing the midsagittal line, the tooth axes and roots on a model (Fig. 5). Information on the maximum length of screw that can be used can be obtained by measuring the model along the insertion axis (Fig. 6a).

Insertion

The first question (taking into account possible complications) is who should insert the screw? There is much in favour of this being done by the orthodontist. Studies have shown that orthodontists have a far better developed sensitivity in this regard. There is often failure—in other words, the loss of the miniscrew—if this is under-taken by ‘experienced’ implanters because they tend to ignore or be insufficiency aware of the requirements for the insertion of a miniscrew.

If the orthodontist is not to insert the miniscrews personally, a good line of communication with the surgeon must be maintained.
Overview 1

Local contraindications:
- Quantitative and qualitative deficiency of bone at the insertion site
- Incision
  - in the mobile mucosa
  - on the lingual side of the mandible
  - non-inflammation wounds
- Dental follicles or deciduous teeth
  - Poor oral hygiene
  - Recent disorders of the oral mucosa
  - Oedema
  - Radiotherapy of the cranial region

General contraindications:
- Compromised immune system
- Therapy with corticosteroids
- Uncontrolled endocrine disorders
- Rhabdomyosarcoma
- Dislocation of the skeletal system
- Hepatic cirrhosis

Overview 2

Miniscrews with depth stop

<table>
<thead>
<tr>
<th>Name of screw</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abutment Screw</td>
<td>PDT Anchor Screw</td>
</tr>
<tr>
<td>Implant Screw</td>
<td>DT Screw</td>
</tr>
<tr>
<td>Mini Implant Screw</td>
<td>S. I. N. - Implant System</td>
</tr>
<tr>
<td>S. I. N. Screw</td>
<td>S. I. N. Screw</td>
</tr>
<tr>
<td>Cortical Screw</td>
<td>Carnot Screw</td>
</tr>
<tr>
<td>Tomax Screw</td>
<td>Tomax Screw</td>
</tr>
</tbody>
</table>

* Screw type: system 1.6 and one-point head
** as suitable for form of insertion

Otherwise, there is a risk of problems if the tooth is insufficiently inserted or incision wounds are not deep enough and thus ineffective. The correct position for the screws would have been between teeth 5 and 4. This problem arose because of anatomical factors, such as bone thickness and/or bone quality. Inadequate primary stability is mainly due to the cortical layer (Fig. 2). The Figs. 6b-8c demonstrate that there is no empirical evidence to confirm this.

The fracture of a miniscrew is a rare occurrence. The following parameters (alone or in combination) determine the risk of fracture:
- Screw design: thin screws (8x0.4 mm) and long screws (>10 mm) tend to fracture more easily
- Anatomical factors
- Thick cortical layer (>2 mm) without perforation
- Insertion conditions: too much torque and/or inconsistent rate of insertion

Many problems arise because of inadequate training or lack of experience. There may well be a higher rate of failure after the first to ten miniscrew treatments performed by an individual. The personal learning curve can be vastly improved by practising on porcine bone samples (Fig. 8). Various clinical situations can be simulated (bone quality, effect of drilling etc.). This training gives the individual the necessary ‘feel’ for bone and screw. In order to minimise potential risks, particularly during insertion, it is advisable to adopt a standardised procedure for routine use.

Primary and secondary stability

The primary stability of a miniscrew in the bone must be good. Screw stability is mainly determined by the cortical layer. The screw elements inserted in the bone contribute little towards screw retention. The reasons for poor primary stability are:
- Inadequate bone material quality/quantity
- Overlarge bore hole due to incorrect drilling technique (e.g. repeated insertion of the drill in the hole, deviation from required axis)
- Unsuitable screw thread (design of flanks and distance between them: relation of shaft to external diameter)

A miniscrew must have primary stability immediately on insertion, as stability cannot be subsequently achieved. If this is not the case, it is best to remove the screw and select an alternative insertion site where the prerequisites are better.

The regeneration of the bone tissue required to achieve second
Inflammation

There is a high probability that a miniscrew will fail if peri-mucosal implantitis develops. It is thus important to ensure that the patient is appropriately informed (which includes instructions on oral hygiene) and that follow-up is possible. During follow-up, examination of the screw (status of the surrounding tissue, stability of the screw) should be carried out. The positioning of attached elements (springs, extension arms) may cause the development of pressure sores or even ulceration of the mucosa. This is something that should also be monitored and treated as necessary.

Oral hygiene

The patient must ensure that adequate hygiene is maintained in the area around the miniscrew. A normal toothbrush should be used for this purpose. There is evidence that electric toothbrushes, particularly those with rotating heads, can loosen miniscrews, which can cause failure. In addition to the cleaning technique itself, the frequency and intensity of cleaning are undoubtedly also important. Very frequent cleaning that results in persistent micro-movement of the screw could well be disadvantageous.

Liability insurance

In cases in which an orthodontist who wishes to insert miniscrews themselves in their practices is frequently unsure about aspects of indemnity insurance. Policies available cover claims ranging from €1.5 to €5 million. When deciding on the extent of cover required (and thus the premiums that will need to be paid), the particular circumstances of the practice need to be considered. An indemnity insurance policy will also cover the practice’s personnel but exclude temporary employees. If there are any changes to the activities profile in the practice, the owners should verify that this is covered by the policy. The insurer will be happy to clarify this. There are insurance companies that do not differentiate between dental practices and orthodontic practices as far as their policies are concerned.

In order to protect themselves in such cases, insurance companies that do not specifically cover surgical or implant procedures. In this case, the annual premium is likely to be increased by €20 to €50 (applicable at time of writing, June 2007). In order to protect themselves should a claim of negligence be made, orthodontists should ensure that they follow certain basic rules.

Duty of information

Prior to beginning any procedure, the patient must be informed of the nature and effect of potential risks, of alternative treatments and of the consequences of no treatment were to be provided. It is a good idea to use pre-printed material to gather information on medical history and provide information. These facts as an aide-memoire or prompt when introducing the patient. Written material should not be used to replace personal dialogue. The printed material used must document (e.g. in the form of a note) that the relevant verbal information has been given to the patient. It is not enough to have the signature of the patient, a witness and the practitioner.

Documentation

Documentation is an absolutely essential aspect. Treatment records (patient card, X-ray plates, cephalographs and models, treatment notes and medical records etc.) must clearly document the course of the procedure and all problems or complications. Lawsuits are often lost owing to incomplete documentation. Legal disputes are often lost owing to incomplete documentation. Legal disputes are often lost owing to incomplete documentation.

Insurance claims

If a patient suffers an injury or registers a claim, it is advisable to contact the policy provider. The insurer will supervise all the financial and legal aspects.

Summary

The main parameters that determine the clinical success of a procedure are the bone quality and space available at the planned insertion site, the use of an inser-
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“Children are the best messengers for introducing behaviour change into family life”

An interview with Bella Monse about the ‘Fit for School’ initiative in the Philippines

The ‘Fit for School’ initiative in the Philippines began in 1998 as a small-scale project in Mindanao, one of the southern Philippine islands, incorporating 20 schools and focusing on oral-health education and dental treatment. Since then, it has developed into a registered NGO committed to supporting government and non-government agencies in conceptualising, implementing, monitoring and evaluating school health programmes. Dental Tribune International Group Editor Daniel Zimmermann spoke with Dr Bella Monse, a former dentist and now consultant of the German Development Corporation (GTZ) in the Health and Nutrition Section of the Department of Education in the Philippines, about the programme and how could it be helping to improve the oral health status of children throughout the Asia Pacific region.

Daniel Zimmermann: Ms Monse, you are going to introduce your country’s Fit for School Health Programme at the World Congress on Preventive Dentistry in Thailand. Could you please explain what the programme does?

Bella Monse: The NGO ‘Fit for School’ supports the health and education sector in the Philippines in institutionalising an Essential Health Care Package for Filipino Children. This package implements daily hand-washing with soap and tooth-brushing with fluoride toothpaste, as well as biannual deworming, as an integrated part of the public school system. Children are the main actors as they carry out the activities in the same organised manner, like the daily flag ceremony, under the leadership of classmates as group leaders. This daily routine in schools is familiarising children with healthy habits and may induce long-term behaviour change in family life.

What are the main advantages of an integrated school health programme? In countries where diarrhoea and respiratory tract infections are still the major cause of death amongst children, two-thirds of the children are infected with soil-transmitted parasites (common worms), and virtually all children suffer from untreated dental caries, improvement in personal hygiene, focusing on hand-washing and tooth-brushing is the base for any health-care programme. Integration of oral health care into general health care will mainstream advocacy, pool resources, avoid overlap and simplify health programmes.

“The oral-health status of children in the Philippines is in an alarming state”

The latest National Oral Health Survey has revealed that 97 per cent of first-graders in public schools in the Philippines suffer from tooth decay. The oral-health status of children in the Philippines is in an alarming state, and this is true for other countries in Asia as well. In the Philippines, caries amongst public school children remains completely untreated, leading to unnecessary pain and intra-oral infections. The National Oral Health Survey revealed that six-year-old children had on average nine decayed teeth in their mouth with 40 per cent of these teeth presenting caries with pulp involvement.

Twenty per cent of six-year-old children also reported toothache during the time of the survey and the condition is the main reason for school absenteeism in the Philippines. We have developed an index to measure the consequences of untreated caries – the PUFA index – which will be presented during the World Congress on Preventive Dentistry in Thailand.

What are the reasons for the neglect of oral health care and are there regional differences? The main reasons are an unhealthy diet and lack of access to appropriate levels of fluoride. Daily tooth-brushing with fluoride toothpaste is not yet a habit for the majority of Filipino children in their family life. The National Oral Health Survey found the highest caries levels in highly urbanised areas and easily accessible areas (near high-streets), where money for soft drinks and junk food is available, while caries levels in remote areas are lower, most probably owing to traditional nutritional habits.

The ‘Fit for School’ programme recommends simple interventions such as brushing teeth with fluoride toothpaste. Why can these measures not be implemented in children’s homes? During the last decades, the Department of Education has run health-education programmes promoting a healthy diet and daily tooth-brushing and giving advice to visit the dentist twice a year. However, despite these efforts, children are eating junk food, not brushing their teeth and not visiting dentists. And how can children do so, if regular tooth-brushing is not a habit in family life, if toothbrushes and toothpaste are not available, and if there is no money to go to the dentist, even if children have toothache? Schools are the most effective places to introduce change, as children spend the majority of their day with their classmates and the teacher. Children are the best messengers for introducing behaviour change into family life.

The programmes are aimed primarily at school children. Yet, figures from watchdog organisations for children’s rights estimate that 16 per cent of young children in the Philippines work and thus do not attend school.

This is a sad fact and the real figures are even higher. Only about 60 per cent of children finish elementary school. All efforts have to be increased to achieve universal primary education, helping and encouraging parents to send their children to school.

You recently completed the first pilot programmes. What was their outcome? These pilot programmes have already been scaled up to national policy and currently more than 650,000 children are enrolled in the programme. We expect that at the end of the school year 2009/10 more than a million school children will participate in the programme. With regard to the institutionalisation process, one of the most important outcomes of the pilot phase was the need for clear policies, mandating teachers to supervise the daily routine of hand-washing and tooth-brushing and integrate these into daily school activities. We also learned a lot concerning partnership with the parents and
teachers’ association and community involvement, which is essential for the construction of hand-washing and tooth-brushing facilities.

With regard to the health outcomes of the interventions, hand-washing with soap has proven around the globe to be the most effective health care intervention in halving the occurrence of infectious diseases (specifically diarrhoea and respiratory infections). Our research has shown that daily fluoride tooth-brushing reduces the caries increment by 40 per cent and progression into the pulp by 60 per cent, while international published data on mass deworming of children provides the evidence for improved nutritional status and academic performance.

Education Secretary Jesli A. Lapus has announced plans to extend the programme to six million children by the end of 2010. Is this a realistic target?

The Philippines Education Secretary is actively promoting this programme, and he is accorded much attention within the Philippines and in the Asian region, especially in light of the H1N1 pandemic, for which hand-washing is important as well. The compelling concept of the ‘Fit for School’ programme, addressing high-impact childhood diseases in a comprehensive, yet simple, and cost-effective package, provides the backdrop for high expectations for a fascinating public health success story. We aim to reach six million children, which is nearly 50 per cent of public school children, by the end of 2012. Backed by national and international health policies, ample evidence on effectiveness, clear implementation strategies and support from influential partners, this is a realistic target.

Dental hygiene has to be maintained throughout life. Do you expect the programme to have any long-term effects or is there need for further oral health promotion programmes later in life?

Children are performing daily tooth-brushing in school and we expect that this will lead to lifelong behaviour change. It is known that children are the best messengers and agents of change for promoting and introducing behaviour change in family life. Limited data is available to answer this question, but promising results from research conducted in Scotland amongst high-risk children showed long-lasting effects, evidenced by a reduction in caries increment of 50 per cent compared with control children four years after the termination of a school-based fluoride tooth-brushing programme. We are just starting a comprehensive research project to evaluate the programme in terms of health outcomes, academic performance and behaviour change.

“Countries that want to implement similar programmes have to focus on prevention and behaviour change.”

You said before that many countries in Asia demonstrate similar oral-health patterns amongst their youth. What lessons can your programme provide for countries that aim to implement similar programmes in their schools?

Countries that want to implement similar programmes have to focus on prevention and behaviour change. Only a few evidence-based interventions, which governments can afford for all children, are necessary for an essential school health package that answers to the demand and the local conditions of the public school system in their respective countries.

Thank you very much for the interview.

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