EAO Annual Scientific Congress 2015 · Stockholm · 24–26 September, 2015

Independent news for visitors and exhibitors

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On Friday, Prof. Martin Schimmel will be discussing some of the challenges related to treatment of the elderly. *today* spoke with him about these issues and the importance of offering this vulnerable population the benefits of implant therapy.
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New products in focus
The 24th Annual Scientific Meeting of the European Association for Osseointegration is an excellent opportunity to see state-of-the-art technologies in the field of dental implantology.
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2015 Annual Scientific Congress of the EAO continues

Still plenty to see and discover at Stockholmmässan


© Stockholmmässan

After a promising start on Thursday, participants of this year's EAO Annual Scientific Congress can look forward to another two days of dental excellence and learning. Starting off the programme on Friday are two parallel sessions on implant treatment of the elderly and the use of CAD/CAM in implant treatment, followed by two major sessions on virtual planning as well as treatment and outcome challenges in the afternoon.

The role of imaging in implantology and periimplant treatment will be in focus of two more sessions, before the congress ends with a closing ceremony on Saturday.

Continuing its successful introduction at last year's congress in Rome, Saturday will also see another session presented by an invited society from outside Europe. Guest country this time is the People's Republic of China, a significant future market for implantology treatment (see also page 4). Joined by clinical experts from universities in Beijing and Jilin, this part of the regular congress programme will discuss immediate implant placement and restoration in patients with severe periodontal disease, among other things.

Delegates can still get an overview about the latest clinical methods and techniques during a number of satellite industry symposia and hands-on sessions, which are supported by several major companies in the market. The latest products, including new implants and solutions for improved implant treatment planning, are still on display at an industry exhibition.

It is the first time that the Annual Scientific Congress of the EAO is held in Sweden. Over 4,000 dental professionals from Europe and outside the continent are expected to attend the annual three-day event at Stockholmmässan, which is staged for the 24th time. This year's edition is largely influenced by the work of Prof. Per-Ingvar Brånemark. The Swedish clinician and researcher changed dentistry in the 1960s significantly with his breakthrough discovery of the possibility of integrating bone tissue with an artificial material like titanium, thereby making modern implant therapy possible. Unfortunately, he passed away after a period of illness in December last year. The meeting will honour his achievements with a special symposium on Sunday at the Aula Medica at Karolinska Institutet, where Brånemark was awarded an honorary doctorate.

More information about the meeting, the scientific sessions and the latest products is available on the EAO congress website at www.eao-congress.com. The association also has on offer an application for mobile devices and tablet computers that is aimed at giving visitors quick access to congress-related information. Daily news updates, interviews and product reviews from the show floor are available on www.dental-tribune.com.

“Age per se is not a contra-indication”

An interview with EAO presenter and University of Bern professor Dr Martin Schimmel, Switzerland

During a Friday morning session at EAO 2015 in Stockholm, Prof. Martin Schimmel from the Division of Gerodontology at the University of Bern will be discussing some of the ethical and financial challenges related to implant treatment of the elderly. *today* spoke with him about these issues and the importance of offering this vulnerable population the benefits of implant therapy.

***today international:* Implant manufacturers seem to be exclusively targeting younger age groups nowadays. Do you think the silver generation is being overlooked when it comes to implant therapy and, if so, what could be the reasons for this?**

Prof. Martin Schimmel: I do not think that statement is true. Tooth loss is increasingly associated with elderly people. In my opinion, most manufacturers of dental implants are aware of the fact that people in the Western world are retaining their own teeth for longer owing to the successful implementation of preventive measures.

The treatment of trauma cases in younger people is rather limited. At the same time, the clientele for implant treatment is becoming increasingly older. Data from the Department of Oral Surgery and Stomatology at the University of Bern’s dental clinic clearly demonstrates this. Narrow-diameter implants are also explicitly marketed as “Gero” implants nowadays.

Why do older patients benefit from implant therapy in particular?

Particularly fully edentulous patients and those with an edentulous mandible benefit the most. Stabilising mandibular complete dentures with the help of endosteal implants is one of the greatest achievements in dentistry. Scientific studies have found many positive effects, including improved quality of life, satisfaction with dentures, masticatory functionality and reduced bone atrophy.

Partially edentulous patients can benefit from fixed implant prostheses functionally, as well as structurally. Conventional removable dentures have proven to be inferior, especially in free-end situations.

During a panel discussion at the EAO congress last year in Rome, it was found unanimously that there is no age limit for implant therapy. What is the maximum age at which dental implants could reasonably be used?

Age per se is not a contra-indication. Even in palliative care, implants may still play a valid role. Excluding people from the benefits of this therapy owing to their statistically lower remaining lifespan is unethical. However, one must consider exactly the point at which implants in the mouth do more harm than good—primum non nocere (above all, do no harm)—particularly in situations where cleaning is no longer possible and implants become merely a surface to which biofilms adhere. Furthermore, the possibility of medical contra-indications does increase with old age.

Prof. Dr Martin Schimmel

What factors play a crucial role in the implant treatment of elderly patients, and what factors do clinicians need to consider compared with treatment of other age groups?

Of course, the interindividual variability between patients increases with age, meaning that the older the patient, the more personalised treatment strategies have to be. The planning and implementation need to be constantly adjusted to medical, psychological and social individualities. Minimally invasive surgical approaches and prosthetic treatment methods that take the reduced adaptability and other physiological changes due to age into account have proven successful in this respect.

In Western countries, the gap between rich and poor is ever widening. Elderly people are increasingly falling into the latter group. What measures can help to ensure their access to dental implant treatment?

The only path to broad access to these therapies for financially less well-off patients lies in private or public insurance systems. These are political issues. However, dentists, dental technicians and the industry are constantly working on industrial production structures and thereby reducing costs. Digital developments in dentistry will surely help to provide patients with otherwise expensive treatments for a much more reasonable price. Nevertheless, oversimplified production methods are often not suitable for the complex treatment needs of the elderly.

You have pointed out the benefits of digital production methods. What other measures could also facilitate access to dental implants for the elderly?

Nowadays, the bulk of the costs incurred is due to the hours of work performed by the dental team and technicians. Digital processes can help to shorten treatment times through innovative workflows. Moreover, quasi-industrial production methods can be used in less-complex cases, thus reducing costs further.

It is important to note that implant manufacturers have maintained or even lowered their price levels for quite some time. However, it remains important to evaluate the economic value of using low-cost implants, because they can have a much higher failure rate, as demonstrated by a recent Swedish study (Derks et al. 2015).

From a health policy standpoint, do you see any deficits in the subsidisation of dental implants for the elderly?

This might differ from country to country. In Switzerland, for example, the subsidisation of patients with low income is evaluated individually by local authorities. The treatment of persons who receive social security benefits or needs-based minimum benefits is subsidised if implant therapy can be performed in a simple, economical and appropriate way. Two inter-foraminal implants, for example, will be reimbursed if conventional prosthetic treatment is not able to restore a patient’s chewing ability.

In the statutory health insurance system, there is an obligation to perform the therapy if the loss of teeth was due to the occurrence or treatment of a severe disease, or to an accident or birth defect. There is certainly room for other indications, but one also has to consider the burden for the social security systems. In my opinion, Switzerland has established a sufficient and balanced system.

Thank you very much for the interview. ◂◂

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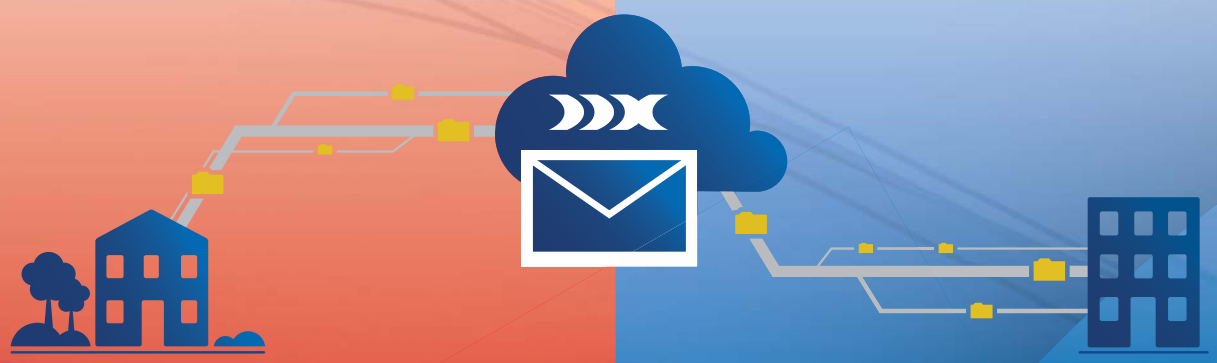

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Growing CAD/CAM abutment adoption *vs* increasingly popular discount implants

Opposing pricing trends to influence Asia Pacific dental implant market

Dr Kamran Zamanian & Celine Mashkoor, Canada

■ The various countries in the Asia Pacific region are all expected to demonstrate an increasing demand for dental implant treatments as a result of growing consumer awareness, the ageing population, growing accessibility (such as through the National Health Insurance Service coverage in South Korea), as well as greater product availability and other influencing factors. Traditionally, premium implant companies have dominated the dental implant market globally. However, in recent years, discounted implants have become increasingly popular, especially in the Asia Pacific region.

The growth of the discount implant segment will emerge at the expense of the premium segment and as a result is set to limit market growth for dental implant fixtures by lowering the market's overall average selling price (ASP). In contrast, the final abutment market is set to experience an increasing ASP owing to the growing adoption of CAD/CAM abutments in the place of stock abutments. While commoditisation of stock abutments has greatly depressed the ASP of the final abutment market, growing adoption of CAD/CAM abutments is set to stimulate the final abutment market by pulling the ASP upwards. Therefore, the dental implant market is set to grow in all four countries included in the Asia Pacific region in this report, namely Australia, South Korea, Japan and China, despite varying pricing trends.

In the Asia Pacific dental implant market, consumer awareness, cultural tendencies and domestic regulations vary greatly. South Korea represents the most highly developed dental implant market as a result of being home to a number of global leading dental implant companies. This in turn has led to a high level of consumer awareness and early accessibility to a variety of dental implant products. However, the dental implant market in South Korea is also highly discount dominant and led by domestic implant producer OSSTEM IMPLANT and as a result demonstrated the lowest regional dental implant ASP of US$ 86 in 2014.

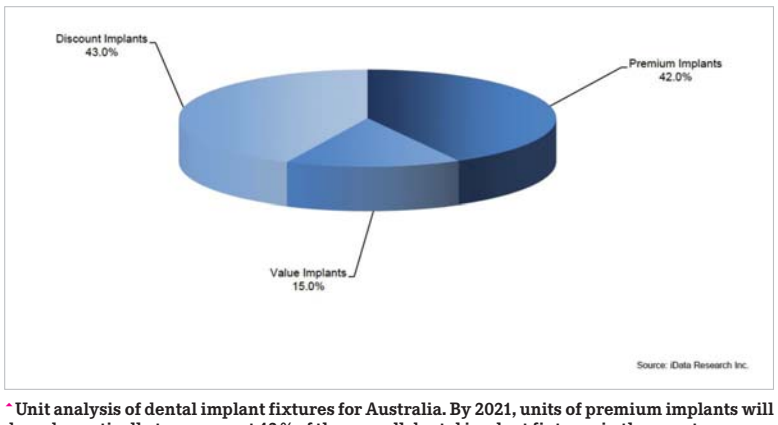
Dr Kamran Zamanian and Celine Mashkoor are market research analysts for iData Research (www.idataresearch.com) in Canada.

In contrast, the Australian market remains highly dominated by leading premium implant companies, which collectively held over 70 % of the domestic market. Consequently, Australia demonstrated the highest dental implant fixture ASP in the region at US$ 345 in 2014. An increasing number of general practitioners are being trained in dental implant procedures in Australia, and general practitioners have been observed to be more cost sensitive relative to specialists. As a result of a growing number of general practitioners in the market, consumer preferences are shifting towards discounted solutions. Discount implant companies from the US and South Korea have recently been gaining market share in Australia. Throughout the forecast period, the premium segment of the market is expected to grow at far lower annual growth rates relative to the discount and value segments in Australia. By 2021, it is expected that discount implants will represent 43 % of the overall units in the Australian market.

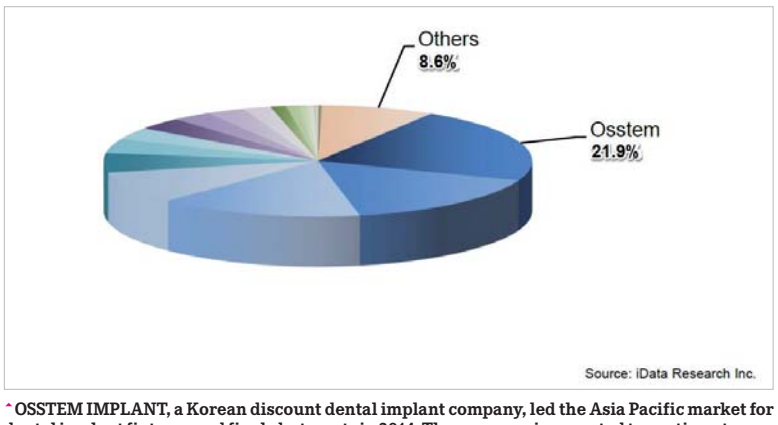
The Japanese and Chinese markets for dental implants are also dominated by premium companies. In recent years, OSSTEM IMPLANT has had a significant impact on the Chinese market, however, especially as a result of the training programme offered by the company's Advanced Dental Implant Research and Education Center. All segments of the dental implant market in China are expected to demonstrate double-digit annual growth. However, the discount market is set to grow far more dramatically throughout the forecast period. By 2021, discount implant fixtures are set to represent over 50 % of the overall units in the Chinese dental implant market.

The shift towards discount implants in Japan is expected to be far less dramatic, especially owing to cultural barriers that limit the success of Korean dental implant companies. The premium implant segment is expected to remain the dominant dental implant market throughout the forecast period. Unit representation of discount implants is expected to increase slightly from 12.5 % currently to 14.6 % by 2021.

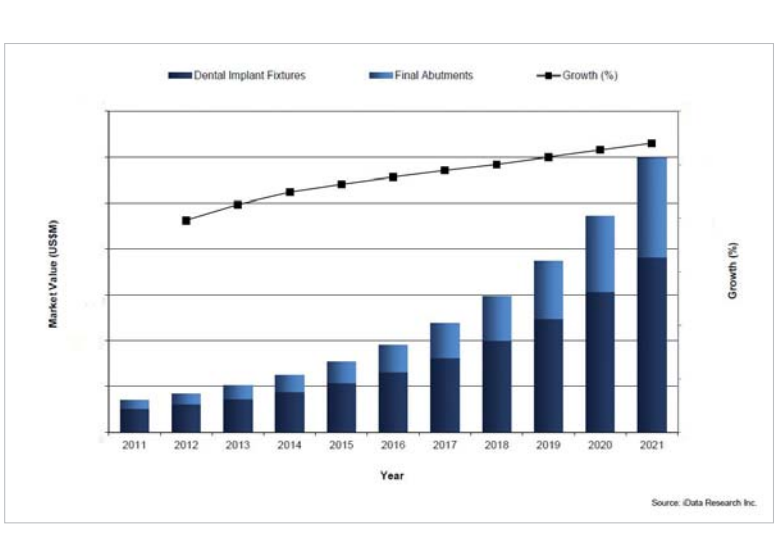
The growing acceptance of discount implants has been driven by Korean companies. The regional market leader, OSSTEM IMPLANT, held a 21.9 % share of the total dental implant market for the Asia Pacific region in 2014. The company has invested significantly in marketing efforts, which has led to the growing popularity of its products. Throughout the forecast period, OSSTEM IMPLANT and other discount implant companies, such as MegaGen, Dentium and Neobiotech, are expected to capitalise on the growing popularity of discount implants. In contrast, premium implant companies, such as Straumann and Nobel Biocare, are expected to face increasing competitive pressures, especially in China and Australia.



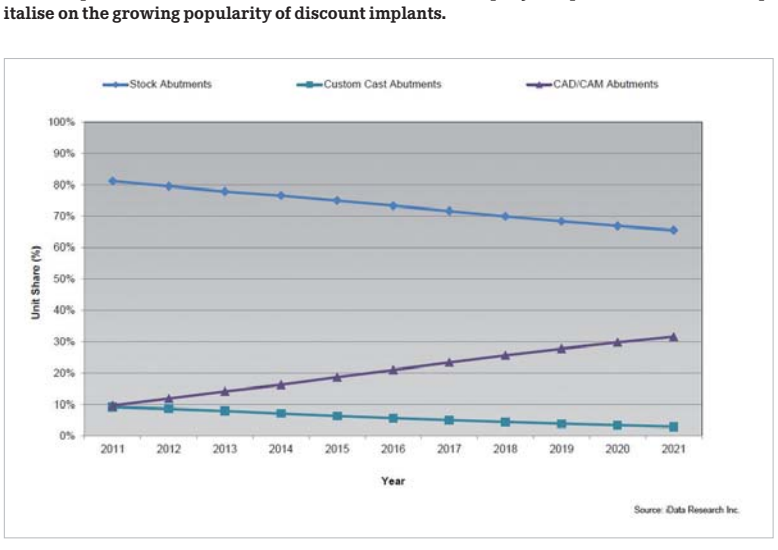
Unit analysis of dental implant fixtures for Australia. By 2021, units of premium implants will drop dramatically to represent 42 % of the overall dental implant fixtures in the country.



OSSTEM IMPLANT, a Korean discount dental implant company, led the Asia Pacific market for dental implant fixtures and final abutments in 2014. The company is expected to continue to capitalise on the growing popularity of discount implants.



China's dental implant market. The adoption of CAD/CAM final abutments, which are more expensive, and a growing discount implant segment are set to result in the final abutment market representing a larger portion of the dental implant market throughout the forecast period.



Growing CAD/CAM abutment market vs declining unit share of stock and custom cast abutments.

Emphasis on CAD/CAM

In the dental implant market, the final abutment market is undergoing an opposing pricing trend relative to dental implant fixtures. CAD/CAM abutments are being increasingly utilised in the place of cheaply produced stock abutments. CAD/CAM development has been relatively rapid in the Asia Pacific region in recent years. A growing number of CAD/CAM milling centres have emerged to produce CAD/CAM abutments for the dental implant market. The overall region is set to demonstrate significant growth in the CAD/CAM segment for final abutments. In contrast to the dental implant fixture market, where discount products are gaining share, the overall final abutment market is set to demonstrate an increasing ASP. CAD/CAM final abutments are relatively more expensive than stock abutments, which have traditionally dominated the market. The shift towards CAD/CAM abutments is set to be most significant in China. For the overall region, units of CAD/CAM abutments are set to grow at a compound annual growth rate of 22.1 %. By 2021, CAD/CAM abutments are forecast to represent 31.6 % of the overall abutment units in Asia Pacific.

Conclusion

Overall, the dental implant market, including fixtures and abutments, is set to grow at a compound annual growth rate of 11.5 % for the Asia Pacific region. The unit growth will far outweigh the ASP effects, and the dental implant market will grow to reach a higher penetration ratio for the overall Asia Pacific region.

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Bisphosphonates: A threat or an option?

By Prof. Per Aspenberg, Sweden

Most dentists will be familiar with bisphosphonates mainly as a cause of osteonecrosis of the jaw (ONJ). ONJ is a complication of systemic treatment. In contrast, locally applied bisphosphonates have been proven efficacious for improving the fixation of dental implants. Theoretical reasoning, experimental data, and small clinical trials suggest that local application of bisphosphonates is safe and effective in periodontology and implant surgery.

Bisphosphonates have positive effects on many conditions in bone and few and rare side-effects. Their efficacy in osteoporosis is well known, and there is evidence for improved implant fixation in an increasing number of applications. In dentistry, however, bisphosphonates are often regarded negatively, owing to the small risk of ONJ.

ONJ is indeed a problem. However, there is theoretical and clinical evidence to suggest that the risk of ONJ can be avoided by local treatment. Local bisphosphonate treatment has shown beneficial effects without complications in randomised blinded clinical trials in periodontology and dental implant surgery.[1] How can this be? Here is an explanation:

Bisphosphonates either bind to bone mineral or are quickly excreted. Normally, they do not enter cells and are therefore not toxic. Only osteoclasts can resorb bone, and when they do so, the dissolved bone material passes through the cell. Therefore, bisphosphonates can reach the intracellular space of osteoclasts. Once inside the osteoclast, they will inactivate the cell and thus reduce bone resorption.

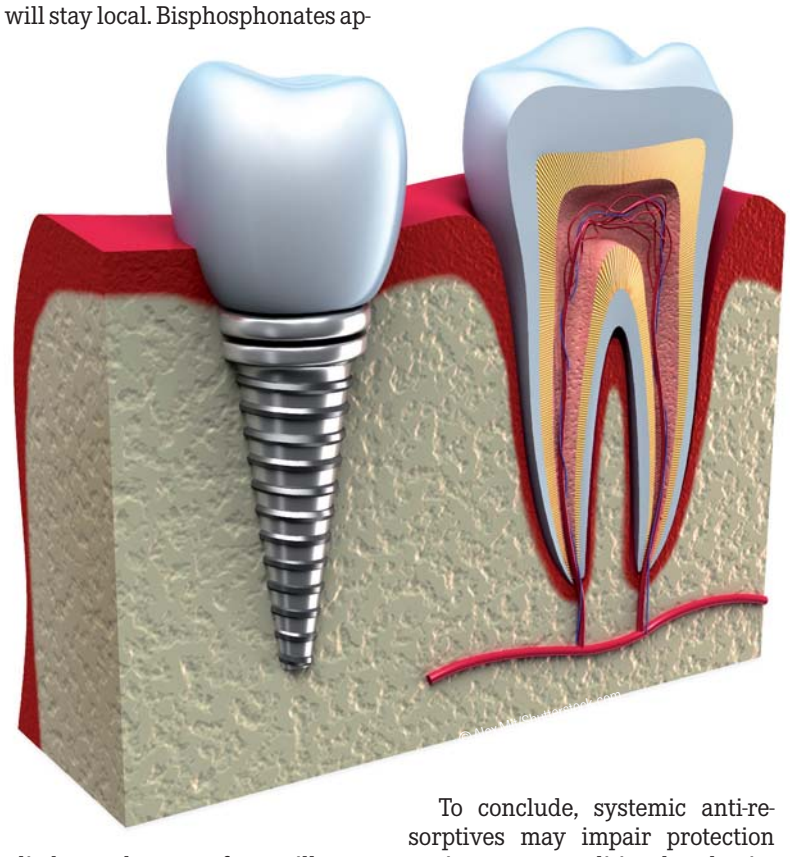
When bone is infected, the bone surrounding the infection will be quickly resorbed. The infected bone will therefore become surrounded by richly vascularised soft tissue that demarcates the infected area. Thus, a good resorption capability is important for preventing the spread of bony infection. This protection mechanism can be impaired if resorption is reduced by any potent anti-resorptive, leading to the spread of infection and established osteomyelitis. In dentistry, this kind of osteomyelitis is called osteonecrosis. Thus, from a pathophysiological perspective, ONJ is a somewhat misleading term. The already well-known anti-osteoclastic effects of bisphosphonates are sufficient to explain ONJ without suppositions about other, less known, mechanisms.[2] Moreover, the theory fits with the observation that non-bisphosphonate anti-resorptives are associated with ONJ too.

Dr Per Aspenberg is Professor of Orthopaedic Surgery at Linköping University in Sweden with two decades of experience in research and clinical trials on the use of bisphosphonates to treat orthopaedic conditions. This morning he will be presenting a paper on bisphosphonates in implant dentistry as part of the congress programme at EAO 2015 in Stockholm.

When implants are inserted into bone, numerous studies have shown that—especially in cancellous bone—bisphosphonates reduce the resorptive response to the trauma without impairing the bone formation response, therefore having a net anabolic effect. This explains why both local and systemic bisphosphonates have been shown to improve the early fixation of knee and hip replacements in randomised blinded clinical trials.[3]

Because bisphosphonates bind strongly to bone, local treatment will stay local. Bisphosphonates applied to a bone surface will stay there more or less forever, and thus not impair the resistance to infection anywhere else. In an animal model of dental implants (at sites compromised by local wounding), the author's group showed that systemic bisphosphonate treatment induced osteomyelitis (ONJ), whereas implants with a bisphosphonate coating improved implant fixation without problems in spite of the compromised insertion site.[4] Moreover, if an implant site in humans were infected, only the bone about one millimetre away from the implant surface would contain bisphosphonate and could be removed if necessary.

In a randomised blinded controlled trial of dental implants coated with a protein layer loaded with bisphosphonates, improved fixation was demonstrated.[5] The resonance frequency was 6.9 ISQ units higher for the coated implants compared with the controls ($p = 0.0001$; Cohen's $d = 1.3$). Radiographs showed less marginal resorption both at two months ($p = 0.012$) and at six months ($p = 0.012$). The patients were followed for five years without complications.



To conclude, systemic anti-resorptives may impair protection against osteomyelitis, thereby increasing the risk of ONJ in patients with other risk factors. Local bisphosphonate treatment could become an important tool in dentistry and maxillofacial surgery.

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

Conflict of interest declaration: The author has shares in AddBIO.

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"Patients tend to go to court more often nowadays"

An interview with Dr Andy Wolff, Israel

Dr Andy Wolff talking to Group Editor Daniel Zimmermann. (© Kristin Hübner/DTI).

■ Be it a careless error or a case of misjudgement, even the most experienced practitioner can make a mistake. In fact, statistics indicate that it is likely that every general dentist will be involved in a malpractice suit at some point in his or her career. Israeli-based dentist Dr Andy Wolff has worked as a medical expert in dental malpractice litigation for many years and has seen almost everything, ranging from slight negligence to severe overtreatment. *today* had the opportunity to speak with him recently about the steady increase in litigation in the field and simple measures that can help prevent many malpractice incidents in the first place.

***today:* Dr Wolff, you have been a medical expert in dental malpractice litigation for many years now. Why is it so important to increase awareness of this topic?**

Dr Andy Wolff: So much literature out there tells dentists how to do things—whether it is placing implants or improving efficacy with the newest technology—but there are no books on how not to do things or, more precisely, what can happen when something has gone wrong. This aspect is no less important, both for the patient affected and for the clinician, who might be facing legal consequences.

Many may think that it is not relevant to them, but every smart physician knows that things occasionally go wrong and no one is immune. By documenting dental malpractice incidents and by talking and writing about these, I aim to raise awareness and therefore help prevent future incidents.

In your experience, what types of malpractice are most common?

There are definitely many cases in the neurological field. As a medical expert, I am confronted with many instances of damaged nerves caused while placing an implant, during tooth extractions or through an injection. It is common and it happens quickly. Typically, it is an inadvertent mistake, because the clinician was either in hurry or impatient. However, the consequences for the patient are mostly very dramatic and often beyond repair.

Aside from nerve damage, is there an area where mistakes are more likely?

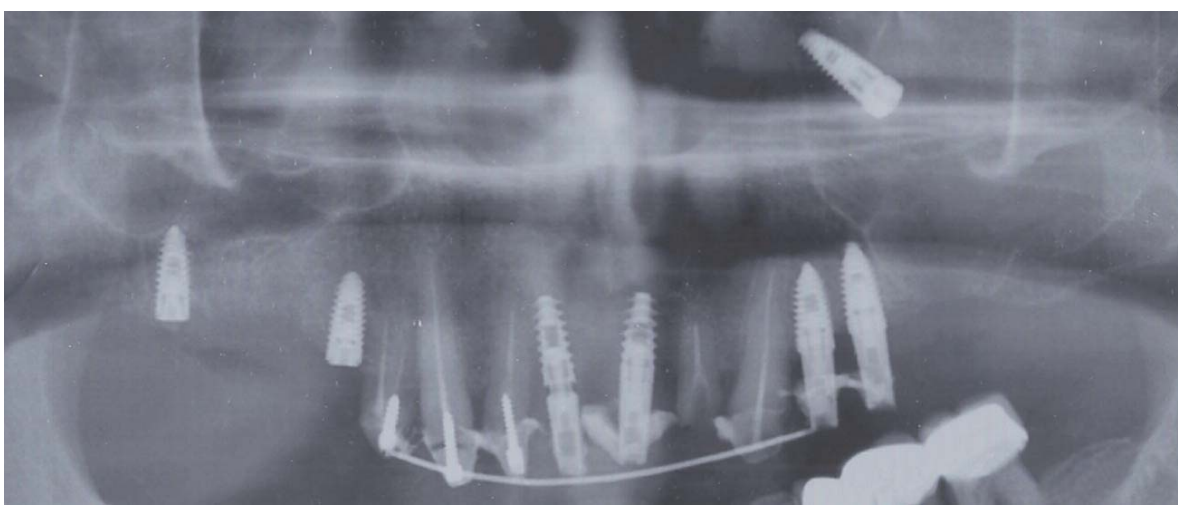
If I had to choose one, I would say it is implants. I recently had a very disconcerting case where an oral surgeon did all the preliminary examination work meticulously, the CT scan, the radiographs, everything. For that reason, he knew for certain that he was working with a bone structure of 11 mm, yet he used an implant that was 13 mm long in the treatment. Maybe he was just mistaken or the assistant handed him the wrong implant and he did not recheck it, but the result was that he hit a nerve.

In this particular case, the dentist was a specialist, an experienced surgeon. Without raising the question of guilt—although the surgeon was without a doubt responsible for the damage—cases like this show that mistakes really can happen to anybody.

So expertise does not preclude mistakes, but there are undoubtedly also cases that result from negligence and hubris.

I certainly see many cases in which dentists have carried out a treatment for which they were not qualified. I remember an incident in which a general practitioner injured nerves on both sides of the mouth during an implant treatment. That is truly unbelievable. I have seen many cases over the years, but nothing quite like that.

In another case, a dentist extracted a third molar without the requisite training. He should have referred the patient to a specialist, but he chose to do it himself—possibly because it earned him another US$ 200–300 (£ 130–190)—with the result that the patient now has to live with chronic pain for the rest of her life.



Displacement of dental implant into the maxillary sinus of a 70-year-old male patient. (© Dr Andy Wolff)

Can injured nerves regain normal function eventually?

Mostly, damage is irreversible. There are exceptions, of course, either if the damage was not too severe or if the nerve was inside a canal. Potentially, an injured nerve can regain function over time. However, if it is an exposed nerve, such as the lingual nerve, the damage is generally irreversible, although there are some microsurgery procedures that may improve the situation. Interventions like this, however, carry extremely high risks themselves and might even aggravate the situation.

It is perhaps comparable to plastic surgery. There are many complaints filed for cases in which the result was not what the patient expected it to be. Compensation payments range from US$ 10,000 to 100,000, which is much lower than those in other medical disciplines.

Do more cases of overtreatment or cases of error on behalf of the dentist end up in court?

These cases have an almost equal occurrence. Of course, overtreatment leaves the dentist in a bad position. It raises the question of why he or she treated the patient unnecessarily in the first place and did so poorly in the second; it leaves him or her doubly guilty. If a mistake occurred after a reasonable treatment plan had been formulated, it is comparatively less bad. Sometimes, even if a patient dies while undergoing therapy, this does not need to involve a distinct fault of the clinician.

An American dentist was recently charged because his patient died after he extracted 20 teeth in one procedure.

I have performed such extensive treatment in the past; it depends on the need for the treatment and how it is done. Probably, that case in the US was the result of a combination of many things. For instance, did the dentist act in accordance with state-of-the-art practice? If not, he is at fault. If he did, one has to remember that dentists cannot rise above today's level of knowledge and technology. Let us say an impaired patient files charges for something that happened to him 20 years ago that would have been preventable with the latest medical treatment. He can, of course, make a claim, but the dentist could not be sued for it if he or she treated the patient according to the best knowledge available at that time.

That is a very important aspect when writing expert reports on dental malpractice: did the dentist act to the best of his or her ability and according to the current knowledge or with gross negligence? That is what makes the difference.

What can medical professionals do to protect themselves against legal disputes arising from high-risk procedures they intend to perform?

Patients should not only be warned of the possible consequences of a certain procedure, but also be advised of the alternatives—and one of those alternatives is not proceeding with treatment at all. In my opinion, the patient should always understand both options: the risks of a particular treatment and what could happen if nothing is done. Only then should the patient be asked to sign a declaration of consent.

Unfortunately, the reality is often quite different. Patients are often asked to sign declarations of consent on their way into surgery or while already on the dental chair. Even if they had questions then, there would be no time to answer them properly. Although it should be of major concern for every dentist to thoroughly inform the patient of the risks, as well as alternative treatment methods, before he or she is asked to sign a consent form, I am constantly confronted with the opposite.

So, you are saying that consultation should be of similar importance to treatment?

Absolutely. In my opinion, building mutual trust between doctor and patient is key for avoiding malpractice and consequential charges. If patients feel that their condition is being properly treated, and that money is not the dentist's first concern, this alone can prevent litigation in many cases. Of

course, if a nerve is damaged, there needs to be a settlement of some kind, but if a bridge fails, for example, instead of filing charges the patient will return for further treatment if there is a solid, trust-based relationship.

Time, communication, trust—what else is important when it comes to preventing malpractice?

One more basic rule every dentist should follow is adhering to evidence-based dentistry. This means not performing a certain treatment just because in the dentist's experience it is considered to be right. External scientific evidence should be implemented. Also, every single finding should be taken into account in determining how to treat the individual patient: diagnosis, radiographs, periodontal analyses, age, health status, literature and so on. Neglecting these related aspects can very likely lead to misconduct.

Do you see basic problems in dentistry that need to change?

Nowadays, we face the problem of "cheap" dentistry. Owing to the amount of competition with the large number of dentists in the market, there are many cases of overtreatment. Cheap dentistry needs to be fast, yet I have documented cases in which patients have returned for retreatment of a simple problem up to 70 times in two years. If you add up the time those patients invest only to have a poor outcome, it is striking. However, it is not possible for there to be elite dental practices solely. For legal purposes, dental treatment does not need to be exquisite, but it has to be reasonable.

Maybe it is a problem of today that patients have increasing expectations regarding the service or technologies their dentist should be using.

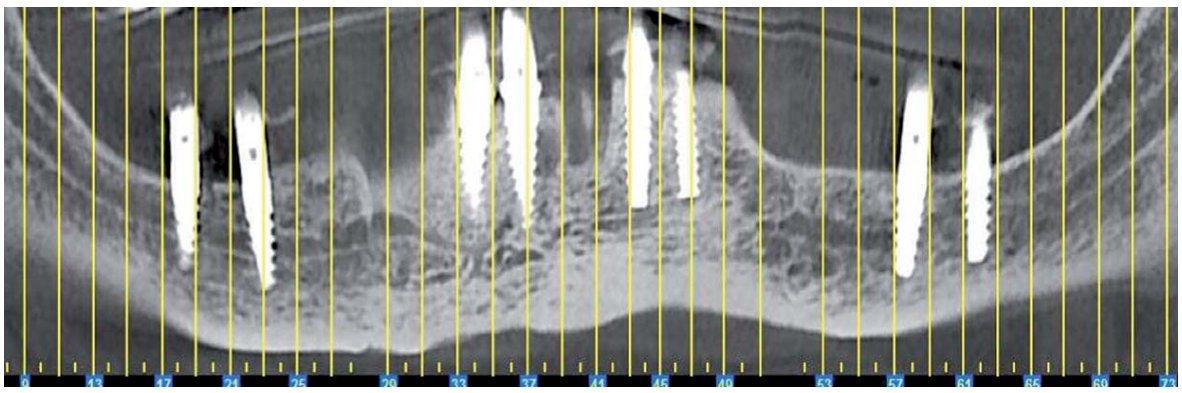
That is certainly part of the same problem. Advertising that promises people a new Hollywood smile in 2 hours forms the basis of patients' beliefs or expectations regarding treatment. Dentists should not be tempted to involve themselves in this kind of misguided pressure. Honest communication is key when aiming to avoid disappointing patients.

Measures to prevent malpractice should begin as early as possible, but where should prevention start?

Personally, I think legal regulation should be extended, such as specific laws or by-laws concerning the amount of experience and training, for example, required in order to perform certain procedures. Basically, it is just what common sense calls for and everybody will agree with if they think about it: should one be allowed to place an implant after attending a speakers' corner talk or looking over a colleague's shoulder? No, yet this is often what happens.

A second measure could focus on undergraduate education. Dental schools should devote more time to prevention of lawsuits. This aspect is neglected in the curriculum, although it is an essential part of dentistry. General awareness of the subject needs to be raised and this alone would help prevent mistakes. As I said earlier, mistakes are not always avoidable, but they should at least not arise out of negligence, hubris or greed. Apart from that, there will always be cases of medical malpractice. Dentists are humans too; only he who does nothing makes no mistakes at all.

Thank you very much for the interview.



Bilateral mental and labial paraesthesia in a 62-year-old female patient due to bilateral mandibular canal perforation. (© Dr Andy Wolff)