INVESTIGATION

COMBATING PERI-IMPLANT DISEASE

Caroline Holland looks at a new approach to combating the alarming prevalence in peri-implant disease among patients with dental implants.

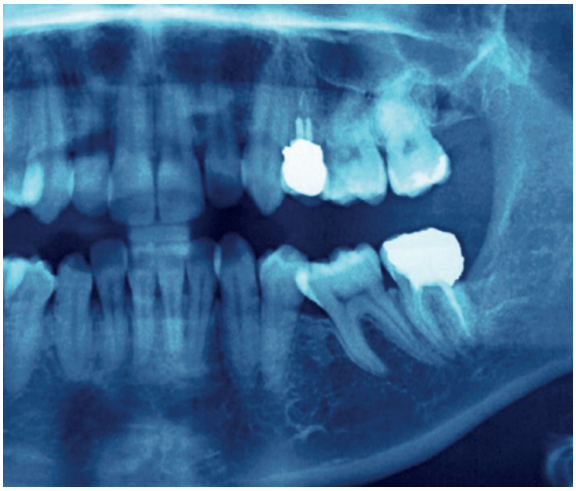
A picturesque hamlet in a mountainous region of Spain was the unlikely setting last year for a turning point in the history of dental implants. The occasion was the 11th European Workshop on Periodontal diseases (EWP), a gathering of top periodontists from Europe and the USA, who divided up into groups to debate key issues and produce international guidelines for practitioners and patients.

The brief for Working Group 3 was: *Primary prevention of peri-implantitis and managing peri-implant mucositis*. Following analysis of the key systematic review papers prepared in advance of the workshop, the clinicians in that group identified that there is 'an alarming and increasing prevalence in peri-implant diseases'.[1]

One of the consensus statements to emerge from the EWP overall indicates that 46% of patients with implants have peri-implant mucositis and of that figure, 22% have peri-implantitis. As a result, peri-implantitis has been quantified as 'an emerging public health issue'.

As a condition, peri-implantitis is far from new but in 2014 a re-evaluation was underway. For the profession, emerging research indicated that periodontitis and peri-implantitis are not synonymous. For the public, peri-implantitis became a source of concern, having been raised in the House of Lords,[2] by Baroness Gardner of Parkes (a dentist), as well as in the media.[3]

Since then, the Dental Defence Union[4] has published results which show a 41% increase in the five years up to 2013 in claims relating to dental implants. Meanwhile, in August this year, there was further confirmation of the rising cost of implant-related clinical negligence claims. Dental Protection Ltd, which represents the majority of UK dentists, came into line with the other UK defence organisations by announcing that dentist members who place or restore implants would pay a higher subscription.[5] In the notice announcing its increased subscription, Dental Protection warned: 'It's likely that the GDC will be looking for ways to regulate implant dentistry more proactively and rigorously.'



©gece33/iStock/Thinkstock

More recently, it has emerged that peri-implantitis isn't simply a matter of disease progression. For decades, titanium (Ti) had been regarded as failsafe due to its bio-compatibility and apparent resistance to corrosion. But the number of failures resulting from inflammation and bone loss was growing. Perhaps Ti was not as biologically passive as previously thought? The University of Birmingham was one of the first centres to investigate whether, in certain circumstances, Ti itself could contribute to poor implant outcomes.

Leading the project was Professor Owen Addison, Chair in Applied Biomaterials and honorary consultant in restorative dentistry in the School of Dentistry. His research has focused on biophysical aspects of implant failure – the interface of biology and materials. The first challenge was to demonstrate if Ti derivatives were being released from the implants and the second was to assess whether these were influencing how patients responded biologically to the presence of the titanium in their mouths.

His first breakthrough in 2012 was the result of a study of titanium bone-anchored hearing aids among patients going into hospital for scheduled revision surgery. His team found microscopic particles of Ti, manifest as different chemical species in inflamed tissues. With an evident propensity to be pro-inflammatory, the findings cast doubt for the first time on the robustness of Ti and its resistance to corrosion.

In a press release which was picked up globally, Professor Addison commented at the time: 'Ti remains the gold standard but may not be as robust as previously thought.' He is now coming to the end of a five year programme of work funded by the National Institute for Health Research on 'Modification of the inflammatory response in peri-implant sites by titanium ions and debris.'

While the derivatives have an effect, they don't seem to demonstrate cyto-toxicity in a classical way, he says. 'What we are seeing is that they can be well tolerated but the key thing is that they have the capacity to bio-accumulate and in certain cases to modify cellular behaviour in the tissues around the implant site.'

He added: 'Where Ti is released, the reaction to pathogenic bacteria in the implant surface biofilm may be modified, possibly increasing susceptibility to disease progression.' Nevertheless, he says, dental implants have been remarkably successful and will continue to be an important option for patients. He is confident that solutions can be found which will help reduce the prevalence of peri-implantitis.

What does the future hold? The value of the UK market alone in 2015 was nearly £46 million and this is predicted to increase by roughly 8% per year reaching nearly £100 million by 2023.[6] Despite these confident predictions, it seems likely that the enhanced subscriptions of indemnity organisations will have an impact and only those clinicians most committed to implant provision will continue as providers.

Could this mean that implant provision becomes the preserve of the specialist? Philip Friel, the current President of the Association of Dental Implantology (ADI), hopes not. He stressed that the vast majority of implants are placed by general dentists and indeed the ADI was established by a general dentist, Barry Edwards, as an organisation for like-minded colleagues.

'We organised a focus meeting four years ago on the subject of peri-implantitis and this was and still is the best attended ADI meeting ever. ADI

has been involved for many years in peri-implantitis education and we want to raise awareness that this can occur, will occur and is occurring. As a community, we are working out how best to deal with it. There has to be a difference between survival and success.

'We have to incorporate contingency into the treatment plan so that if there is a failure, we will be able to deal with it – for instance, the fixed implant solution which can be turned into a removable solution as the patient's age and dexterity declines.'

Anthony (Ben) Bendkowski, owner of the Implant Experts in Maidstone, says dentists are adept at identifying solutions. For instance, he has been platform switching for many years. Now an implant has been devised which incorporates platform switching into the design. In his view, marketing is part of the problem and he believes there can be too much emphasis on immediate implants. 'I tell patients that I can replace missing teeth, I can place implants and I can regenerate missing bone. That's three miracles and it might be one too many in a day.' Should there be more training? Dr Bendkowski said: 'There is a lot of good education out there. There are accessible diplomas and most of the implant companies are responsible and have networks of mentors.'

The emphasis should be on staying up-to-date on the technologies and techniques that can minimise the risk of peri-implantitis, whether it's platform-switching, careful debridement of cement, or surface technology. Implants may look similar but micro-engineering has improved substantially. Once they have undergone appropriate training, dentists need to be adept at careful case-selection, education of patients that implant maintenance is for life and ensuring regular appointments with the practice hygienist.

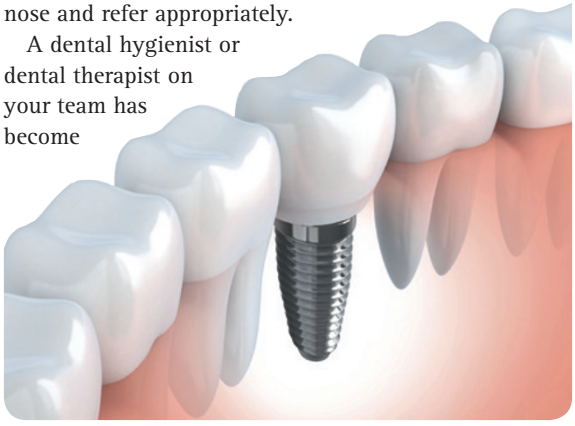
Dental Protection advises on the importance of discussing the potential risks of peri-implantitis with the patient as part of the process of obtaining valid consent. The dental team also has an obligation to be aware of the condition and to review their patients' implants from this perspective, even if they did not place the implant themselves.

If Dr Eddie Scher had his way, the word implantologist would be banned from the dental lexicon because, he says, it's misleading; all dentists should be educated and trained in the delivery and maintenance of dental implants. He has been providing dental implants and teaching colleagues for around 25 years from the Walpole Street Practice.

'Each and every single dentist should know how to treatment plan an implant case. If a tooth can't be saved, a dental implant has to be an option. Even if you choose not to carry out the surgery, you need to understand the treatment modality. You may refer the patient out of the practice, but you remain the captain of that patient's team and you will be seeing that implant each and every time they return for an appointment.'

And what of the new patient in the practice who has an implant placed by a retired dentist or who has gone abroad for treatment? Whether they like it or not, the treating dentist assumes a responsibility for keeping it healthy. As a minimum, they need to be able to diagnose and refer appropriately.

A dental hygienist or dental therapist on your team has become essential. In a recently issued press release,[7] Michaela ONeill, President of the British Society of Dental Hygiene and Therapy (BSDHT), spoke about the role dental hygienists and therapists can play in helping to prevent peri-implant diseases, referencing the consensus statements of the EWP.



©Vladru/iStock/Thinkstock

The EWP identified that after five years only one in five (18%) of patients (with implants) who complied with supportive therapy presented with peri-implant diseases, while the proportion of patients with problems who did not adhere to correct supportive therapy was more than double (43.9%). She said: 'What is easily evident is that with correct supportive therapy offered by dental hygienists and therapists, the majority of these cases can be prevented.'

The work of the EWP[8] will no doubt reverberate for years to come, influencing training and practice in implant provision as well as prevention of disease. Professor Iain Chapple, a co-chairman of the workshops and current President of the British Society of Periodontology, believes that however challenging it may be, the profession must be able to achieve behaviour change in patients. This is the way forward.

'We are surgeons and we like to get stuck in; we need to get stuck in because professionally administered prevention alone is insufficient, but equally, physical debridement without the preventive advice is also ineffective.

'A change in philosophy from a surgical mentality to a medical one is long overdue; it's time for individualised oral healthcare. That also means assessing patients prior to implant placement for the three key risk factors for peri-implantitis: a history of previous periodontitis, smoking and poor oral hygiene. We must provide appropriate advice and counselling about the potential complications of implant therapy, otherwise we don't have informed consent and we are not placing our patients' best interests at the centre of our treatment planning.'

1. European Federation of Periodontology. News update (2015). Available online at www.efp.org/newsupdate/2015/perio-dontology-prevention-peri-implantit (accessed January 2016).
2. House of Lords Daily Hansard. HL Deb (2014) Col 494. Available online at www.publications.parliament.uk/pa/ld201415/ldhansrd/text/140723-gc0002.htm (accessed January 2016).
3. The Telegraph. Peri-implantitis: The 'time bomb' in dental implants (2014). Available online at www.telegraph.co.uk/news/features/10964601/Peri-implantitis-The-time-bomb-in-dental-implants.html (accessed January 2016).
4. Dental Defence Union press release. Claims for dental implants rise by 41 per cent (2015). Available online at www.theddu.com/press-centre/press-releases/claims-for-dental-implants-rise-by-41-per-cent (accessed January 2016).
5. Dental Protection. Implant Dentistry Rates. Available online at www.dental-protection.org/uk/join/implant-rates (accessed January 2016).
6. Decision Resource Group (formerly Millennium Research Group). Dental Implants Europe 2015: Market Analysis. Available online at //decisionresources-group.com/report/?id=3760 (accessed January 2016).
7. British Society of Dental Hygiene and Therapy news release: Risk of peri-implantitis more than doubled without correct supportive therapy (2015). Available online at www.bsdht.org.uk/Risk_of_peri-implantitis_more_than_doubled_without_correct_supportive_therapy.html (accessed January 2016).
8. Tonetti M S, Chapple I L, Jepsen S and Sanz M. Primary and secondary prevention of periodontal and peri-implant diseases: Introduction to, and objectives of the 11th European Workshop on Periodontology consensus conference. *J Clin Periodontol* 2015; **42:** 1-4.