The current state of periodontology in the UK and why there needs a lot to be done. By Prof. Francis Hughes, London

The UK is gearing up to host the largest conference in Periodontology and Implant Dentistry ever held with EuroPerio taking place on 3–6 June at London ExCel. Over 100 speakers will contribute to the main scientific programme and there are many additional sponsor sessions. Over 1,500 abstracts have been accepted. Already over 7,000 periododontists, implantologists, general dentists and dental hygienists from 96 different countries have confirmed their attendance. We expect to have nearly 10,000 people at the conference in total, a new record for a conference in this field, and it is till not too late to register.

Given the huge popularity of this event, it is perhaps a perfect time to reflect on the state of periodontology in the UK. It is clear that periodontal disease is not going to go away any time soon. Although there is a lack of detailed epidemiology of the disease in the UK, the Adult Dental Health Survey provides a useful indicator of trends in the epidemiology of the disease, even if it probably seriously underestimates true prevalence rates, owing to the limited methodology used in this survey.

The good news is that there has been significant reductions in the number of people with visible plaque and calculus present, (but this is still reported as 45% of the population) and concomitant reductions in the amount of mild periodontal disease, consisting of gingivitis and those with low levels of attachment loss. However, perhaps unexpectedly, this has not been associated with similar reductions in moderate and severe periodontitis. In fact, the number of adults with severe periodontitis (pocketing of 6 mm+) has increased from 6% in 1998 to 9% in 2009. The reasons for this may be complex but are likely to include the fact that we have an increasingly aging population, and that dentists are (highly) taking out fewer teeth even when judged to have poor long term prognoses.

This disconnection between trends in plaque control to more severe destructive periodontitis is a common finding in a number of recent epidemiological surveys in different populations and underlines the complexity of aetiological factors which determine susceptibility to destructive periodontitis. Although plaque tends to correlate directly with gingival disease, in the majority of people this may not necessarily result in the progression to more severe periodontitis. The major risk factors which are implicated in this process including smoking, genetic factors, and medical factors, particularly diabetes and medications such as calcium channel blocker antihypertensive drugs.

The impact of the well documented rise in the numbers of older people may be particularly important for future treatment needs. The over 65 year olds are often fit and well and have high expectations for their continued health needs, even though they may also suffer from common medical conditions such as type 2 diabetes and hypertension and may take multiple medications.

Impact of periodontal disease

Periodontal disease has typically been seen as a “silent disease” which might have few consequences unless resulting in tooth loss. However, there is now lots of evidence to refute this concept. Patients with periodontitis consistently report significant impacts of the condition on their quality of life, particularly impacting on function, aesthetics, comfort and self esteem. Furthermore, even mild disease resulting in gingival bleeding and perhaps halitosis impact on social acceptability and remain highly legitimate reasons for treatment need. Prevention of more severe disease is of course best achieved by primary prevention and early disease control by achievement of high levels of plaque control together with management of modifiable risk factors, particularly smoking cessation.

Periodontal disease has now been associated with risk of a number of other systemic conditions, most notably cardiovascular and cerebrovascular disease, among many other conditions. It has been clearly shown that periodontal disease causes a measurable systemic inflammatory response but it is not at all clear that periodontal treatment alters the risk of these conditions, or whether the conditions are associated through common factors such as genetic predisposition. Nevertheless, given the importance of these systemic conditions it is recommended that periodontal health should be regarded as part of general health.

Manpower

Clearly there remains a major, often unmet, periodontal treatment need within the UK population, which represents a significant challenge for dental health professionals. There are currently over 30,000 registered dentists and over 6,000 dental hygienists in the country. In addition, there are approximately 300 periodontists on the specialist list, who work mainly in private specialist practices or in the hospital and university services. Given that there are an estimated five million cases of moderate to severe periodontitis, and perhaps 20 to 30 million with some signs of periodontal disease, it would appear that these relative proportions of dental manpower are not currently ideally suited for the provision of primary and secondary periodontal care according to actual clinical needs. There are of course a significant but unknown number of general dentists who provide a degree of periodontal treatments that might otherwise be considered to be secondary care level.

The number of specialist periodontists in training is small (certainly less than 20 every year), which is probably insufficient to maintain the total number on the specialist list over time. There is considerable interest and some commitment to providing a group of dentists with additional skills in specific restorative specialties in including periododontists, who could potentially meet much of the treatment need for secondary care periodontal treatment, but this group does not really exist at the present time. It should also be commented that this model of periodontal care provision does remain essentially untested on a large scale at present.

Overall the picture of periodontal care provision in the UK at present is mixed at best. In most areas of the country, those choosing to seek their periodontal care from the private sector, are able to access specialist care from highly trained periodontists and their teams, who often provide a wide range of effective and sophisticated treatment options. However, outside the dental schools there is little or very patchy access to specialist treatment services within the NHS. Recognition of this manpower deficit and a move to address it through intermediate level training in periodontal therapy is an encouraging but still unproven development.

Possibly the most important health professional for the implementation of primary prevention are dental hygienists. Although there is little evidence on deployment of hygienists within primary care, anecdote suggests that they may spend much of their time removing supragingival calculus (as prescribed by their employing dentists) without any routine attention to properly targeted attempts to provide adequate personalized oral hygiene instruction. Indeed the whole issue of the routine “scale and pol-
ish” as a therapeutic intervention has been questioned and is the subject of current research projects whose findings are yet to be reported.

**Implantology**

Many aspects of implantology, including surgical management, management of soft and hard tissues, and management of peri-implant health and disease, are squarely within the realm of periodontal treatments, and implantology is indeed a substantial component of specialist training in periodontology. Whilst the growth in implant treatments has been markedly slower than in many other European countries, there is now a large and ever-growing use of dental implants in UK dental practice and a wider acceptance from significant numbers of patients of the value of implants and their potential cost/benefits. It is quite clear that the potential for implant treatment could never be met within the National Health Services as the costs could potentially swallow much of the total NHS budget. However, some recognition of the clinical needs and cost/benefits on a more individual basis even within the NHS dental services would appear to be inevitable in the future.

There are two major developing issues, which are partly related to each other, which may particularly affect the periodontist practicing implant dentistry. Firstly, there is the growing problem of peri-implantitis. Reported prevalence rates of long-standing implants do vary but are typically on the region of 30%. This progressive destructive condition creates particular problems as it appears to be much more difficult to manage than its first cousin, periodontitis. As many more implants have been placed for a number of years there is great concern about the growth of this condition.

Secondly, apparently oblivious to the above problems and an understanding of long term survival rates of teeth and implants, there is a disturbing trend amongst some to advocate early removal of diseased teeth and replacement by implants. There may be some short-term gains for the dentist and/or patient to be had from this approach but it is a sure way to store up major new problems for the future.

So there remains a lot to do to tackle periodontal disease in the UK. One of the most encouraging developments in the near future is the development of care pathways within the General Dental Services which place considerable emphasis on prevention, risk factor management, and tackling early periodontal disease, as well as mapping out appropriate care pathways for those in need of more involved periodontal treatment. This will inevitably be painful for some as it represents a new way of service delivery based on evidence-based outcomes. However, it also carries with it the prospects for better provision of higher level periodontal care, particularly if the planned development of dentists with some specialist skills is successful.

**Challenges remain**

The challenge of managing periodontal disease in an increasingly aging population are likely to become a major issue going forward, and at time the profession will have to consider how it interacts with general medical services, for example in screening and detection of the currently estimated 750,000 people in the UK who may have undiagnosed diabetes.

The private sector looks set to increase its provision of specialist periodontal care and implant provision. The challenges of long-term implant survival and management of peri-implant disease will present new challenges for many. There will undoubtedly be novel treatments and developments which we can only speculate on. Interesting times indeed but there is lots to do.
Where periodontology has advanced

A critique of current trends in the field. By Europerio8 presenter Prof. Mark Bartold, Australia.

Over the past 30 years there have been some exceptional advances made in periodontology. Many of these have led to changes in our thinking and our approach to periodontal therapy. In 1999, the American Academy of Periodontology (AAP) devised a “new” classification system for the periodontal diseases. From this some 50 different types of periodontal conditions were identified which were considered worthy of individual classification. Clearly this was an unwieldy system and in reality it was distilled down to three main types of plaque-associated periodontal disease: gingivitis, chronic periodontitis and aggressive periodontitis.

While the appropriateness of the terms “chronic” and “aggressive” have been debated they have served as a framework for both clinicians and researchers to define specific types of periodontitis with identifiable clinical parameters. It also provided a framework for understanding management protocols and outcomes. Nonetheless, over time it has become evident that such a classification system (chronic and aggressive) may be too simplistic because of the heterogeneity of the periodontal diseases. Therefore, it may be timely to revisit such a classification system and determine whether current understanding of the epidemiology and pathology of these diseases can be used to better define them.

However, it is worth noting that in the past 25 years there have been at least 10 different classification systems proposed, none of which have been fully adopted. Clearly there remain a number of important challenges in this field. Since chronic and aggressive periodontitis are heterogeneous groups of diseases, for example, there will be unique subcategories based on their multifactorial nature basis of microbial, host response and environmental components. At present, apart from “plaque-associated” designation, the current AAP classification is not based on cause-related criteria.

Recognition that bacteria are necessary but not sufficient for periodontitis to develop.

During the 1990s a very important conceptual advance occurred in our understanding of dental plaque and its interaction within the subgingival environment. The recognition that subgingival plaque existed as a biofilm with its own microregulatory and communicative properties changed our thinking of how the subgingival microorganisms interacted not only with itself but also the host. Notwithstanding this, research through the 1990s and 2000’s began to question the role of the host alone in determining the bacterial consortia in the overall process of the development of periodontitis. It became evident that periodontitis cannot be interpreted in isolation and is not separable from the host response. It was also recognised that there were some patients who, despite the presence of considerable plaque deposits, did not develop periodontitis. On the converse it was also evident that there were individuals who had very minor visible deposits of plaque yet developed very advanced and destructive periodontitis.

These observations led to a major paradigm shift in periodontology in which it was agreed that although plaque was necessary for periodontitis to develop, it was not sufficient for it to develop. Indeed general wellness was recognised by the US Bureau General in a landmark publication titled “Oral Health in America”. This document for the very first time articulated the importance of oral health in an holistic approach to medical care. Despite the title, its content was relevant to the whole global scene. From this the concept of periodontal defects as an “inflammation based” condition and its central hypothesis stated that periodontal infection and inflammation presents a significant chronic inflammatory burden at the systemic level.

While there is considerable work still to be done significant progress has been achieved in the past decade. Diabetes is now well recognised to be a significant risk factor for development of periodontitis and conversely periodontitis is considered to be a significant modifying or risk factor for glycemic control in diabetes. Other conditions for which there is good evidence to support interrelationships with periodontitis include cardiovascular disease, rheumatoid arthritis, obesity and renal disease.

Unfortunately, this has become an opportunistic field of research and to date some 58 conditions have been claimed to fall within the periodontal disease/systemic disease axis, most of which have little or no biological or clinical plausibility.

Understanding that periodontal regeneration is biologically possible

Regeneration of damaged periodontal tissues as a result of periodontitis has been considered the ultimate goal of periodontal treatment. Over the decades many procedures have been advocated, mostly associated with root surface conditioning and implantation of bone substitutes into periodontal defects as a means of obtaining periodontal regeneration.

Unfortunately, these early concepts were naive owing to a lack of understanding of the requirement for periodontal regenera-

tion, namely the encouragement of new cementum and new periodontal ligament. Filling a periodontal defect with a substance that had no relevance to the next functional stage of regeneration is irrational. Nonetheless, as a profession, we had become obsessed with filling holes in bone rather than studying the natural healing processes required to regenerate the periodontal attachment apparatus. Ignorance of the contribution of the various tissue components in periodontal wound healing explained the widespread misuse of bone transplantation in the treatment of intrabony pockets which unfortunately still pervades some areas of periodontology.

It is now recognised that regenerative treatment of periodontal defects with an agent or procedure, requires that each functional stage of reconstruction be grounded in a biologically directed process. With such concepts in mind, the seminal studies of Karring, Nyman and coworkers from Gothenburg in Sweden led to the development of guided tissue regeneration (GTR) approach to periodontal surgery. This was a significant advance because it became evident that while periodontal regeneration was biologically possible, it was clinically very difficult to achieve on a reliable basis owing to a vast range of patient and operator variables.

More recently we have seen the development of biological agents and preparations which, when applied onto root surfaces, can result in significant regeneration of damaged periodontal tissues. The use of such agents offers a simpler approach to periodontal regenera-

tion with equivalent, and sometimes superior, results compared to GTR procedures. However, as has been noted for GTR, the clinical outcomes using biological agents can be variable and further work is needed to improve their clinical utility. Moreover, the use of mesenchymal stem cells and genetic modulation of periodontal cells have been explored for the purposes of achieving periodontal regeneration. The future looks promising but no doubt there is a considerable amount of work to be done before reliable and predictable periodontal regeneration becomes a reality.
PTFE surgical sutures: Is it worth to use them in oral surgery?

By Dr Barbara Ziolecka, Poland

Effective wound healing is a key factor determining the success of a surgical process. Any disturbances to that process may lead to inflammatory reactions hindering tissue regeneration, as well as numerous complications, such as extensive scarring that creates functional and aesthetic problems. Treating the complications is difficult and contributes to discomfort of a patient.

Minimising the risk of complications is crucial particularly in precise periodontological procedures, as well as in bone augmentations. Proper suturing techniques and a careful selection of suture material have a direct impact upon correct tissue fixing. Absorbable sutures, particularly braided ones, should not be used for external tissue fixing in the oral cavity. The reason for this is a significant risk of bacterial plaque adhesion, a quick loss of sustainability of the suture resulting from harmful effects of digestive enzymes, and increased susceptibility to microbes penetrating the wound together with blood, saliva, and nutritional fluids.

So far, it has been recommended that external fixing of oral cavity tissues be carried out using the use of non-absorbable, monofilament materials, most often made from nylon, polypropylene and polyvinylidene fluoride (PVDF). Their scabrous surface does not permeate liquids and does not yield to enzymatic processes, while bacterial plaque aggregation is minimal. Unfortunately, traditional non-absorbable suturing materials are not void of faults. The fibers are not flexible enough and will not adapt to the varying volume of the healing tissue. Significant rigidity of polymers that are the core of their structure is a characteristic ill-talent by the patients. It causes irritation of the mucous membrane and often leads to painful erosions, as well as viral-caused lesions. From the clinical point of view, involuntary contact between the tongue and the irritable spot is unfavorable to the healing process, as well as to the integration of ingrafted material or transplanted tissues.

Currently, it seems that the best suturing material for dressing the wounds within the oral cavity is polytetrafluoroethylene (PTFE). It is a suture having the characteristics of a filament, yet at the same time maintaining unprecedented fiber flexibility. PTFE sutures were introduced many years ago for demanding cardiosurgical procedures, due to their high biocompatibility and unique physical qualities.

The various available types of PTFE sutures differ mainly in the structure of fiber. For dental procedures, during which the sutures have only temporary contact with the tissues, the most appropriate suturing material is one based on a smooth, high density called dPTFE. It is characterized by a degree of flexibility, which is a great asset in tissue fixing, irrespective of the changing volume that accompanies a given healing stage. High bio-compatibility of dPTFE sutures, the softness of fiber, a restricted adhesion of bacterial plaque, and minimized microbial penetration into the wound provide for the highest level of safety.

The analysis of clinical usefulness of sutures 45 cm in length has indicated that most complex dental procedures require two pack ages of the suturing material. Longer sutures (approx. 75 cm) are less comfortable to use: suturing with the use of an instrument is more difficult, while the risk of suture infection in a restricted operating area is increased. Therefore, it seems that the most appropriate length of sutures for oral cavity dental procedures is approx. 55 cm.

The suturing material that meets all criteria discussed above is COREFLOW (Booth 53e). It is available in sizes ranging from 3-0 to 6-0 and comes together with high-quality needles with modern geometry. A perfect alignment of the needle’s diameter and the diameter of the Teflon fiber results in a significantly smaller post-operative bleeding. PTFE sutures are more expensive than other available suturing materials, but considering their unique characteristics of reducing complications after expensive, highly-specialized procedures, this factor seems to be of little relevance.