Prosthetic joint infection is probably the most devastating complication following arthroplasty surgery both in terms of cost and patient outcome. Over 16,000 revision hip and knee procedures were recorded in the 10th annual report of the National Joint Registry (NJR) in 2013, 12% of the hip surgery was infection related whilst for the knee, this was 23%. This observation is not limited to NJR data alone; data from the Australian and Scandinavian registries show similar dramatic figures for infection related surgery. With the exponential increase in the number of primary arthroplasties performed worldwide, the burden of infected revision surgery is likely to increase significantly over the coming years. Never has there been a better time to “getting it right first time”.

So, why is the infected arthroplasty becoming an increasing problem for the NHS? There is a changing pattern of bacteria with an increasing number of gram negative bacteria seen, but the gram positives still remain the most common form identified. Increasing bacterial resistance as a consequence of inappropriate antibiotic prescription may well be a major problem for infection control in the future but it is certainly not responsible for the current increase in arthroplasty related infections today. The majority of our hospitals today are generally overcrowded with patients often “hot bedding” in non-dedicated arthroplasty wards as our managers try, at all costs, to achieve their elective admission targets. Whilst the hospital environment may not be perfect, a degree of complacency within the medical and nursing fraternity may well be a contributory factor with the acquisition and chronicity of the infection problem.

Hospital acquired infections in general are among the top four contributors to avoidable adverse events, along with perioperative errors, medication errors and lack of awareness of the deteriorating patient.

The interventions needed to avoid adverse events are often well described, evidence-based, generally simple and non-technical. For elective arthroplasty surgery, this is nothing new. Sir John Charnley, soon after introducing hip arthroplasty surgery in the 1960’s, became acutely aware of the devastating effects of deep infection. So much so that he considered stopping such surgery. However, he decided to continue, but put into place measures to lessen the risk e.g. prophylactic antibiotics, ultra clean air, respect for the soft tissues, amongst many others.

It is customary when assessing risks associated with a surgical procedure to separate into patient factors, surgical factors and the environment of theatre and ward. By focusing on each of these in turn, you are able to identify any risks and their potential solutions.

Although the clinical outcomes associated with infection are devastating, it is relatively rare in a general orthopaedic practice. Infection rates following primary arthroplasty surgery vary tremendously (0.2% to 4%) and if you are not regularly undertaking such surgery in high volumes you will probably see little, if any infection complications. When a complication is not commonly seen, it can be assumed by some not to exist and complacency with prevention of that complication can set in. The use of prophylactic antibiotics is a good example. It is accepted by all that the use of prophylactic antibiotics plays a significant role in the prevention of infection. However, if not administered at the correct time, they have little, if any, effect on the prevention of infection. The effect of this error will probably be delayed in time as most infections tend to be of a chronic insidious nature and so the relevance of the error is often not seen.
The introduction of a safe surgery check list including a surgical site infection bundle has led to a decrease in mortality and a dramatic decrease in the incidence of surgical site infections by up to 50% in a global population (Haynes et al. 1999). It is simple to use, takes little time to implement and should be used as a routine to maintain the awareness of infection and by doing so, helps to prevent its occurrence.

Unfortunately, there is often no strong scientific evidence in peer review publications to support our different attitudes and behaviour towards infection. However, there was strong consensus amongst orthopaedic surgeons and microbiologists to support our approach, which was recently highlighted at the International Consensus Meeting on Periprosthetic Joint Infection, held in Philadelphia in 2013.

With infection being relatively rare in everyday clinical practice, there is often a significant delay in considering infection as a potential reason for failure of that surgical procedure. Infection following arthroplasty surgery presents in many different ways. The majority, do not present acutely with the cardinal symptoms and signs of sepsis, instead the symptoms tend to be rather vague with minimal or no abnormal signs on clinical examination. Suspicion is the key when considering a diagnosis of infection. You need to ask yourself why this patient’s clinical outcome is different despite undertaking the same surgical procedure many times. If in doubt, ask a colleague for their opinion. They may have had similar experiences in the past. Simply delaying helps nobody, least of all your patient.

Acute presentation of infection is much less common than that of chronic infection. Prompt diagnosis and appropriate aggressive management of the early infection can lead to a successful outcome with preservation of the original prosthesis. Unfortunately, time is not on your side, with Biofilm formation starting within hours of exposure to the infecting organism. If a wound is oozing, erythematous or swollen, don’t just prescribe antibiotics blindly and sit on the fence. Either seek advice from a colleague or take the patient back to theatre and explore down to the joint capsule. Take multiple samples, debride, change whatever is exchangeable, prescribe broad spectrum intravenous antibiotics and await culture results. If positive cultures return, you can change antibiotics to be more specific for that particular organism and sit back knowing you have done the right thing for your patient. If they return negative, you can reassure your patient and yourself that there is no infection present and that it was a worthwhile investigatory procedure.

Leaving the patient for another week or two and then exploring would be regarded as inappropriate as the infection is now chronic and the only way to cure the patient would be to perform exchange surgery. This as we all know is far more invasive and costly to both the patient and the healthcare system.

The development of deep peri-prosthetic infection can occur in the best of hands and one should not feel guilty or inadequate if this complication occurs, assuming all preventative measures have been taken. Colleagues acting as medico-legal experts for the plaintiff in a case of alleged medical negligence will find it extremely difficult to win the case if your patient has been appropriately pre-assessed, prophylactic antibiotics prescribed and detailed operative and post-operative clinical records made.

Take home message: if in doubt act promptly, talk to colleagues, work as a team.

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