Lesson of the week

Polyarticular septic arthritis

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Septic arthritis is an uncommon but potentially fatal emergency that can lead to poor functional outcomes of the affected joints. The fact that it can be polyarticular in presentation is insufficiently recognised. We report a case of a patient initially thought to have reactive arthritis who in fact had polyarticular septic arthritis. This case shows the importance of keeping in mind the possibility of septic arthritis and that joint aspiration for microscopy and culture is of paramount importance.

Case report

A 54 year old man was admitted to hospital with polyarthritis affecting both knees and the right wrist. His only medical history was of intermittent episodes of sciatica over the past 14 years. In January 2005 he developed a "bad cold" with a headache and sore throat, along with back pain and sciatica. Five days later he had severe pain and swelling affecting both knees and the right wrist. His polyarthritis was so severe that he was unable to walk and spent four days lying on the floor before his admission to hospital.

On admission, nine days after his first symptoms, he had a fever of 38.3°C and acutely hot swollen knees and right wrist. No neurological signs were present. The admitting team believed that he had reactive arthritis but asked the orthopaedic surgeons to rule out septic arthritis of the right wrist. The orthopaedic opinion was that septic arthritis was unlikely on clinical grounds, and a rheumatology review was suggested.

By the next morning, the patient appeared very unwell and was sweaty and in severe pain. However, he had no fever and was haemodynamically stable. There was a soft systolic murmur at the apex but no other signs of endocarditis. He had diffuse swelling affecting the right hand, wrist, and both knees. We aspirated 40 ml of pus from the right knee and 50 ml from the left knee. Microscopy showed Gram positive cocci, and culture grew *Streptococcus pneumoniae* from both aspirates. Blood cultures also grew *Streptococcus pneumoniae*.

Magnetic resonance imaging of the lumbar spine—which was done in view of the recurrence of the back pain and the sciatica—showed a right psoas abscess with an associated epidural collection and thecal compression. It also showed some degenerative disc disease, with small disc herniations at the L2/L3, the L3/L4, and the L4/L5 levels. Echocardiography showed a trace of aortic and tricuspid regurgitation only, and no vegetations. The chest x ray film was clear.

Investigations showed that the C reactive protein was markedly raised (to 431 mg/l, which would be more in keeping with infection than reactive arthritis), the white cell count was slightly raised (to $11.6 \times 10^9/l$, with a neutrophil count of $10.6 \times 10^9/l$), the creatinine concentration was raised (to 169 $\mu\text{mol/l}$), and the creatine kinase concentration was raised (to 2777 IU/l). The glucose test was normal and the HIV test was negative. The patient was reviewed by a cardiologist who thought that endocarditis was unlikely and that the systolic sound was a flow murmur.

The final diagnosis was streptococcal septicaemia with polyarticular septic arthritis affecting both knees and the right wrist, a right psoas abscess with an associated epidural collection, and renal impairment due to rhabdomyolysis.

We started intravenous flucloxacillin, benzylpenicillin, and gentamicin as soon as the microscopy from the knee aspirates showed Gram positive cocci. The gentamicin and the flucloxacillin were stopped once the sensitivities and the echocardiography results were known. Oral rifampicin was later added owing to persistent fevers. He also had bilateral arthroscopies and washout of the knees, plus open arthrotomy and drainage of the right wrist. Moreover, several knee aspirations were done. The neuroradiologists and the neurosurgeons believed that drainage of the psoas abscess and the epidural collection was not necessary because these were small and the organism was known. Overall, the patient was treated with intravenous antibiotics for six weeks and then with oral phenoxymethylpenicillin and rifampicin for three months.

He was discharged from hospital after six weeks, with intensive physiotherapy. His symptoms of back pain and sciatica resolved, but he has residual fixed flexion deformities of the knees of five degrees, and he needs crutches to walk long distances. He moved to a ground floor flat because of difficulties with stairs. Repeat magnetic resonance imaging of his lumbar spine showed complete resolution of the psoas abscess. Some residual small areas of enhancement were noted at the L4/L5 level facet joints and at the posterior epidural space without any evidence of focal neural compression.

Discussion

This case shows the importance of considering the possibility of polyarticular septic arthritis and aspirating joints urgently when there is doubt.

Septic arthritis can be polyarticular, and joints suspected of harbouring infection should be aspirated urgently

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Algorithm for the management of the hot swollen joint in adults. Adapted from Coakley et al⁵

Dubost et al reviewed 25 cases of polyarticular septic arthritis seen in their department and 184 previously published cases.¹ They compared these with 95 cases of monoarticular septic arthritis from their files and with other cases in the literature.

Fifteen per cent of all cases of septic arthritis were polyarticular, with a mean of three affected joints. The knee joint was most commonly affected, followed by the elbow, the shoulder, and the hip. *Staphylococcus aureus* was the most common pathogen, followed by streptococci. Twenty per cent of patients were afebrile, and leucocytosis occurred in 63%. About half of the polyarticular septic arthritis occurred in association with rheumatoid arthritis, compared with 14% of monoarticular septic arthritis. Other conditions increasing the likelihood of septic arthritis in general were systemic lupus erythematosus, diabetes mellitus, alcoholism, and malignancy. The mortality was 30% for polyarticular disease, compared with 4–8% for monoarticular septic arthritis. Poor prognostic factors were older age (>60 years), rheumatoid arthritis, staphylococcal infection, and delay in diagnosis. In a prospective study on the outcome of bacterial arthritis, a poor outcome of the infected joint was found in 45% of the surviving adults.²

Ross et al reviewed 190 cases of pneumococcal septic arthritis (13 cases from their unit and 177 cases reported since 1965) and found a mortality of 19% in adults, rising to 26% in patients aged over 60.³ Pneumococcal bacteraemia was the strongest predictor of mortality. Polyarticular disease occurred in 36% and bacteraemia in 72%. Only half of the patients had another focus of pneumococcal infection, such as pneumonia. Functional outcomes were good in 95% of the surviving patients. Major risk factors were rheumatoid arthritis and alcoholism.

In conclusion, the possibility of polyarticular septic arthritis should be carefully considered even if patients are afebrile or have a normal white cell count or if several joints are involved, and even if patients are known to have inflammatory arthritis.¹ Joints suspected of harbouring infection should always be aspirated, and this should be done promptly. All junior doctors should be encouraged to gain experience in joint aspiration, especially of the knee. The mortality for polyarticular septic arthritis (30%) is substantially higher than the inpatient mortality for myocardial infarction (10%)⁴ and must be treated as a medical and surgical emergency.

The figure shows an algorithm of the management of the hot swollen joint in adults recently created by a guidelines group that includes the British Society for Rheumatology, the British Health Professionals in Rheumatology, the British Orthopaedic Association, the Royal College of General Practitioners, the British Society for Antimicrobial Chemotherapy, and a patient representative.⁵ The recommendations in the algorithm were based on a systematic review of the literature and evaluation of the evidence using standardised criteria, in keeping with the principles of the Scottish Intercollegiate Guidelines Network (SIGN). We hope that the widespread dissemination and adoption of the recommendations will improve the outcomes for this under-recognised group of critically ill patients.

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