CASE REPORT

Pseudoseptic arthritis resulting in joint destruction

Felicity Page,¹ Sarah Chadwick,² Brian Banerjee³

¹Department of Plastic Surgery, Queen Elizabeth Hospital, Birmingham, UK
²North West Deanery, Manchester, UK
³Department of Trauma and Orthopaedics, Good Hope Hospital, Birmingham, UK

Correspondence to

Felicity Page,
 felicitypage@doctors.org.uk

Accepted 10 April 2015

SUMMARY

Pseudoseptic arthritis is an increasingly recognised entity. It is an inflammatory arthritis that mimics septic arthritis; however, Gram stain and cultures are persistently negative. It is a diagnosis of exclusion. We present the first case, to date, in which pseudoseptic arthritis led to such severe joint degeneration that joint replacement surgery was required. A 54-year-old truck driver with rheumatoid arthritis, on immunosuppressive therapy, presented with acute onset severe left hip pain. He was given a clinical diagnosis of septic arthritis and treated with two prolonged courses of antibiotics despite persistently negative synovial fluid cultures. He experienced progressive joint destruction necessitating a two-stage total hip replacement. A retrospective diagnosis of pseudoseptic arthritis was made. This case demonstrates the difficulties inherent in differentiating between septic and pseudoseptic arthritis. This case also highlights the importance of accurate diagnosis and treatment for pseudoseptic arthritis to avoid accelerated joint destruction.

BACKGROUND

Pseudoseptic arthritis is becoming an increasingly recognised entity.^{1–6} The condition cannot be differentiated from septic arthritis clinically or on laboratory markers, so is often initially treated as septic arthritis. Diagnosis requires sterile synovial Gram stain and culture, and can only be confirmed when other causes of inflammatory arthritis have been excluded.^{5 7–10} Clinicians should have a high index of suspicion for pseudoseptic arthritis when managing a patient with a persistently culture-negative inflammatory monoarthritis.

Our case is unique as our patient experienced accelerated joint degeneration requiring a total hip replacement. Other cases reported have described the arthritis as resolving in days to weeks with no requirements for joint replacement.^{1–15}

This case highlights the challenges to consider when managing culture-negative inflammatory arthritis and the fact that misdiagnosis can be devastating. There are no management guidelines currently for this condition; however, the published literature advocates the use of steroids, either orally or intra-articularly, and the use of other anti-inflammatory drugs.^{1 5 9}

CASE PRESENTATION

A 54-year-old Caucasian man, a truck driver, with quiescent rheumatoid arthritis, presented with acute left hip pain and sudden onset inability to weight bear. His medication prior to presentation included regular methotrexate, low-dose prednisolone and anti-tumour necrosis factor (TNF)

treatment. On examination, he was febrile, had tenderness over the left hip joint line anteriorly, reduced range of all hip movements and pain on all passive hip movements. Investigations revealed raised inflammatory markers (white blood cells 19.5, neutrophils 13.4, C reactive protein 27) suggesting the presence of an acute bacterial infection. History, examination and clinical findings all supported the diagnosis of septic arthritis.

INVESTIGATIONS

Under ultrasound guidance, a purulent effusion was aspirated and sent for microscopy, culture and sensitivities. Antibiotic treatment was then initiated with the working diagnosis of septic arthritis. The patient subsequently underwent a washout of the joint. Bacterial and fungal cultures yielded no growth and no microorganisms were seen on Gram staining. Rheumatology opinion was sought and it was agreed that clinically this acute deterioration was not a flare of rheumatoid arthritis. Septic arthritis remained the top differential diagnosis and the patient continued to be managed as such despite negative microbiology results. Anti-TNF treatment was discontinued on rheumatology advice and the patient went on to complete 6 weeks of antibiotics in line with trust guidelines for the treatment of septic arthritis. Serial blood markers demonstrated an improvement back to normal in the inflammatory markers, his symptoms improved and he returned to his previous ambulatory status.

Over the next 9 months, he developed increasing pain in his left hip and decreasing mobility. Serial radiographs demonstrated accelerated degenerative changes of the affected joint. MRI showed loss of the articular cartilage of the femoral head and acetabulum with postgadolinium enhancement compatible with active infection (figure 1). The patient then underwent a debridement and application of antibiotic cement spacer as a first-stage procedure due to continuing concerns over a persistent bacterial joint infection. Intraoperatively, the hip joint was full of purulent fluid and degenerative changes of the femoral head were seen. Although tissue samples again did not show any microbial growth, he was given a further 6-week course of antibiotics based on these intraoperative findings.

TREATMENT

Six months later, with C reactive protein levels less than 3, the patient underwent the second stage of his hip replacement with revision of the prosthesis to an uncemented total hip replacement. Multiple deep tissue samples taken intraoperatively again failed to yield growth of an offending microorganism. It was at this point, with multiple negative

CrossMark

To cite: Page F, Chadwick S, Banerjee B. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-208269

Figure 1 MRI with postgadolinium enhanced showing destruction of the left femoral head and reduced joint space.

cultures, the final diagnosis of pseudoseptic arthritis secondary to long-term immunosuppressive therapy was made.

OUTCOME AND FOLLOW-UP

At 6 months follow-up, there is no clinical evidence of persisting or unresolved joint infection.

DISCUSSION

Pseudoseptic arthritis is an acute inflammatory monoarthritis with a sterile synovial Gram stain and culture.^{6 10} It is a diagnosis of exclusion, and in the first instance septic arthritis should be ruled out as this is more severe and potentially fatal.^{1 4-6 9 10 12} Pseudoseptic arthritis has been previously described in a number of patients, many of whom have chronic diseases. These include rheumatoid arthritis,^{1 6 10 11} Behçet's disease,^{15 16} pseudogout,¹⁷ gout,^{1 10} relapsing polychondritis^{1 12} and prosthetic joints,¹ following immunosuppressive therapy^{1 13} and after intra-articular injection.^{2 3 7 12} It has also been suggested that there is a link between pseudoseptic arthritis and subsequent development of rheumatic disease.¹⁸ Despite pseudoseptic arthritis gaining recognition, there is little published literature on the topic.

Our patient presented with an acute onset severe hip pain on the background of long-term immunosuppressive therapy for rheumatoid arthritis. Pseudoseptic arthritis in patients with rheumatoid arthritis is a recognised entity;^{4 5 8 9 12-14 18} however, the exact incidence is difficult to determine due to a lack of evidence. It has been suggested that rheumatoid arthritis predisposes to pseudoseptic arthritis^{9 12 18} and that the latter may even be a form of rheumatoid arthritis disease exacerbation.^{5 6 10 19} The acute episode of pseudosepsis may relate to poor disease control or following drug withdrawal.^{10 20} Our patient had relatively well-controlled rheumatoid arthritis and no medications had been altered or withdrawn at that time.

Previous authors have identified a single case of recurrent pseudoseptic arthritis in a patient with rheumatoid arthritis receiving an anti-TNF- α blocker.¹³ The anti-TNF- α blocker was implicated as the cause, however, this is an unlikely aetiology in our patient as there was no correlation between withdrawal of the drug and resolution of symptoms.

Pseudoseptic arthritis is clinically indistinguishable from septic arthritis at first presentation.^{2 4-6 10 11 18 19} It is agreed

that investigations should include inflammatory markers, radiographs, ultrasound and joint aspiration to rule out a septic focus.^{1 2 6 10} In pseudoseptic arthritis, there may be an aspiration that appears purulent, raised inflammatory markers and a fever; however, Gram stains are negative and repeated cultures show no growth.¹⁻¹⁹

There are no clinical guidelines identifying the appropriate management of patients diagnosed with pseudoseptic arthritis. Once a diagnosis of septic arthritis has been ruled out with certainty, antibiotics should be discontinued.^{6 8 18} In some reported cases, rheumatoid arthritis medication was withdrawn,^{12 13} therapeutic arthrocentesis was carried out¹ and combinations of medications were used in the management of pseudoseptic arthritis. These included administration of steroids orally, intravenously or intra-articularly^{1 5 9 13 14 16 20} and the use of non-steroidal anti-inflammatory drugs.^{2 3 5 7 9 14 16} Rehabilitation therapy has also been reported as a useful adjunct to treatment.^{2 3} Oppermann *et al*² state that the condition is not self-limiting and requires intervention including arthrocentesis, steroids or anti-inflammatory medications as part of its management.

The majority of cases in the literature recover in days to weeks following an acute episode of pseudoseptic arthritis.^{1-3 5 9 14} Occasionally, rehabilitation therapy is used for residual joint pain.^{2 12} There are no cases reported that identified joint damage or destruction necessitating joint replacement as a consequence of pseudoseptic arthritis. There is evidence that the condition can recur following initial resolution.^{9 13 14 17} Our patient appeared to have a chronic aspect to his condition rather than any further acute attacks.

Pseudoseptic arthritis should be considered in patients with a long-standing inflammatory condition who present with an acute monoarthritis and no identifiable bacterial source for septic arthritis. Patients with rheumatoid arthritis on immunosuppression are at greater risk of both pseudoseptic arthritis and septic arthritis. Therefore, as a population, these patients should be treated cautiously to ensure that septic arthritis has been excluded, and pseudosepsis is identified and treated in a timely manner. Management to date includes discontinuation of antibiotics, and use of intra-articular or oral steroid therapy and anti-inflammatory medications, often with a rapid resolution of symptoms. Pseudosepsis may lead to joint destruction and the requirement for joint replacement, therefore recognition and appropriate management is important.

Learning points

- ▶ Pseudoseptic arthritis is an inflammatory monoarthritis with negative Gram stain and cultures.
- ▶ The condition is becoming an increasingly recognised entity and patients with rheumatoid arthritis on immunosuppressive therapy appear to be at increased risk.
- ▶ Pseudoseptic arthritis is a diagnosis of exclusion and is clinically indistinguishable from septic arthritis on initial presentation.
- ▶ The condition can be challenging to manage, with no formal guidelines available.
- ▶ We now know that pseudoseptic arthritis can be associated with degeneration of the affected joint, which may require joint replacement surgery.

Acknowledgements The authors thank Mr Giri, Registrar in Orthopaedic Surgery, Good Hope Hospital, for reviewing the article to ensure factual accuracy.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- Garton MJ, Gordon PM, Rennie JAN. Pseudosepsis in rheumatoid arthritis due to cellular and lipid abnormalities in synovial fluid. *Br J Rheumatol* 1992;31:625–6.
- Oppermann BP, Cote JK, Morris SJ, et al. Pseudoseptic arthritis: a case series and review of the literature. *Case Rep Infect Dis* 2011;2011:942023.
- Roos J, Epaulard O, Juvin R, et al. Acute pseudoseptic arthritis after intraarticular sodium hyaluronan. *Joint Bone Spine* 2004;71:352–4.
- McColgan BP, Borchke FA. Pseudoseptic arthritis after accidental intra-articular deposition of pneumococcal polyvalent vaccine: a case report. *Am J Emerg Med* 2007;25:864.e1–3.
- Tahiri L, Benbouazza K, Amine B, et al. Acute pseudoseptic arthritis after viscosupplementation of the knee: a case report. *Clin Rheumatol* 2007;26:1977–9.
- Korkmaz C, Kaşifoğlu T. Development of recurrent pseudoseptic arthritis in a patient with rheumatoid arthritis receiving TNF-alpha blocker. *Joint Bone Spine* 2006;73:767–8.
- Idrissi Z, Benbouazza K, Fourtassi M, et al. Acute pseudoseptic arthritis following viscosupplementation of the knee. *Pan Afr Med J* 2012;12:44. <http://www.panafrican-med-journal.com/content/article/12/44/full/> (accessed on 10 Aug 2014).
- Eberst-Ledoux J, Tournadre A, Makarawez C, et al. Rheumatic disease presenting as septic arthritis: a report of 10 cases. *Rheumatol Int* 2013;33:2153–8.
- Hunter T. Recurrent episodes of pseudoseptic arthritis in rheumatoid arthritis: response to D penicillamine and methotrexate. *J Rheumatol* 1992;19:1484.
- Humby F, Gullick N, Kelly S, et al. A synovial pathology reaction leading to a pseudo-septic arthritis and a diagnosis of Behcet's disease. *Rheumatology* 2008;47:1255–6.
- Mandell BF. 'Pseudoseptic' arthritis. *West J Med* 1986;144:88.
- Singleton JD, Sterling GW, Nordstrom DM. 'Pseudoseptic' arthritis complicating rheumatoid arthritis: a report of six cases. *J Rheumatol* 1991;18:1319–22.
- Call SR, Ward JR, Samuelson CO. 'Pseudoseptic' arthritis in patients with rheumatoid arthritis. *West J Med* 1985;143:471–3.
- Eberst-Ledoux J, Tournadre A, Mathieu S, et al. Septic arthritis with negative bacteriological findings in adult native joints: a retrospective study of 74 cases. *Joint Bone Spine* 2012;79:156–9.
- Bradley JD. Pseudoseptic pseudogout in progressive pseudorheumatoid arthritis. *Ann Rheum Dis* 1987;46:709–12.
- Jones JL. Differential diagnosis of 'pseudoseptic' arthritis. *West J Med* 1986;144:477–8.
- Satoh M, Ajmani AK. Acute exacerbation mimicking 'pseudoseptic' arthritis in rheumatoid arthritis could be caused by abrupt discontinuation of glucocorticoids. *J Rheumatol* 1993;20:1441–2.
- Volpe A, Caramaschi P, Marchetta A, et al. Pseudoseptic arthritis in a patient with Behçet's disease. *Clin Exp Rheumatol* 2006;24(5 Suppl 42):S123.
- Ho G. Pseudoseptic arthritis. *R I Med* 1994;77:7–9.
- Mathur T, Manadan AM, Hota B, et al. Pseudo-septic arthritis as a presenting symptom of ankylosing spondylitis: a case series and review of the literature. *Clin Exp Rheumatol* 2010;28:416–18.

Copyright 2015 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.

BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles
- Access all the published articles
- Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow