

- 18 Ensrud KE, Walczak TS, Blackwell T, Ensrud ER, Bowman PJ, Stone KL. Antiepileptic drug use increases rates of bone loss in older women: a prospective study. *Neurology* 2004;62:2051-7.
- 19 Brodie MJ, Richens A, Yuen AWC. Double-blind comparison of lamotrigine and carbamazepine in newly diagnosed epilepsy. *Lancet* 1995;345:476-9.
- 20 Bill PA, Vigonius U, Pohlmann H, Guerreiro MM, Kochen S, Saffer D, et al. A double-blind controlled clinical trial of oxcarbazepine versus phenytoin in adults with previously untreated epilepsy. *Epilepsy Res* 1997;27:195-204.
- 21 Brodie MJ, Overstall PW, Giorgi L, the UK Lamotrigine Elderly Study Group. Multicenter, double-blind, randomised comparison between lamotrigine and carbamazepine in elderly patients with newly diagnosed epilepsy. *Epilepsy Res* 1999;37:81-7.
- 22 Rowan AJ, Ramsay RE, Collins JF, Pryor F, Boardman KD, Uthman BM, et al. New onset geriatric epilepsy: a randomized study of gabapentin, lamotrigine, and carbamazepine. *Neurology* 2005;64:1868-73.
- 23 Giorgi L, Gomez G, O'Neill F, Hammer AE, Risner M. The tolerability of lamotrigine in elderly patients with epilepsy. *Drugs Aging* 2001;18:621-30.
- 24 Ferrendelli JA, French J, Leppik I, Morrell MJ, Herbeuval A, Han J, et al. Use of levetiracetam in a population of patients aged 65 years and older: a subset analysis of the KEEPER trial. *Epilepsy Behav* 2003;4:702-9.
- 25 Baker GA, Jacoby A, Buck D, Brooks J, Potts P, Chadwick DW. The quality of life of older people with epilepsy: findings from a UK community study. *Seizure* 2001;10:92-9.

(Accepted 30 September 2005)

Lessons of the week

Acute crystal arthritis mimicking infection after total knee arthroplasty

G Holt, C Vass, C S Kumar

Crystal arthritis may mimic infection in a prosthetic joint and should be excluded before surgical intervention

Department of Orthopaedic and Trauma Surgery, Glasgow Royal Infirmary, Glasgow G4 0SF
 G Holt
specialist registrar
 C Vass
senior house officer
 C S Kumar
consultant

Correspondence to: G Holt
 graemeholt@btinternet.com

BMJ 2005;331:1322-3

Total knee arthroplasty is the most effective treatment to relieve the pain associated with end stage arthritis of the knee.¹ A reported 0.5-2% of people will develop sepsis of the implant, necessitating lavage and debridement of the affected knee with immediate or delayed removal of the implant.^{2,3} The key to successful management of implant sepsis is early and accurate diagnosis, which allows prompt treatment. Every patient with pain and swelling at the site of a total knee arthroplasty must, therefore, be assessed for infection.¹ We report a case of a patient initially diagnosed as having implant sepsis who in fact had pseudogout of the knee. This shows the diagnostic difficulties and issues surrounding management that may arise when a patient presents with crystal arthritis at the site of previous joint replacement.

Case report

A previously well 72 year old man presented with a three day history of progressive swelling of the left knee with associated pain, erythema of the skin, tachycardia, and a fever of 38.8°C. Two years before, the patient had had primary total knee arthroplasty surgery of the affected joint for a diagnosis of osteoarthritis. Examination found a reduced range of movement at the knee joint, restricted by pain and swelling. All other joints were normal. Radiographs of the knee were unremarkable and showed no evidence of the implant loosening. Erythrocyte sedimentation rate was raised at 120 mm in the first hour and C reactive protein was raised at 333 mg/l. Full blood count and differential found a total white cell count of $18 \times 10^9/l$, and a neutrophil count of $12.0 \times 10^9/l$. Serum electrolytes, hepatic enzymes, bone markers, and urate were all within normal concentrations. Arthrocentesis was done and 60 ml of turbid synovial fluid was aspirated, which was sent for microbiological and biochemical analysis. Initial Gram stain analysis of the synovial fluid was negative. Microscopy showed a synovial fluid white cell count of $60\,000 \text{ cells} \times 10^6/l$, with a neutrophil population in excess of 90%. In addition to this, numerous rhomboid shaped crystals were noted, which were positively birefringent under polarised light.

The patient had no previous history of crystal arthropathy and in view of the clinical history was admitted with a presumptive diagnosis of implant sepsis.

Later that evening, the patient was taken to theatre for open lavage and debridement. The knee was explored through an anterior approach, and the components seemed well fixed. No frank pus was seen within the joint, and the knee was irrigated thoroughly. Culture of all preoperative joint aspirates, blood cultures, and all intraoperative specimens remained negative for bacterial and fungal growth. Microscopic examination of a specimen of synovial tissue showed a large number of positively birefringent crystals consistent with calcium pyrophosphate dihydrate. After surgery, antibiotics were discontinued and the patient started taking 50 mg diclofenac sodium three times a day. After seven days, the patient had made a full recovery and was discharged to be reviewed at the outpatient clinic.

Discussion

The case shows the diagnostic difficulties that may arise when a person presents with acute crystal arthritis at the site of a previous joint arthroplasty. Both septic and crystal arthritis may present similarly, with joint pain, effusion, erythema, fever, leucocytosis, and raised serum inflammatory markers. In both conditions, analysis of synovial fluid obtained by arthrocentesis typically shows a raised white cell count with a differential neutrophil count typically in excess of 90%.⁴ The diagnosis of crystal arthritis is normally based on the identification of monosodium urate or calcium pyrophosphate dihydrate crystals in synovial fluid examined under polarising light microscopy. Unlike gout, no known serum biochemical markers for pseudogout exist.⁵ Most cases of pseudogout are idiopathic, although it has been associated with ageing, trauma, hyperparathyroidism, Gitelman's syndrome, and haemochromatosis.⁴ The most common sites of deposition of calcium pyrophosphate dihydrate crystals are the knee, wrist, and shoulder.⁶ Non-steroidal anti-inflammatory drugs are the mainstay of treatment,

and the prognosis for resolution of acute attack is excellent.⁴

Acute crystal arthritis (acute gout or pseudogout) of a prosthetic joint is a relatively rare occurrence, and, as such, only a few cases have been reported.⁷⁻¹¹ Although it is of prime importance to exclude implant sepsis, diagnosis of acute crystal arthritis must be excluded as this condition can be treated by simple pharmacological means. Preceding episodes of gout or pseudogout or predisposing medical conditions should raise the possibility of crystal induced arthritis. Physical examination should include a detailed survey to exclude other involved joints. Immediate joint aspiration is indicated in all cases of suspected infected joint arthroplasty and should be among the first diagnostic tests done.¹²⁻¹⁴ The aspirate should routinely be sent for Gram stain analysis; bacterial and fungal cultures; white cell count and differential; and biochemical and crystal analyses.¹⁵ Synovial fluid crystal analysis, Gram stain, and appropriate cultures are the only reliable means of distinguishing between the acute crystal and septic arthritis. Failure or delay in recognising acute gout or pseudogout can lead to inappropriate treatments, such as the unnecessary use of antibiotics, surgical arthroscopy, or removal of the implant. Acute crystal arthritis should be excluded by polarising light microscopy of synovial fluid aspirate before removing implant components.

Contributors: GH and CSK had the original idea. GH and CV wrote the paper and searched for references. All authors cared for the patient. CSK revised the manuscript. CSK is guarantor.

Funding: None.

Competing interests: None declared.

Ethical approval: Not needed.

- Harris WH, Sledge CB. Total hip and total knee replacement. *N Engl J Med* 1990;323:801-7.
- Brause BD. Infected total knee replacement: diagnostic, therapeutic, and prophylactic considerations. *Orthop Clin North Am* 1982;13:245-9.
- Minnema B, Vearncombe M, Augustin A, Gollish J, Simor AE. Risk factors for surgical-site infection following primary total knee arthroplasty. *Infect Control Hosp Epidemiol* 2004;25:A77-80.
- Schumacher HR Jr. Synovial fluid analysis and synovial biopsy. In: Kelley WN, Harris ED Jr, Ruddy S, Sledge CB, eds. *Textbook of rheumatology*. 3rd ed. Philadelphia: WB Saunders, 1989: 637-49.
- Joseph J, McGrath H. Gout or "pseudogout": how to differentiate crystal-induced arthropathies. *Geriatrics* 1995;50:33-5.
- Dieppe PA, Alexander GM, Jones H, Doherty M, Scott DG, Manhire A, et al. Pyrophosphate arthropathy: a clinical and radiological study of 106 cases. *Ann Rheum Dis* 1982;41:371-6.
- Archibeck MJ, Rosenberg AG, Sheinkop MB, Berger RA, Jacobs JJ. Gout-induced arthropathy after total knee arthroplasty: a report of two cases. *Clin Orthop* 2001;1:377-82.
- Blyth P, Pai VS. Recurrence of gout after total knee arthroplasty. *J Arthroplasty* 1999;14:380-2.
- Healey JH, Dines D, Hershon S. Painful synovitis secondary to gout in the area of a prosthetic hip joint: a case report. *J Bone Joint Surg Am* 1984; 66:610-1.
- Williamson SC, Roger DJ, Petrera P, Glockner F. Acute gouty arthropathy after total knee arthroplasty: a case report. *J Bone Joint Surg Am* 1994; 76:126-8.
- Kobayashi H, Akizuki S, Takizawa T, Yasukawa Y, Kitahara J. Three cases of pseudogout complicated with unicompartmental knee arthroplasty. *Arch Orthop Trauma Surg* 2002;122:469-71.
- Levitsky KA, Hozack WJ, Balderston RA, Rothman RH, Gluckman SJ, Maslack MM, et al. Evaluation of the painful prosthetic joint: relative value of bone scan, sedimentation rate, and joint aspiration. *J Arthroplasty* 1991; 6:237-44.
- Barrack RL, Jennings RW, Wolfe MW, Bertot AJ. The Coventry award: the value of preoperative aspiration before total knee revision. *Clin Orthop Relat Res* 1997;345:8-16.
- Duff GP, Lachiewicz PF, Kelley SS. Aspiration of the knee joint before revision arthroplasty. *Clin Orthop* 1996;331:132-9.
- Tsukayama DT, Goldberg VM, Kyle R. Diagnosis and management of infection after total knee arthroplasty. *J Bone Joint Surg* 2003; 85(suppl):S75-80.

(Accepted 29 April)

Pyoderma gangrenosum in ulcerative colitis: considerations for an early diagnosis

K I Papageorgiou, R G Mathew, M G Kaniorou-Larai, A Yiakoumetis

Pyoderma gangrenosum is a poorly understood destructive cutaneous disorder, characterised by progressive painful ulceration.¹ Accurate epidemiological data are missing, but in half of cases there is an associated underlying disease, most commonly inflammatory bowel disease, rheumatological and haematological disorders.²⁻³ As pyoderma gangrenosum is not commonly encountered by clinicians, the diagnosis of such lesions is not always straightforward. We report the case of a man with ulcerative colitis, who presented with a non-healing ulcer of traumatic origin unresponsive to conservative and surgical management. This case emphasises the importance of detailed history taking and the consideration of pyoderma gangrenosum as a differential of such lesions in patients with a background of related systemic disease.

Case report

A 49 year old man was referred to the department of plastic surgery with a two week history of a post-traumatic, painful, and expanding ulcerated area on the anteromedial aspect of the left lower limb. The patient had a past medical history of ulcerative colitis,

which he reported to be in remission for several years and he was currently not on any medication, including steroids. On initial presentation, the lesion was well demarcated measuring 6 × 4 cm with slightly undermined edges. Examination was otherwise unremarkable and conservative management was initiated. A week later, the lesion expanded to 12 × 8 cm, after which we debrided the wound and covered it with a split thickness skin graft. The postoperative course was uneventful, and the patient was discharged.

Six months later, the patient returned with a new ulcerated lesion, adjacent to the previous skin graft. Again, it was reported as post-traumatic. The lesion measured 5 × 8 cm (figure) and was indurated with violaceous undermined edges, atypical of a traumatic ulcer. Cultures were sterile and blood tests showed a normocytic anaemia and raised erythrocyte sedimentation rate.

Cytological examination of scrapings from the ulcer base showed inflammatory features, and there was no bony involvement on radiography. The atypical features of the lesion and the abnormality of the blood tests prompted us to revisit the history. In depth questioning found that the ulcerative colitis was not inactive

Appropriate evaluation and critical interpretation of findings are essential for early diagnoses of pyoderma gangrenosum

Department of Ophthalmology, Broomfield Hospital, Chelmsford, CMI 7ET
K I Papageorgiou
senior house officer
R G Mathew
senior house officer

continued over

BMJ 2005;331:1323-4