Case Report

CLOSTRIDIUM PERFRINGENS HIP ARTHRITIS IN A HAEMODIALYSIS PATIENT

Ho TT[1], Labriola L[1], Jouret F[1], Yombi JC[2], Lecouvet F[3], Jadoul M[1], Demoulin N[1]

[1]Divisions of Nephrology, [2]Infectious Diseases and [3]Radiology, Cliniques universitaires Saint-Luc, Université catholique de Louvain, Brussels, Belgium

Correspondence and offprint requests to: Nathalie Demoulin, E-mail: nathalie.demoulin@uclouvain.be

ABSTRACT

Haemodialysis patients have acquired immunity disturbances, co-morbidities and a vascular access, factors predisposing them to infection and bacteraemia. *Clostridium perfringens* is an anaerobic bacterium potentially causing severe infections, including rarely septic arthritis. We report the first case of *Clostridium perfringens* septic arthritis in a haemodialysis patient and suggest a haematogenous spread. After rapid joint lavage combined with appropriate anti-microbial therapy, the patient recovered.

Key words: septic arthritis, *Clostridium perfringens*, haemodialysis

INTRODUCTION

Haemodialysis (HD) patients have acquired immunity disturbances, co-morbidities and a vascular access, these factors predisposing them to infection and bacteraemia (1-3). The type of vascular access is the most important predictor of infection, with native arteriovenous (AV) fistulas being safer than AV grafts [relative risk (RR) of bloodstream infection of 1.47 when compared to AV fistulas], and cuffed central venous catheters (RR 8.49) (4). Most bacteraemia in HD patients are caused by Gram-positive pathogens, predominantly *Staphylococcus aureus* and *Staphylococcus epidermidis*, and are frequently associated with metastatic complications (mainly endocarditis and osteoarticular infections) (3).

Clostridium perfringens is an anaerobic bacterium, potentially causing severe infections, such as gas gangrenes and food borne toxin-mediated infection, and rarely septic arthritis (5). We report the first case of *Clostridium perfringens* septic arthritis in a haemodialysis patient.

CASE REPORT

A 36-year-old Caucasian man presented to our HD unit in November 2009 with hyperglycaemia (479 mg/dl), fatigue and persistent right hip and calf pain since 2 days. He had been examined in the emergency unit the day before, and conventional radiography of the hip showed no fracture or increased peri-articular soft-tissue density. Trochanteric tendinitis was diagnosed and the patient was sent home with analgesics. His medical history included type1-diabetes mellitus with advanced retinopathy leading to blindness and diabetic nephropathy, chronic hepatitis C and alcohol and past drug (cocaine and heroin) use. HIV testing was negative in July 2009. He was on HD for the last 3 years via a right internal jugular tunnelled catheter and was receiving acenocoumarol (anti-vitamin K, a derivative of coumarin) since 2007 for a *superior vena cava* thrombosis. He had a low socioeconomic status and had been repeatedly hospitalised for severe hypoglycaemia. His regular medications included aspirin, insulin, losartan, omeprazole, sevelamer, amlodipine and calcium carbonate.

At the HD unit, the patient complained of chills. There was no diarrhoea or abdominal pain. Clinical examination showed tachycardia (120 bpm), low blood pressure (90/50 mmHg), body temperature of 37°C, right hip pain with impaired mobility and painful decreased range of movement. The dialysis catheter exit site was clean and there was no sign of tunnel infection. Blood tests showed a C-reactive protein plasma level of 8 mg/dl (NL < 1 mg/dl) and a white blood cell count of 13.000/mm3. A bloodstream infection was suspected, blood cultures were obtained and the patient was treated with vancomycin because of a recent *Staphylococcus epidermidis* exit site infection. On the following day, blood cultures grew a Gram-positive *bacillus*. An arthro-CT-scan of the right hip was performed and diagnostic arthrocentesis yielded 1 ml of cloudy fluid, suggesting septic hip arthritis. Right hip arthrotomy and lavage were immediately performed. Blood (1/1 set), hip fluid (3/5 sets) and biopsy of the capsule of the hip joint (1/1 set) cultures all grew *Clostridium perfringens*.

Vancomycin was switched to intravenous (iv) penicillin (1.6 million IU four times a day) and iv clindamycin (600 mg three times a day). Hip pain rapidly decreased and the patient recovered normal hip mobility 6 weeks after the initiation of antibiotics. After 2 weeks of IV antibiotics, the patient insisted on being discharged. The therapy was thus shifted to oral amoxicillin (500 mg three times a day) and clindamycin (300 mg four times a day) after 2 weeks, and administered for a total of 6 weeks. Although catheter-related *Clostridium perfringens* bacteraemia was suspected, a colonoscopy was proposed to search for a digestive origin to the bacteraemia, but the patient refused. The patient presented no skin defect on inspection, and had no contact with pets or other animals.

DISCUSSION

Blood stream infection is a leading cause of morbidity and mortality in dialysis patients (2, 3, 6). After stratification for age, the risk of fatal sepsis is approximately 100-fold higher in dialysed patients than in the general population (6). The vascular access is implicated in up to 89% of bacteraemia in HD patients (3). Patients with a central venous catheter have a greater risk of bacteraemia than those with a native AV fistula (2, 4). A retrospective analysis of HD patients in three centres in the United Kingdom showed a < 0.5% yearly incidence of microbiologically proven septic arthritis (7). This study identified 15 cases of septic arthritis over a 6-year period, with the knee joint affected in 11/15 cases. Patients had a mean age of 67 years and 47% were diabetics. Synovial fluid and blood cultures grew *Staphylococcus* species in 13/15 cases and *Streptococcus* species in the other 2 cases. The source of sepsis was the vascular access in 12/15 cases. One patient died of sepsis, and two developed chronic osteomyelitis.

Septic arthritis is rarely caused by anaerobic bacteria, and less than 40 cases due to *Clostridium* species have been reported in the general population (5, 8). *Clostridium perfringens* is present in contaminated food and in soil, and causes severe infection such as gas gangrenes and food borne toxin-mediated infections. Septic arthritis due to *Clostridium perfringens* is very rare. In the litterature 14 cases have been reported (5). The aetiology was post-traumatic for 7 of them, haematogenous for only 2 of them, and unknown or not reported for the last 5. The joint involved was the knee for half of them, and one case affected the hip. The treatment was arthrotomy and antibiotics (penicillin, cefotaxime or vancomycine) in 10 of them. The treatment of choice is iv penicillin. Because the patient refused to stay hospitalised, we shifted to oral penicillin and clindamycin. Oral clindamycin has been successfully used in bone infections, in mono- or bitherapy, although mostly in *staphylococcus aureus* infections (9-11). In most published cases of *Clostridium species* arthritis, arthrotomy or arthroscopy was necessary (5).

Although metastatic septic arthritis secondary to *Staphylococcus aureus* bacteraemia in HD patients is not uncommon, our case is the first report of *Clostridium perfringens* septic arthritis in a HD patient. No traumatic wound or skin defect was identified and we speculate that the bacteraemia was catheter-related. We cannot however exclude, in this past iv drug user, a transmission through a contaminated iv drug needle. The tunnelled catheter was not removed as the patient rapidly improved and subsequent blood cultures were negative. The patient had no abdominal complaint and refused colonoscopic investigation. Our patient was treated classically, with iv penicillin and emergency arthrotomy and lavage.

CONCLUSION

We report the first case of *Clostridium perfringens* septic arthritis in a HD patient and suggest a haematogenous spread via the tunnelled catheter. Our report is original in 2 ways: septic arthritis in HD patients is usually secondary to vascular access-related *Staphylococcus species* bacteraemia. Secondly, septic arthritis due to *Clostridium perfringens* is very rare and mostly secondary to a traumatic, penetrating injury, and only rarely to a haematogenous spread. A prompt diagnosis and medico-surgical treatment is important: our patient recovered completely.

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