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An Unusual Case of Hip Septic Arthritis due to *Bacteroides fragilis* in an Alcoholic Patient

Summary: We describe a 53-year-old alcoholic man who presented with hip septic arthritis due to *Bacteroides fragilis*. This arthritis involved a severe destruction of the femoral head, which was completely devitalized. Recovery was achieved after 4 months of antimicrobial therapy with imipenem/cilastatin plus metronidazole, surgical debridement of the necrotic tissues and four sessions of hyperbaric oxygen.

Introduction

Recent studies document the enhanced frequency of anaerobic pathogens, especially *Bacteroides* spp., from clinical specimens [1]. *Bacteroides fragilis* is the most commonly isolated anaerobic organism. This pathogen would account for about 9% of cases of anaerobic joint infection reported in the literature [2, 3]. Most of these cases of arthritis have been attributed to hematogenous spread from an infected focus, mostly intraabdominal [3]. This joint infection could present problems in diagnosis and management. We report an uncommon case of hip *B. fragilis* arthritis and review 17 additional cases.

Case Report

A 53-year-old man had only one predisposing condition: chronic alcoholism. There was no past history of trauma, bone or joint disease and he never took any medications. Three days before admission, he suddenly developed in his left hip a violent pain with high fever leading to invalidity. On admission, the physical examination revealed a corpulent man complaining of pain on mobilization of his left hip, even when restrained. His temperature was 40.5°C, blood pressure 100/70mm Hg, pulse 120/min and respiratory rate 30/min. There was neither abdominal tenderness nor splenomegaly. The liver was palpable, 4 cm below the right costal margin. The left hip was edematous with swelling, erythema and warmth facing the trochanter, but without crepitations. Other joints were normal. A neurological examination revealed confusion and an onset of delirium.

Laboratory data on admission included a white blood cell count of 15,000/mm^3 with 85% segmented neutrophils and an erythrocyte sedimentation rate (ESR) of 120 mm/h. Echocardiography and cerebrospinal fluid were normal. *B. fragilis* was isolated from blood cultures on the first day after admission. This organism did not produce indole. It was identified using gas liquid chromatography combined with the determination of the biochemical profile. Unfortunately, the antibiotic susceptibility could not be determined, because the strain did not grow subcultures. Radiographs of the left hip were unremarkable (Figure 1). Computed tomography (CT scan) revealed a severe osteolysis of the femoral head with gas bubbles inside it and in the joint (Figure 2).

The patient was started on therapy with amoxicillin/clavulanic acid, 2 g over 30 min q. 8 h i.v.. Because of clinical inefficiency, a combination of imipenem/cilastatin plus metronidazole (1 g over 30 min q. 8 h i.v., 500 mg over 30 min q. 8 h i.v. respectively) was substituted 6 days later, and surgical intervention was planned. The procedure was an arthrotomy by a lateral approach, which disclosed severe destruction of the femoral head. The macroscopic aspect of the bone was highly suggestive of septic arthritis, with a typical "wet sugar" appearance. Radical surgery with amputation of the femoral head was suggested, but not carried out. A large resection of the devitalized head and neck was performed (Figure 3) with curettage and joint lavage for 3 days. Anaerobic cultures of the bone specimens were negative. Four sessions of hyperbaric oxygen therapy (3 A.T.A.) were carried out on and after the first postoperative day. Temperature only decreased after the first session and a good clinical evolution was eventually achieved. The drainage of the joint without addition of antimicrobials was performed daily for 7 days. The traction of the hip was continued for 12 weeks.

The combination of imipenem/cilastatin plus metronidazole was discontinued after a total of 8 weeks. Oral clindamycin plus minocyclin were continued for 2 months. Abdominal CT scan and colonoscopy showed only an uncomplicated sigmoid diverticulosis. The patient walked after obtaining ankylosis with freedom from pain and good functional position. He had 30 degrees of active flexion and needed a cane for prolonged walking. He has remained well 2 years after the antibiotic treatment was stopped.

Discussion

Involvement of the hip in cases of *B. fragilis* arthritis is exceptional. Only four cases including the present case have been reported. Two of the previous cases of hip *B. fragilis* osteoarthritis involved a prosthetic joint and required removal of the prosthesis [1, 4]. The third patient was receiving corticosteroids and developed septic polyarthritis due to *B. fragilis* in nine joints [5].

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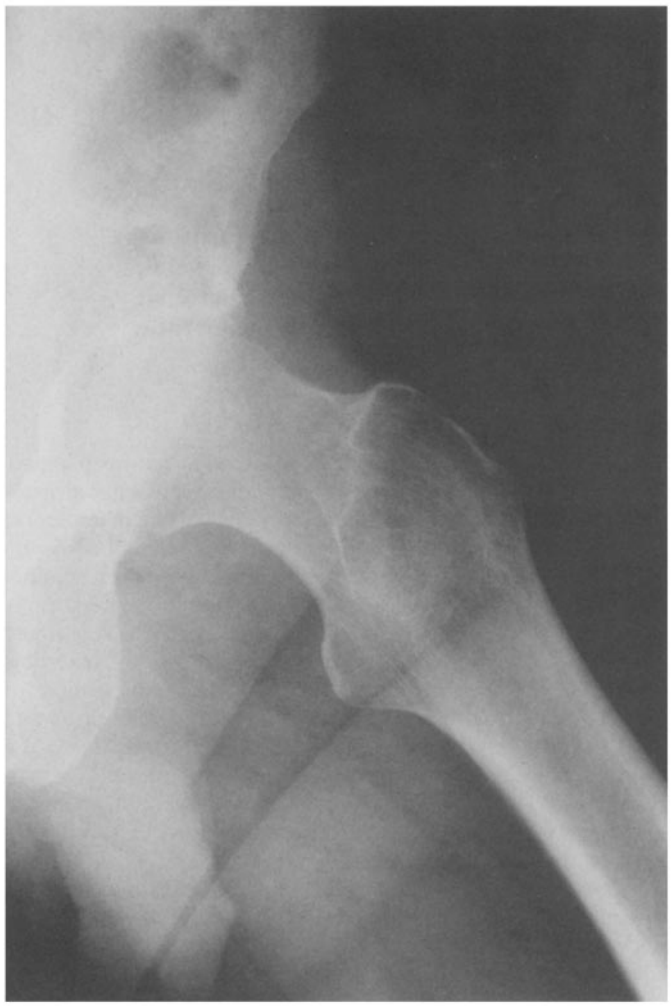

Figure 1: Initial X-ray film of the femoral head.

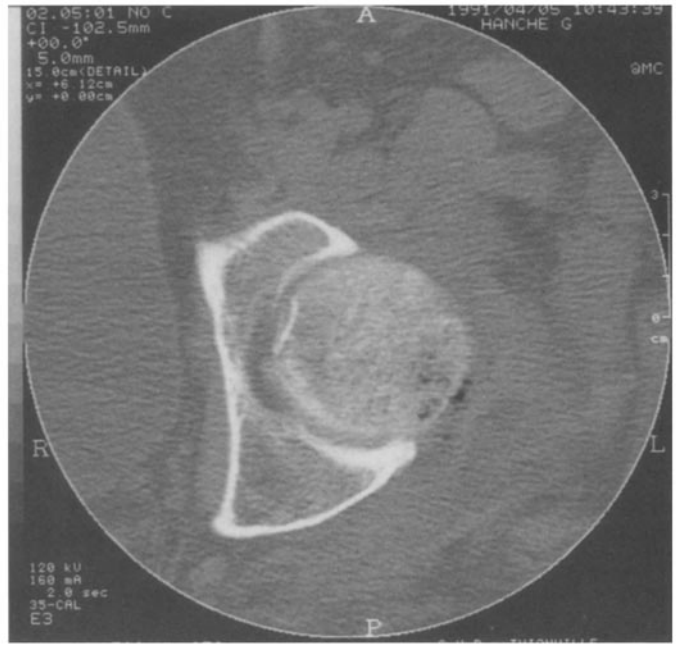

Figure 2: Initial CT scan: destruction of the left femoral head with small black dots representing gas bubbles inside it and in the soft tissue, suggestive of anaerobic arthritis.

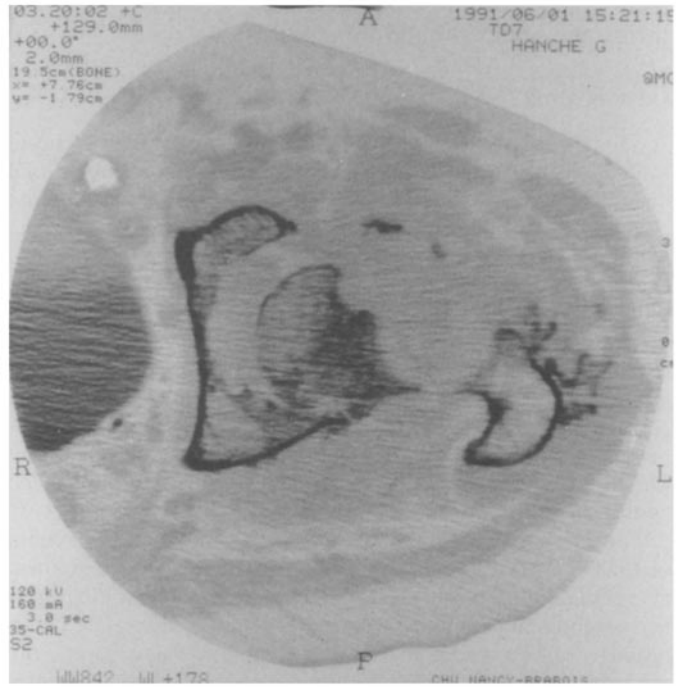

Figure 3: Postoperative CT scan showing the large resection of the femoral head. Only posterior cortex was spared. An important infiltration in the nearby periarticular soft tissues was noted.

To date, 17 patients have been reported as having true *B. fragilis* arthritis, defined as the presence of pathologic evidence of septic arthritis with the isolation of *B. fragilis* in pure culture from joint fluid, tissue contiguous with the site of infection, or blood [1, 5–13]. In all these patients, *B. fragilis* was isolated from blood or joint fluid only after needle aspiration of the involved joint. Unlike these cases, our patient had only a history of alcoholism but no antecedent of trauma, steroid or immunosuppressive therapy.
In the present case, the severe destruction of the hip joint should be noted, though X-ray films of the hip did not show significant lesions (Figures 1 and 2). It would appear that it is the first case with such severe damage of the joint due to *B. fragilis*. This damage could explain the clinical inefficacy of antibiotic therapy adequate according to sensitivity testing. *B. fragilis* isolates from Beauregard Hospital were always sensitive to amoxicillin/clavulanic acid. The failure to isolate *B. fragilis* from the joint was probably due to prior antimicrobials. However it should be emphasized that adequate anaerobic cultures of the bone specimens are extremely difficult during the surgical procedure.

Medical imaging could significantly help achieve a positive diagnosis. CT scan reveals the severity of injuries in the joint involved, and the presence of gas bubbles in the joint, which is suggestive of anaerobic arthritis (Figure 2).

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The appropriate choice of antimicrobial therapy may be critical in such cases. Metronidazole and clindamycin appear to be the antibiotics of choice for treatment of *B. fragilis* joint infection [4]. In patients able to be cured with antibiotics and needle aspiration of the superficial joints [1], an early surgical drainage of hip infections should be recommended. In the present case, the surgical treatment was very difficult because of the severity of the damage in the joint. However, removal of the femoral head was avoided.

Hyperbaric oxygen therapy is controversial, but should perhaps be complementary in the management of such severe anaerobic arthritis. *Schreiner* et al. [5] had previously reported two patients with *B. fragilis* septicemia successfully treated with hyperbaric oxygen therapy. In our case, the femoral head was completely destroyed and without any vascularity. It would probably be impossible to obtain an adequate antibiotic concentration in the infected tissue. Moreover, necrotic tissue and sequestra provided a favorable environment for the optimal growth of anaerobic organisms. In such cases, hyperbaric oxygen could help to reach appropriate concentrations of oxygen in the diseased areas.

The development of *B. fragilis* hip arthritis in an alcoholic patient suggests the possibility of involvement of all joints in patients with factors associated with *Bacteroides* bacteremia. Diagnosis can sometimes be difficult. Surgical debridement is most often necessary. However, hyperbaric oxygen therapy could perhaps be an adjunctive treatment in the management of anaerobic septic arthritis if the preservation or restoration of the blood supply in the involved area is not possible.

Zusammenfassung: Ein ungewöhnlicher Fall von septischer Hüftarthritis durch *Bacteroides fragilis* bei einem Alkoholiker. Wir berichten über einen Fall von septischer Hüftarthritis durch *Bacteroides fragilis* bei einem 53 Jahre alten Alkoholiker. Die Arthritis führte zu einer schweren Femurkopfzerstörung mit völliger Devitalisierung. Nach chirurgischem Debridement des nekrotischen Gewebes, 4 Monaten Behandlung mit Imipenem/Cilastatin und Metronidazol und vier Behandlungen mit hyperbarem Sauerstoff trat Heilung ein.

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