Prosthetic Hip Joint Infection Due to Campylobacter fetus

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A case of postoperative prosthetic hip joint infection due to Campylobacter fetus subsp. fetus is described. Difficulties in isolation and antimicrobial susceptibility testing of this organism are discussed.

Campylobacters are major causes of gastrointestinal infections in humans (2). Extraintestinal infections due to this group of pathogens may occur and are usually the result of hematogenous seeding of distant sites by the bacteria (1, 6). Among these nonenteric sites of infection, septic arthritis caused by Campylobacter spp. is rare (1, 4, 5, 7, 8). We report herein a case of campylobacter infection involving a prosthetic hip joint.

A 75-year-old man presented with 3-month duration of pain in his right hip joint. He had undergone a right total hip arthroplasty for severe osteoarthritic degeneration of the right hip joint 7 years previously. He was diagnosed with chronic lymphocytic leukemia and autoimmune hemolytic anemia 3 years previously, for which he received periodic erythrocyte transfusions and oral prednisone at 10 mg daily. There was no history of recent trauma to his right hip. He denied any fever, chills, or sweats. Examination of the right hip revealed markedly limited range of motion with crepitus, but there was no percussion tenderness or erythema around the joint. His peripheral leukocyte count was 146.4 × 10^9/liter (95% lymphocytes). With the diagnosis of prosthetic hip joint degeneration, he underwent surgical replacement of the entire prosthesis with perioperative cefazolin prophylaxis. Intraoperative cultures of the joint fluid and bone were negative after 4 and 7 days of incubation, respectively. On day 7 postoperatively, erythema and tenderness were noted around the right hip incisional wound, and some yellow, seropurulent discharge was present. The patient remained afebrile, with a peripheral leukocyte count of 81.7 × 10^9/liter. A culture swab of the discharge was obtained.

The Gram-stained smear of the discharge showed a few polymorphonuclear neutrophils without visible bacteria. The swab of the discharge was inoculated onto Columbia blood agar, MacConkey agar, chocolate agar, and fastidious anaerobic blood agar (FAA; Lab M, Bury, United Kingdom) and fastidious anaerobe broth (FAB; Lab M) medium. After 72 h, pure growth of tiny, pinpoint colonies were present on the chocolate agar incubated in 5% CO_2, while the FAA showed uniform small, convex, grey colonies. No growth was observed on MacConkey agar or FAB. No organism was seen on a Gram-stained smear of the FAB after 7 days under ambient conditions, and subculture from this broth onto Columbia blood agar was negative under microaerophilic conditions after 48 h at 42°C. Gram-stained smears of the colonies revealed spiral-shaped gram-negative bacilli of various lengths. Reactions for catalase, oxidase, and nitrate reduction were positive, whereas tests for hippurate hydrolysis and H_2S production were negative. The organism exhibited darting motility and grew under microaerophilic (5% O_2) conditions at 25 and 35°C but grew poorly at 42°C. It did not grow under ambient atmosphere. A zone of growth inhibition was present around the cephalothin disk but not around the nalidixic acid disk. This bacterium was identified as Campylobacter fetus subsp. fetus, which was later confirmed by the Ontario Public Health Reference Bacteriology Laboratories.

The patient was placed on intravenous imipenem and gentamicin therapy. Because of persistent seropurulent drainage from the surgical wound, surgical debridement of the infected prosthetic hip joint was undertaken on postoperative day 25. Intraoperative cultures of joint soft tissues and bone were negative. The patient was discharged on postoperative day 35 to continue oral amoxicillin for long-term suppressive therapy.

Campylobacter infections of the joint are very rare. Thus far, 16 reports of such infections have appeared in the English and French language literature (1, 4, 5, 7, 8), and C. fetus accounted for 14 of these cases. These infections may occur with or without bacteremia and were associated with various underlying illnesses, including immunocompromised state, malignancy, alcoholism, cirrhosis, diabetes, and preexisting joint diseases (such as that of our patient). The prosthetic hip joint infection in our patient occurred postoperatively, probably as a result of hematogenous spread of the organism from his gastrointestinal tract. Our patient was immunocompromised as a result of his underlying chronic lymphocytic leukemia. Interestingly, he did not have gastrointestinal or systemic symptoms and signs preceding or during the hip joint infection. However, since stool and blood cultures were not obtained, one could not rule out with certainty the presence of C. fetus gastroenteritis or bacteremia.

Campylobacter spp. are fastidious, slowly growing gram-negative bacilli which require selective, enriched media with prolonged incubation (≥72 h) under microaerophilic conditions for primary isolation from clinical specimens (10). To our surprise, C. fetus was isolated from the hip incisional wound drainage of our patient in pure culture on the chocolate agar and FAA plates at 72 h. Campylobacter spp. would be easily missed in clinical laboratories where primary isolation media inoculated with joint fluid or tissue specimen are kept routinely for 48 h with or without microaerophilic condition. Although a Gram-stained smear of the FAB (after 7 days of incubation) was negative, the presence of the organism in the FAB could not be ruled out with certainty since the broth was not subcultured appropriately for the isolation of C. fetus. Later studies in our laboratory using the patient's isolate indicated good growth of the organism in FAB (50 μl of a broth inoculum at a 0.5 McFarland standard in 10 ml of FAB) after 48 h of incubation at 35°C under

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ambient or microaerophilic (5% CO₂) conditions. The growth was much better under microaerophilic than ambient conditions. Probably the bacterial inoculum size in the patient’s wound specimen was so small that the organism failed to grow in the FAB under ambient conditions.

We speculate that the occurrence of joint infections due to Campylobacter spp. may be more frequent than that reported in the literature, for two reasons. Firstly, most clinical microbiology laboratories, including ours, do not routinely keep primary isolation media (inoculated with joint specimens from patients suspected of having septic arthritis) incubated beyond 48 h. Secondly, unless campylobacter infection of the joint is suspected, specimens from infected joints in most laboratories are not routinely inoculated onto enriched media capable of supporting the growth of campylobacters.

At present, antimicrobial susceptibility testing of Campylobacter spp. remains controversial, since most campylobacter infections are self-limited and do not require specific treatment. However, severe infections, especially those with extraintestinal involvement, necessitate antimicrobial therapy. Of concern is the recent increased incidence of antimicrobial resistance in campylobacters (3, 9). Currently, there are no guidelines from the National Committee for Clinical Laboratory Standards for the susceptibility testing of Campylobacter spp. Agar dilution is the most reliable method of testing campylobacters (10), but disk diffusion methods have also been described (11). In severe cases with poor or no clinical response to antimicrobial therapy, susceptibility testing of the campylobacter isolates should be performed, with the understanding that such testing is not yet standardized.

REFERENCES