Campylobacter fetus-associated Epidural Abscess and Bacteremia: a Case Report

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Campylobacter fetus has been isolated as an infrequent cause of abscesses. We report a case of Campylobacter fetus epidural abscess and bacteremia in a debilitated elderly man who has a fatal outcome.
CASE REPORT

A 83 year old European man presented to his general practitioner with a non-specific febrile illness that was treated with oral flucloxacillin. While on this treatment he developed bilateral lower leg erythema and lower back pain. The erythema progressed over about 10 days and he became systemically unwell and presented to hospital. On admission he had fever, confusion, unsteadiness, painful legs, diarrhoea and fecal incontinence. He also complained of increasing dyspnoea, angina and mild productive cough for 2 days. This patient also had multiple other medical problems including class III ischemic heart disease, previous coronary bypass operation, congestive heart failure, previous aortic aneurysm repair, previous perforated duodenal ulcer, history of malignant melanoma of the forehead, mild Parkinson’s disease, and chronic obstructive pulmonary disease.

On admission, the patient was afebrile (36.4 °C) with a blood pressure of 82/31 mmHg, a heart rate of 86/min, a respiratory rate of 28 breaths per minute, a peripheral blood oxygen saturation of 90% on air and a blood glucose concentration of 13.4 mmol per liter. Clinical examination revealed bibasal crepitations, bilateral painful, erythematous shins, and no obvious neurological deficit. Haematological investigations showed the haemoglobin concentration was 112 g per liter, the platelet count was 125 $\times 10^9$ per liter, the creatinine concentration was 0.19 mmol per liter (normal range 0.05-0.11 mmol per liter), the urea concentration was 12.5 mmol per liter (normal range 2.7-7.8 mmol per
liter) and the troponin T was raised at 0.43 µg per liter (normal range < 0.03 µg per liter).

The provisional diagnoses made at the time were bilateral leg cellulitis, concurrent left ventricular failure, probable chest infection and dehydration. He was treated with intravenous flucloxacillin (2 gram six hourly) and subcutaneous enoxaparin with clinical improvement of the cellulitis. He complained of increasing lumbar back pain over L2 to L4 region and developed decreased knee reflexes and bilateral leg weakness. The blood cultures taken on day 4 during an episode of fever and diarrhoea, became positive 2 days after incubation with a *Campylobacter* species. Oral ciprofloxacin (500 mg twice daily) was added to the treatment regimen. A subsequent magnetic resonant imaging scan showed an epidural abscess of 51x10x12mm extending from L3-L4 disc to L4-L5 disc with marked compression of the theca. An emergency L4 laminectomy and drainage procedure was performed on the same day. An aspirate of this epidural abscess was sent for microbiological examination and *Campylobacter* species was cultured. Postoperatively he was treated with intravenous cefotaxime (1 gram twice daily).

An underlying immunosuppressive condition was suspected and subsequent investigations showed an abnormal serum protein profile showing a monoclonal band in the β region. Results of a subsequent bone marrow examination were
inconclusive and a diagnosis of monoclonal gamma-globulinopathy of uncertain significance was made.

He was treated with cefotaxime (10 weeks) followed by oral ciprofloxacin, with MRI resolution of the epidural abscess. His clinical condition gradually improved and he was transferred to a rehabilitation hospital on day 25 of his admission. However, the clinical course was subsequently complicated by intermittent diarrhoea, *Clostridium difficile* enterocolitis and an episode of sepsis. He died on day 63 after his admission. A post-mortem was declined by the family.

Blood cultures taken on day 4 of admission during this patient’s febrile episode were incubated in the automated BacT/ALERT system (Organon Teknika Corporation, Durham, N.C). Both aerobic and anaerobic bottles became positive after 2 days of incubation with faintly staining, motile, gram negative bacilli. The organism was subcultured onto 5% sheep blood agar, chocolate agar and MacConkey agar. The plates were incubated at 36 °C in a 5% CO₂ environment. The sheep blood agar plate was incubated in a microaerophilic environment at 42 °C. After 24 hours of incubation, colonial forms were present. The organisms were identified as *Campylobacter species* by morphology on wet preparation, a positive catalase test, resistance to nalidixic acid and susceptibility to Cephalothin. *Campylobacter species* were also isolated from MacConkey agar plate, Chocolate agar, Aztreonam agar and *Campylobacter* selective agar. The second bottle of the same set of blood cultures also grew a *Campylobacter*
species. By non-standardised disc sensitivity tests, the isolate was sensitive to erythromycin, gentamicin, ciprofloxacin, ceftriaxone, clindamycin, tetracycline and chloramphenicol. There was no obligate anaerobe isolated. The epidural abscess aspirate received 3 days later was identified similarly.

Further identification was performed by 16S rRNA sequencing (12), using big dye terminator kit v3.0 and ABI prism 3100 genetic analyser (Applied Biosystems). The partial sequence was then compared to 74 sequences from representative taxa in the class Epsilonbacteria (that includes Campylobacter, Arcobacter and Helicobacter, among others) using established methods (10). The sequence was 100% similar to equivalent sequences derived from the type strains of the two Campylobacter fetus subspecies. The ability of the strain to grow at 42°C and on MacConkey agar are characteristic traits of Campylobacter fetus subsp. fetus (11).

Campylobacter fetus subsp. fetus was originally isolated from aborted cattle and has been isolated from aborted human fetuses whose mothers were infected in the second trimester. The major reservoirs are cattle and sheep and it usually causes opportunistic infection in debilitated hosts. The usual source of isolation is the bloodstream. It is less commonly isolated from faeces. In comparison to Campylobacter jejuni, C. fetus subsp. fetus tends to cause more invasive disease and has a predilection for vascular sites. The affected patients are less likely to present with abdominal pain or diarrhoea. Cases of C. fetus bacteremia have
been noted to be associated with cutaneous manifestations, often described as cellulitis (Carbone et al 1985, Ichiyama et al 1998, Schonheyder et al 1995, Briendis et al 2002, Cone et al 2003, Rapp et al 2007). Many of these cases have a multifocal nature to the cellulitis. In comparison with the other campylobacter infections, patients with invasive *C. fetus* infections have a more prolonged clinical course and usually have a higher mortality.

*C. fetus* has also been associated with abscesses. According to the available literature, it has been isolated from cases of brain abscess (7), gluteal abscess (2), colonic abscess (5), and pulmonary abscess (1). Cases of meningoencephalitis, septic arthritis, spontaneous bacterial peritonitis, pelvic infection, pericarditis, endocarditis, mycotic aneurysms of the abdominal aorta, thrombophlebitis, empyema, urinary tract infection, cholecystitis and vertebral osteomyelitis (16) have also been described. Other *Campylobacter* species that have been reported to be isolated from abscesses include *Campylobacter curvus* from hepatic abscesses (15), oral Campylobacter from breast, liver abscess and pneumonia (4), *C. jejuni* from liver abscesses (15) and a perirectal abscess (6), *Campylobacter upsaliensis* from a breast abscess (3), and *Campylobacter sputorum* from an axillary abscess (9).

To our knowledge, this is the first reported case of an epidural abscess caused by *C. fetus*. It is presumed to be of bacteremic in origin as the blood cultures were positive after admission, and are likely to have been positive for some time.
It is possible that this represented a cutaneous manifestation of the systemic *C. fetus* infection. Our patient was a debilitated, elderly, retired office worker in whom we did not find any documented exposure to farm or animals prior to his hospital presentation. It remains clinically unclear regarding the source or portal of entry of *C. fetus*.

*C. fetus* infection is uncommon but in patients with back pain or progressive neurological deficit particularly in the setting of multiple medical problems, immunosuppression and cellulitis, it is worth considering this as a possible causative organism. Patients with *C. fetus* may not necessarily have prolonged bacteremia and may require invasive procedures to obtain appropriate specimens from metastatic deposits to make the microbiological diagnosis and direct antimicrobial treatment. Our patient illustrated the clinical associations of *C. fetus* infection and adds to the evidence that these infections have a high mortality.
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REFERENCES


