A 14-month-old girl without predisposing factors presented to the hospital with a 2-day history of limping and fever. The child had one liquid stool 6-7 days before hospitalization. She had fallen from a slide 3 days before admission. On admission, the patient was febrile, and had exquisite tenderness and swelling of the left knee. The initial white blood cell (WBC) count was 15.6 × 10^9/L (38.6% neutrophils); the C-reactive protein (CRP) level and the erythrocyte sedimentation rate (ESR) were 9.3 mg/dL and 82 mm/h respectively. X-ray of the knee showed an osteolytic lesion in the right distal femur close to the metaphysis (Brodie abscess), with moderate soft tissue edema. Bone scintigraphy with technetium-99m showed intense increased uptake in the region of the lytic lesion seen on the X-ray. A provisional diagnosis of distal femoral osteomyelitis was made.

The patient was treated empirically with intravenous cefotaxime (25 mg/kg every 6 h) and oxacillin (25 mg/kg every 6 h).

Blood cultures obtained before the initiation of antibiotics yielded Campylobacter jejuni HS 15 phage type 8. Stool cultures obtained after the initiation of antibiotic treatment were negative. The organism was susceptible by disk diffusion to ampicillin, amoxicillin-clavulanate, ofloxacin, chloramphenicol, and erythromycin. E test for ampicillin, amoxicillin and erythromycin revealed minimal inhibitory concentrations (MICs) of 8, 6 and 3 μg/mL respectively. Antibiotic treatment was changed to parenteral ampicillin (50 mg/kg every 6 h) and oral clarithromycin (10 mg/kg every 12 h) on the basis of culture results and sensitivity testing. The patient's pain and limping improved within the first days of therapy. The leukocyte count and CRP value returned to normal after 5 days. The ESR decreased to 39 mm/h. After 3 weeks of parenteral antibiotic therapy, all biological markers were normal. The child's regimen was switched to oral amoxicillin and clarithromycin for an additional 3 weeks.

Further evaluation of the patient was undertaken in light of the unusual organism recovered. Paired sera obtained on admission and after 3 weeks from the patient showed seroconversion for C. jejuni, confirming systemic infection by this organism (positive titer equal to 64 by complement fixation method). The results of immunoglobulin quantification and T-cell enumeration (CD3, CD4, CD8) were within normal limits. The results of evaluation of complement (CH50 and alternative pathway) were also within the normal range. The child tested negative for HIV.

C. jejuni and C. coli account for approximately 5-10% of all cases of diarrhea in European countries. C. jejuni causes a self-limited illness associated with fever, abdominal pain and diarrhea that usually resolves within 2 weeks. Extraintestinal manifestations of Campylobacter infection that have been reported in children include bacteremia, pancreatitis, meningitis, and perinatal and other focal infections. We report what is, to our knowledge, the first pediatric case of osteomyelitis probably caused by C. jejuni. This patient presented with hematogenous osteomyelitis, probably resulting from the spread of the organism from the gastrointestinal tract, although stool cultures obtained after the initiation of antibiotics were negative. The X-ray diagnosis of a Brodie abscess is also consistent with hematogenous osteomyelitis.

C. fetus and, less frequently, C. jejuni have already been reported to cause septic arthritis and osteomyelitis. Osteomyelitis caused by C. fetus has been reported in both compromised and immunocompetent patients by several authors. In contrast to C. fetus, C. jejuni osteomyelitis has only been described by Petersen in two immunocompromised adult patients. Another possible case of osteomyelitis has been described by Joaquín, but, on review of the case history, Campylobacter causing osteomyelitis was not proven, and there were other complicating features.

The low propensity of C. jejuni to cause osteomyelitis or other systemic infections is probably related to its high susceptibility to killing by serum. In contrast, C. fetus possesses a high-molecular-weight surface protein that completely disrupts Csb binding to this organism and protects it against humoral immunity and phagocytosis.
Microbiological investigations identify the etiologic agent of osteomyelitis in 50–55% of cases. Staphylococcus aureus is the most common cause of osteomyelitis in both adults and children. Group B Streptococcus and Escherichia coli are the next most commonly identified organisms. Haemophilus influenzae type b, formerly one of the major causes of osteomyelitis in children younger than 2 years of age, has virtually disappeared in areas where infant vaccination against this organism has been widely implemented. In recent years, with improving diagnostic techniques, unusual microorganisms, including Enterobacteriaceae, HACEK, Bartonella, and Rickettsia, have increasingly been recognized as causes of osteomyelitis in immunocompetent children. Osteomyelitis and septic arthritis are the most frequent manifestations of Kingella kingae systemic infection in children. This organism has been reported to account for up to 22% of septic arthritis in children. Recently, Robson et al reviewed cat scratch disease-related osteomyelitis in 12 immunocompetent patients, 10 of whom were children. Osteomyelitis, mainly localized to the vertebral bodies, is an unusual ostearticular complication of childhood brucellosis. Arthralgias and arthritis are more frequently described complications of childhood brucellosis. Osteomyelitis is a well-recognized manifestation of melioidosis, and should be considered in children from endemic areas. Subacute osteomyelitis due to Borrelia burgdorferi has also been described. Fungal and mycobacterial osteomyelitis occur mainly in immunocompromised hosts.

Because of the broad spectrum of potential etiologic agents, an array of different microbiological techniques must be used in the diagnostic workup. Blood, bone and/or joint fluid specimens should be cultured on regular culture media as well as in the Bactec blood culture system (Becton Dickinson Microbiology Systems, Cockeysville, MD, USA), as recommended by Birgisson et al. Moreover, blood culture should be prolonged to allow recovery of fastidious microorganisms. Serology is an important tool for the diagnosis of pathogens such as Bartonella henselae, Brucella abortus, and Mycoplasma. They should be used when culture and serology do not contribute to the etiologic diagnosis, as for osteomyelitis caused by Lyme disease.

The management of acute hematogenous osteomyelitis in children is primarily medical. Surgical drainage is rarely indicated in uncomplicated acute osteomyelitis. The first-line antimicrobial treatment of osteomyelitis would be a broad-spectrum parenteral regimen directed against common etiologic agents. However, the possible role of newly identified agents should be kept in mind if the response to first-line therapy is not satisfactory. The choice and duration of antibiotic treatment must be based on the sensitivity of etiologic organisms.