

Isolation of *Pantoea agglomerans* in Two Cases of Septic Monoarthritis after Plant Thorn and Wood Sliver Injuries

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Arthritis after plant injury is often apparently aseptic. We report two cases due to *Pantoea agglomerans*. In one case, the bacterium was isolated only from the pediatric blood culture media, BACTEC Peds Plus, monitored in BACTEC 9240, and not from the other media inoculated with the joint fluid. This procedure could help improve the diagnosis of septic arthritis.

CASE REPORTS

Case 1. A 13-year-old boy, 50 kg in weight, was admitted to the hospital for sepsis with arthritis of the right knee. One month before, he had run a thorn into his knee after falling into a bush. Two days later, joint aspiration produced a yellow inflammatory-looking fluid which was not analyzed. Twenty-three days later, the knee had swollen again, and so a second aspiration was performed. The fluid was clear and contained 4,000 leukocytes/mm³ with 90% polymorphonuclear leukocytes. Cultures were negative on the usual media, Chocolat Polyvitex (BioMérieux, Marcy l'Etoile, France) in CO₂, Columbia colistin-nalidixic acid agar (BioMérieux) in CO₂, 5% horse blood Trypticase soy agar (BioMérieux), and Schaedler broth (BioMérieux). Four days after the second aspiration and 3 days before admission, he developed a fever (39°C) and chills. On admission, the knee was tender, warm, and swollen. He still had a fever. Clinical examination showed no adenopathy or other septic localization. Abnormal laboratory findings included a leukocyte count of 12,610/mm³ with 73% neutrophils, a C-reactive-protein level of 221 mg/liter, and a erythrocyte sedimentation rate of 68 mm/h. Radiographs of the knee were normal. Arthrocentesis yielded 120 ml of purulent fluid containing 850 erythrocytes/mm³, 170,000 leukocytes/mm³, and 88% polymorphonuclear leukocytes. Direct examination was negative. Bacterial growth was detected 17 h after inoculation of the fluid (3 ml) in a BACTEC Peds Plus F broth (Becton Dickinson, Meylan, France) incubated at 37°C in BACTEC 9240 (Becton Dickinson). A gram-negative bacillus was observed and was subcultured to Chocolat Polyvitex (BioMérieux). It was identified as a *Pantoea* sp. by an ID-32E system (BioMérieux). BACTEC Peds Plus F contains a soybean-casein digest broth, resins, CO₂, and a fluorescence sensor. BACTEC 9240 (Becton Dickinson) detects increases in CO₂ produced by microorganisms. No growth was observed on the other two culture media, 5% Columbia sheep blood (BioMérieux) in an anaerobic jar with a gas-generating envelope (AnaeroGen; Oxoid, Basingstoke, England) and Chocolat Polyvitex (BioMérieux) in CO₂ (CO₂ Gen; Oxoid), each inoculated with 0.05 ml of the fluid. Antimicrobial susceptibility testing was performed with rapid ATB-E strips (BioMérieux). The isolate was resistant to fosfomicin and mecillinam and

susceptible to other antibiotics. The patient was first treated for 48 h with 1 g of amikacin intravenously (i.v.) and 4 g of oxacillin i.v. The latter was replaced by 6 g of cefotaxime i.v. Local treatment included immobilization, daily aspiration, and after eight days, joint irrigation by arthroscopy followed by 160 mg of intra-articular gentamicin. A *Pantoea* sp. was isolated from the first three daily aspirations from BACTEC Peds Plus F alone and not from the other two media. Synovial fluid cultures were negative thereafter. After 16 days, amikacin and cefotaxime were replaced by oral amoxicillin (3 g/day) and minocycline (2 g/day) with a favorable outcome.

Case 2. A 36-year-old woman with systemic lupus erythematosus treated by hydroxychloroquine alone was hospitalized 19 days after having injured her left thumb in a fall against a wooden fence post. She presented with septic arthritis of the interphalangeal joint. Her leukocyte count was 6,330/mm³ with 80% neutrophils, 4.25 g of fibrinogen per liter, and a erythrocyte sedimentation rate of 40 mm/h. A surgical excision yielded pus and a 1-cm-long wood sliver in the thumb pulp. *Pantoea agglomerans* was isolated from 5% sheep blood agar plates, both inoculated with a swab and cultured at 37°C, one in an aerobic environment and the other in an anaerobic environment. The septic arthritis was cured by a 3-month treatment of oral amoxicillin-clavulanate (2 g/day) and ciprofloxacin (2 g/day).

Discussion. *P. agglomerans*, formerly named *Enterobacter agglomerans* (5), is a ubiquitous *Enterobacteriaceae* that is found in plants and in the feces of humans and animals. It is less often implicated in infection than *Enterobacter aerogenes* and *Enterobacter cloacae* and usually complicates debilitating illnesses (10). In the absence of preexisting disease, septic arthritis is rare, particularly in children or infants (6). Of the 294 patients admitted for septic arthritis to our hospital between 1979 and 1998, the two in this report were the only cases in which *P. agglomerans* was isolated (2). In systemic lupus erythematosus, increased susceptibility to infection is common during flares, in cases of severe disease, and during steroid therapy. None of these factors were present in our second patient, and the first patient had no risk factor. It is noteworthy that in one patient the source of contamination was a plant thorn and in the other a sliver of wood in contact with plants and that the incubation period before hospitalization was longer than 3 weeks. In both of the two other documented cases infection was also due to plant material contamination (3, 8). However, several cases of febrile, apparently aseptic, synovitis after plant injury have been reported (8, 11, 12).

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Opinion differs on the role played by plants in the onset of long-lasting monoarthritis (4, 9). Most authors who failed to isolate microorganisms assumed that it results from hypersensitivity or toxic reactions (1, 8). False negative results of bacterial culture are frequent in septic arthritis, being estimated at 10 to 20% (7); therefore, bacterial origin should not be ruled out (4). The use of blood culture media for joint fluid is much debated. Several authors have reported improved performances with blood culture media, especially for the detection of fastidious organisms (2, 13, 14). The advantage of inoculating the fluid into blood culture vials is diluting complement, antibodies, antibiotics, and other factors that inhibit the growth of microorganisms (14). This was borne out in the first patient, especially with the samples taken on the second and third days after the beginning of the antibiotic treatment. In the second patient, the bacteria grew on agar media. One possible explanation is that the pus contained higher concentrations of bacteria than did the large volume of synovial fluid aspirated from the first patient. The sample taken was in contact with the wood sliver, which was still embedded in the thumb.

To our knowledge, there is no previous report on the use of BACTEC Peds Plus F broth for joint fluid culture. In the first patient, it was the only medium that allowed bacterial growth. This result was confirmed in three instances. If it had not been used, the diagnosis would have been inflammatory sterile arthritis due to thorn injury. Direct bedside inoculation of BACTEC Peds Plus by the clinician who performs arthrocentesis could increase the sensitivity of bacterial isolation.

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