Pseudomonas aeruginosa sepsis presenting as peripheral subcutaneous nodules. Report of 2 cases

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Received: 30 April 1987; accepted: 27 October 1987

Abstract. Two patients developed disseminated subcutaneous nodules with febrile illness. In both cases, Pseudomonas aeruginosa was isolated from the lesions; blood cultures yielded the same organism in one case, and were negative in the other. The portal of entry was thought to be a jugular hemodialysis catheter in the first case and a necrotic zoster complicating lymphoma in the second case. Both patients' condition improved with antibiotic therapy and the Pseudomonas nodules resolved without surgical drainage.

Key words: Pseudomonas aeruginosa septicemia - Pseudomonas cutaneous infections

Cutaneous manifestations of Pseudomonas aeruginosa septicemia present with very variable clinical pictures, the most characteristic being ecthyma gangrenosum. Disseminated subcutaneous nodules have rarely been reported: only five reports, a total of 16 cases have appeared in the literature. We present two cases of Pseudomonas aeruginosa sepsis presenting as disseminated subcutaneous abscesses, which were cured with antibiotics.

Report of cases

Case no. 1: A 76-year-old woman presented with fever of 4 weeks duration. She had a 6-year history of chronic hemodialysis for end-stage renal failure; an internal jugular venous access had recently been used. Three weeks before admission, two blood culture sets grew Staphylococcus epidermidis and the patient was given vancomycin (750 mg intravenously every 8 days). Fever resolved for only a few days, but recurred thereafter at a level of 38–38.5°C. Three days before admission, the right leg was amputated because of gangrene related to previous vascular access for hemodialysis; culture samples were not obtained from the gangrenous leg. On the next day, the patient experienced fever of 39°C with chills; the jugular catheter was removed, but fever persisted. Two days later, on admission, the patient appeared severely ill; cardiac, pulmonary and neurologic examination were normal; the complicated vascular access appeared devoid of any infectious process; multiple red, hot, painful, indurated, nonfluctuant subcutaneous nodules were noted, predominating on legs and arms. The jugular scar and the amputated leg showed no inflammation. The white blood cell count showed 12x10⁹ leucocytes/l with 85% neutrophils. Echocardiography was normal.

The jugular catheter grew Pseudomonas aeruginosa serotype O10, but six blood cultures taken on admission and the day before, i.e. 1 day after removal of the jugular catheter gave no growth. Biopsy of one of the subcutaneous nodules disclosed polymorphonuclear leucocytes with scanty gram negative bacilli: cultures yielded the same Pseudomonas aeruginosa O10 as recovered from the catheter (susceptible to carbenicillin and aminoglycosides): pathologic examination revealed necrotizing sub-dermal abscess with normal dermis and epidermis (Fig. 1). Treatment with ticarcillin (2.5 g IV twice a day) and tobramycin (75 mg IM after every dialysis) was started at admission and given for a two-weeks duration; oral ciprofloxacin (500 mg twice a day) associated with tobramycin were then administered for two more weeks. Serum bactericidal titers (<0.01% of surviving bacteria) were 1:64 at peak and 1:16 at trough with ticarcillin-tobramycin combination and 1:8 at peak with ciprofloxacin-tobramycin association.

The patient became rapidly afebrile. The stump became supplicative by day 2, with culture samples
Painful, erythematous and nodular subcutaneous lesions developed. The patient was transferred to our hospital. Five blood cultures and a cutaneous vesicle aspirate yielded \textit{Pseudomonas aeruginosa} (resistant to carbenicillin and gentamicin, susceptible to azlocillin and tobramycin). Treatment was started with azlocillin and tobramycin; a gradual defervescence was obtained while the cutaneous lesions resolved without fluctuation; persistent suppuration with \textit{Pseudomonas aeruginosa} (double population with the same antibiotic susceptibility as first isolate) of the breast zoster needed surgical debridement. Steroid therapy (prednisolone 25 mg/day) was maintained. Peak and trough serum bactericidal titers were 1:16 and 1:8 respectively. The patient completed a 1-month antibiotic course with complete resolution of the subcutaneous nodules, but a post-zoster necrotic wound persisted on the left mid-thorax. A few months later, lymphoma was diagnosed and the patient placed on a chemotherapeutic regimen.

\textbf{Comments}

\textit{Pseudomonas aeruginosa} septicemia is associated with a wide variety of cutaneous manifestations, ecchyma gangrenosum being the most typical [1]. Disseminated subcutaneous abscesses, associated with \textit{Pseudomonas aeruginosa} septicemia, are uncommon. In the previously reported cases, the diagnosis has relied on blood cultures [2-4]. In our first patient, the negativity of blood cultures might be explained by the removal of the catheter 1 day before the blood sets were taken. The diagnosis was thus made by culture of the skin biopsy specimen, which yielded the same organism as the one isolated from the jugular catheter, considered to be the origin of dissemination. In both our cases, a prolonged course of antibiotic therapy (30 days) provided complete resolution of the cutaneous nodules with no sequelae. Surgery was not required, while in 4 previous cases, surgical drainage was felt necessary [2, 3], due to persistent deep, fluctuant, disseminated subcutaneous abscesses despite intravenous antibiotic therapy. However, susceptibility testing of \textit{Pseudomonas aeruginosa} was not detailed in three cases, and serum bactericidal titers were not provided in any of these cases.

The finding of disseminated subcutaneous nodules in a patient with clinical sepsis should suggest the