A Man with a Saccular Aneurysm of the Left Common Iliac Artery

(See pages 902–3 for the Photo Quiz)

Diagnosis: A mycotic aneurysm due to *Burkholderia pseudomallei*.

Laboratory and radiographic investigations (figure 1) suggested an infectious aneurysm, and cultures of blood and an artery tissue specimen grew a gram-negative bacillus that was identified as *B. pseudomallei*, confirming a mycotic aneurysm.

Members of the family Enterobacteriaceae (*Klebsiella* and *Yersinia* species), *Pasteurella*, and *Bacteroides* demonstrate bipolar staining on gram-stained smears [1]. *Yersinia pestis* exhibit bipolar staining, which gives it a “safety pin” appearance, and it is nonmotile. *B. pseudomallei* and *Pseudomonas stutzeri* should be considered when a nonfermentative, wrinkled colony is isolated. *B. pseudomallei* is a gram-negative rod that exhibits bipolar staining in Gram stains; it is described as having a safety pin appearance (figure 2). *B. pseudomallei* is a strict aerobe, it is motile, and it oxidizes glucose and lactose (*P. stutzeri* does not use lactose) [2]. It was identified on the basis of a positive blood and artery tissue culture result within 48 h after the samples were obtained, Gram stain findings, colonial morphology, biochemical characteristics, and 16S mRNA sequencing results (figure 3).

Whitmore and Krishnaswami [3] described an infective disease in Rangoon (Burma) in 1912. This disease, termed melioidosis by Stanton and Fletcher in 1932 [4], was caused by a gram-negative environmental bacterium that has been named *Bacillus pseudomallei, Bacillus withmorii, Pseudomonas pseudomallei*, and, since 1992, *B. pseudomallei* [5].

*B. pseudomallei* is an important pathogen in humans and in a wide variety of animal species in areas of endemicity, including horses, sheep, cattle, goats, pigs, cats, and dogs [6]. Pneumonia is the most common clinical presentation of infection in humans [7]. Melioidosis is endemic in Southeast Asia and Northern Australia. The incidence in most African countries is unknown, because diagnosis requires bacteriologic confirmation by culture, which is a technique that is not available...
everywhere. Melioidosis is underdiagnosed, and unconfirmed cases have been reported from Burkina Faso (Upper Volta) [8].

Mycotic aneurysms are most frequently caused by Staphylococcus aureus and non-Typhi serotypes of Salmonella [9]. Melioidosis presenting as mycotic aneurysm is rare and is associated with high morbidity, mortality, and relapse rates [10].

Three modes of acquisition—inhalation, ingestion, and inoculation—are recognized for Burkholderia pseudomallei. It is present in the soil and water in areas of endemicity. Six cases of melioidosis were recently diagnosed in survivors of the 26 December 2004 tsunami in southern Thailand who had been immersed in contaminated salt water [11]. Our patient did not have a history of a wound contaminated with soil or water, and the precise mode of acquisition was unclear. Inoculation events are identified in 5%–25% of cases [12]. Melioidosis can remain latent for periods of up to 62 years [13].

B. pseudomallei is intrinsically resistant to the combination of penicillin and aminoglycosides, and the failure of this regimen suggests the diagnosis in an area of endemicity. Ampicillin, erythromycin, and first- and second-generation cephalosporins are also inactive [14]. The treatment of choice is cefazidime (administered at a dosage of 40 mg/kg by intravenous injection every 8 h, with a total dosage of 120 mg/kg per day). It should be given for at least 10 days to treat systemic infections. The switch to oral treatment should be made when there is clinical improvement and should be given until 20 weeks of therapy have been completed [7]. A large randomized trial proved imipenem therapy to be equivalent to cefazidime therapy [15]. Imipenem therapy has been recommended by the European Medicines Agency at a dosage of 50 mg/kg per day for the treatment of suspected or confirmed cases [16].

Our patient was treated with intravenous imipenem for 3 weeks, followed by maintenance therapy with trimethoprim-sulfamethoxazole and doxycycline to reduce the risk of relapse. He underwent a surgical resection of the aneurysm with graft interposition. He continues to do well 6 months after presentation.

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References

13. Nguy V, Lemeshev Y, Sadkowski L, Crawford G. Cutaneous melioidosis presenting as mycotic aneurysm is rare and is associated with high morbidity, mortality, and relapse rates [10].

Figure 3. Wrinkled colonies of Burkholderia pseudomallei visible after incubation at 37°C for 72 h on chocolate agar.

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