A Case of Nonfatal Cutaneous Melioidosis

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Melioidosis is a tropical infectious disease caused by the gram-negative bacterium Burkholderia pseudomallei. *It is endemic in many parts of the world, including Southeast Asia, and has a mortality rate of about 45%. We report a case of localized nonfatal cutaneous melioidosis presenting as a persistent ulcer in an otherwise healthy young woman.*

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Melioidosis in humans was first described in Burma in 1912 by Whitmore and Krishnaswami.[1] Sporadic reports of the disease followed until the Vietnam War when US soldiers fighting in Vietnam were infected, which led to the disease's emergence as a global problem. Melioidosis is endemic to regions bordering 20° north and south of the equator.[2] In Singapore, the first case report was made in 1931 by Gilmore.[3] Since then, there has been a steady increase in the number of cases found in Singapore, with a mean annual rate of 1 case per 100,000 people and a case fatality rate of close to 40%.[4] We report a case of nonfatal cutaneous melioidosis in a healthy young woman.

Case Report

A 19-year-old Chinese woman presented with a 4-month history of a chronic ulcer on her left shin. The ulcer initially started as an insect bite that became further traumatized after the patient fell into a drain. The nodule subsequently broke down into an ulcer discharging pus. After failing 2 courses of treatment with cephalexin and cloxacillin, the patient was referred to the National Skin Center for further management.

At presentation, the patient had a 3.5×2-cm ulcer on her left shin. The ulcer was tender with a serosanguineous crust on a granulomatous base (Figure 1). Systemic examination revealed no abnormalities.

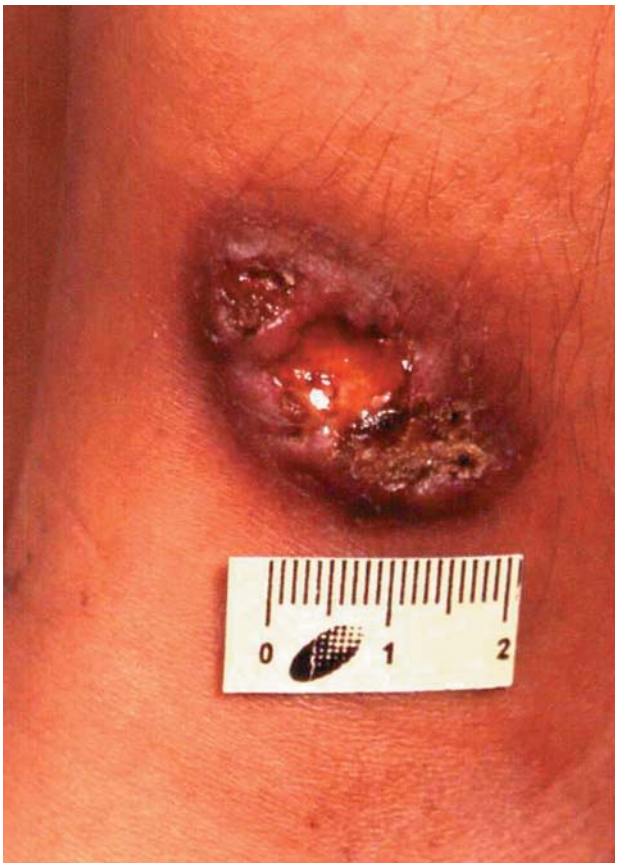

Figure 1. A 3.5×2-cm ulcer on a granulomatous base on the shin.

Initial investigations included full blood counts and a wound culture. The patient's blood counts were normal, and the wound culture yielded no bacterial growth. The results of a skin biopsy showed compact hyperkeratosis and parakeratosis with aggregates of neutrophils. Infiltrates of polymorphonuclear, lymphocytic, and plasma cells were seen in the dermis. No granuloma, acid-fast bacilli, or fungus were seen (Figure 2).

The patient was reviewed 2 weeks later. Because cutaneous melioidosis was included as a differential diagnosis, a repeat wound culture was performed on Ashdown medium that subsequently grew *Burkholderia pseudomallei*. Results of a shin

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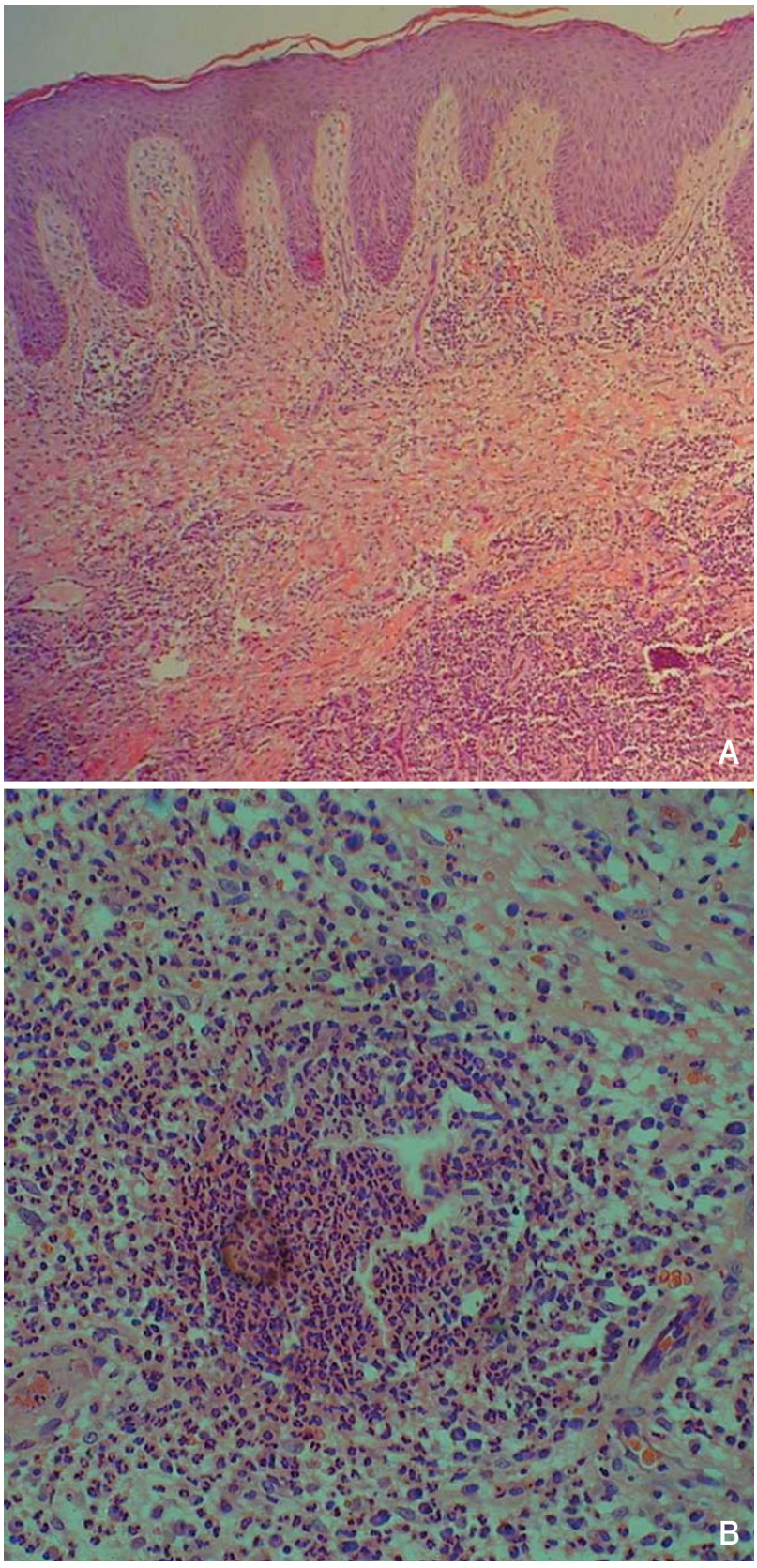

Figure 2. Epidermis showing regular psoriasiform hyperplasia with a dense infiltrate of polymorphonuclear and lymphocytic cells. No granuloma was seen (A and B)(H&E, original magnifications ×40 and ×100).

x-ray revealed no associated osteomyelitis. Retrospectively, a nested polymerase chain reaction (PCR) also was performed on the tissue sample for *B pseudomallei* and it yielded a positive result within 24 hours.

The patient was treated with 625 mg of amoxicillin-clavulanate twice a day for 3 months and 100 mg of doxycycline twice a day for 6 months. On follow-up one month later, the ulcer had healed completely with no recurrences after 6 months.

Comment

B pseudomallei has been listed as a category B biological warfare agent. It supposedly was used during World War I by Germany against several countries, including the United States. Cultures of *B pseudomallei* and anthrax were distributed to undercover agents who attempted to infect livestock that were to be shipped to allied countries. The intention was to destroy the livestock, as well as to transmit the highly contagious lethal agent from livestock to humans.[5] It is suspected that attempts are being made to develop an aerosolized form of antibiotic-resistant *B pseudomallei* that could become a biological weapon as potent as anthrax.

Other than its potential use as a biological weapon, it is important to note that melioidosis also is endemic in many countries, and infection could result from contamination of open wounds with bacteria found in soil and surface water. This case report demonstrates a community-acquired nonfatal form of melioidosis presenting as a chronic ulcer in an otherwise healthy young adult. Other than being exposed to possibly contaminated surface water in the drain into which she fell, the patient had no other risk factors that are commonly associated with melioidosis, such as diabetes mellitus, renal diseases, or thalassemia.[6] During

presentation, the differential diagnosis of a chronic ulcer included infective causes, autoimmune/vascular diseases, hematologic disorders, and dermatitis artefacta. Autoimmune causes such as systemic lupus erythematosus, rheumatoid arthritis, and pyoderma gangrenosum can be excluded with a detailed history and physical examination, while infective causes can be confirmed by wound and tissue cultures.

In this case, the diagnosis of cutaneous melioidosis was made by a positive wound culture of *B pseudomallei* performed on Ashdown medium. It is interesting to note that the first wound culture, which was performed on MacConkey agar, was negative. This demonstrates the importance of using Ashdown medium for wound culture for melioidosis. Up to 40% of melioidosis cases would be missed if wound cultures were performed on normal culture media.[7] Recently, PCR also has been used for the rapid detection of *B pseudomallei*. The advantage of using the PCR technique is obvious, especially in cases of septicaemic melioidosis for which early diagnosis is imperative for patient survival—the disease has a mortality rate of close to 90% in the first 48 hours after hospital admission.[8,9] PCR for *B pseudomallei* has a reported sensitivity of 95.2% and a specificity of 91.7%.[10] In our case, we performed PCR on the tissue sample taken from the ulcer using conventional nested PCR. A positive result for *B pseudomallei* was obtained within 24 hours compared with one week for the wound culture.

Treatment in this case was with amoxicillin-clavulanate for 3 months and doxycycline for 6 months. The ulcer showed good healing after one month of amoxicillin-clavulanate therapy. The prolonged treatment to 6 months was based on recommendations of the Cochrane Review for the management of melioidosis.[11]

Conclusion

Our case demonstrates some pertinent points with respect to localized nonfatal cutaneous melioidosis. First, there usually is a history of exposure to soil or contaminated surface water. Second, the patient typically presents with a persistent nonhealing ulcer despite multiple courses of antibiotics. When cutaneous melioidosis is suspected, a wound culture should be performed on special media like Ashdown to improve yield. PCR also is a useful tool for diagnosing cutaneous melioidosis, especially in cases of septicemic melioidosis where time is of the essence in the management of the patient.

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