Diagnosis: Brucellosis of the Spleen

The culture revealed *Brucella suis* (Figure 1C), which confirmed the diagnosis of brucellosis, also known as “undulant fever.” The patient, who had presented to a medical institution in Minnesota in the 1960s with the described findings, had probably acquired the disease during the handling of animals at his workplace. The diagnosis was initially suggested by the classical presentation of “waves” of fever. It was further supported by the detection of splenic calcifications on the abdominal radiograph (Figure 1A), as well as the detection of splenic calcifications on the resected spleen specimen (Figure 1B). Other diseases that can present similarly include lymphoma, histoplasmosis, and tuberculosis. Echinococcosis can also cause splenic calcifications but is usually not associated with fever.

Brucellosis is a zoonotic disease caused by members of the genus *Brucella*. It was first described by Sir David Bruce, a British Major General who investigated the cause of Malta fever (which at that time was thought to be a form of typhoid fever) while he was posted in Malta [1].

The species of *Brucella* that are known to cause disease in humans are *B. abortus*, *B. suis*, *B. melitensis*, and *B. canis*. Major areas where brucellosis is endemic include Mediterranean countries, western Asia, and parts of Africa and Latin America [2]. In the United States, approximately 100 cases are reported every year [3]. Since the mid-1970s, the epidemiology of brucellosis has changed from an occupational disease primarily affecting men in the meatpacking and rendering industries (as described in this case) to a foodborne illness primarily affecting people who consume unpasteurized milk and cheese from outside of the United States [4]. This is likely secondary to the introduction of preventive measures, including vaccination of animals, pasteurization of milk, quarantine or slaughter of infected animals, separation of killing areas from processing areas in slaughterhouses, and use of protective clothing and disinfectants among slaughterhouse workers. Occupational exposure does occur among laboratory personnel, who can acquire the infection during the manipulation of culture plates containing *Brucella* species [5, 6].

![Figure 1](https://academic.oup.com/cid/article-abstract/55/3/469/611898)

*Figure 1.* A, Abdominal radiograph showing splenic calcifications (arrows); B, Resected spleen specimen showing calcifications (arrows); C, Culture of tissue from the resected spleen.
The most common symptoms of brucellosis are fever, malaise, and arthralgias [7]. Local manifestations depend on the organ involved and may include hepatosplenomegaly, lymphadenopathy, bursitis, spondylitis, epididymo-orchitis, meningitis, or endocarditis. Diagnosis involves obtaining a detailed history, with particular emphasis on exposure and occupation. Imaging studies, as well as routine laboratory tests, including white blood cell count and erythrocyte sedimentation rate, may support the diagnosis but are nonspecific and often normal. Serological tests include agglutination and enzyme-linked immunosorbent assay [7]. Culture of the organism establishes a definitive diagnosis. Brucella species require special handling in the laboratory [5, 6]; physicians suspecting brucellosis should inform the laboratory about the potential diagnosis.

Treatment involves combination antibiotic therapy, typically doxycycline, for 6 weeks, along with streptomycin for the initial 2–3 weeks, or doxycycline with rifampin for 6 weeks [8]. Localized disease may require surgical management consisting of drainage or excision of abscesses, removal of infected foreign bodies, or valve replacement.

Note
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