Recurrent Epidermal Cyst Infection Caused by *Brucella melitensis* in a Diabetic Patient

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A pre sternal swelling diagnosed clinically as a sebaceous cyst in a 60-year-old diabetic patient was surgically drained, and the aspirated purulent material yielded growth of *Brucella melitensis*. The swelling recurred four times and was drained on every occasion. The patient responded to surgical excision and antibrucella treatment. The histologic diagnosis was an epidermal cyst.

Brucellosis continues to be an important infectious disease problem in Kuwait. There has been an escalation of human brucellosis cases in the past few years, with the incidence reported as 68.9/100,000 population in 1985 compared with 1.15/100,000 in 1976 (1).

Diagnosis of brucellosis in humans poses a great challenge to physicians, especially in countries where the disease is rare. Since it is one of the most often encountered conditions in this part of the world, varied presentations of the disease described in the literature have been seen here. Most often the disease presents as pyrexia of unknown origin, but cases of arthritis, spondylitis, meningitis, endocarditis, etc., have been reported recently. To our knowledge, no case of soft tissue abscess caused by *Brucella* sp. has been reported from Kuwait.

**Case report.** A 60-year-old bedouin man had a painless swelling just above the sternum when he was first seen in the surgical outpatient department in August 1986. The swelling was 4 by 4 cm, soft, cystic, and nontender. It was of 3 months duration and was increasing steadily in size. Right upper cervical lymph nodes were enlarged. The patient was diabetic and was on insulin therapy. He was afebrile and did not present with any other symptoms suggestive of brucellosis. Incision and drainage of the swelling was performed, and 30 ml of thick purulent material was aspirated and sent to the laboratory for routine culture. A portion of the aspirated material was sent for culture for mycobacteria. A Ziehl-Neelsen stain of the smear was negative for acid-fast bacilli, and the culture was reported to be negative for mycobacteria after 6 weeks of incubation. Gram-positive cocci were seen in the Gram-stained smear, and on culture *Staphylococcus aureus* was grown. Treatment with cloxacillin was started, and the wound healed without any complications.

In February 1987, the patient once again presented in the surgical outpatient clinic with painful swelling of 1-month duration above the sternum. Incision and drainage was repeated, and pus was sent for routine and mycobacterial cultures. After 48 h, a blood agar plate (incubated aerobically) and a chocolate agar plate (incubated in a CO2 atmosphere) yielded growth of a nonmotile, gram-negative, catalase- and oxidase-positive coccobacillus. Growth was absent on MacConkey agar. A smear and culture for acid-fast bacilli were again negative. Suspicion of the isolate being *Brucella* sp. prompted us to do tests for urease and hydrogen sulfide (H2S) production, as well as thionine (1:50,000) and basic fuchsin (1:50,000) inhibition tests. At the same time, an API 20E strip (API System S.A., Montalieu-Vercieu, France) was inoculated to identify any other fermentative or nonfermentative, oxidase-positive gram-negative bacilli. The isolate was presumptively identified as *Brucella* sp. by the conventional tests (it was urease positive and H2S negative, CO2 was not required for growth, and growth was positive in the presence of thionine and basic fuchsin) and by the API strip (profile index number 0010004-10). Identification was confirmed by performing a slide agglutination test with *B. abortus* and *B. melitensis* antisera (Wellcome Diagnostics, Beckenham, England). Antibiotic susceptibility testing was performed by disk diffusion, and MICs were determined by using conventional broth macrodilution methods. Serial twofold dilutions of the antimicrobial agents were prepared in Trypticase soy broth (Scott Laboratories, Inc., Fiskeville, R.I.) and inoculated with an overnight broth culture of the isolate diluted to give a final concentration of 5 x 104 to 1 x 106 organisms per ml. The tubes were inoculated at 37°C aerobically for 48 h. The lowest concentration of antimicrobial agent which did not give visible turbidity was considered the endpoint. The isolate was found to be susceptible to tetracycline (MIC, 0.06 μg/ml), streptomycin (MIC, 1.0 μg/ml), rifampin (MIC, 0.25 μg/ml), gentamicin (MIC, 0.25 μg/ml), amikacin (MIC, 2.0 μg/ml), tobramycin (MIC, 0.5 μg/ml), cefuroxime (MIC, 0.5 μg/ml), cefotaxime (MIC, 0.5 μg/ml), and cefoxitin (MIC, 0.5 μg/ml) but resistant to sulfamethoxazole-trimethoprim (MIC, 38/2 μg/ml; MBC, 152/8 μg/ml). Treatment with tetracycline (3 g/day) and streptomycin (1 g/day) was started. Two weeks later, the patient came back with the swelling. Aspirated pus was cultured again, but inadvertently the technician released the report as "No growth after 48 h of incubation." Another pus sample cultured 2 weeks later yielded growth of *B. melitensis*. Besides culturing the pus on solid media, a portion of the material was inoculated in Trypticase soy broth and treated like a blood culture. Subculture of the broth onto solid media on day 5 of incubation grew *B. melitensis* on blood agar and chocolate agar. The patient continued to receive antibrucella treatment, but the swelling reappeared a week later. Hematological studies revealed a leukocyte count of 8.0 x 109/liter, hemoglobin of 169 g/liter, and sedimentation rate of 12 mm/h. A tomogram of the chest was normal. There was no involvement of the sternum. One month after the isolation of the organism, titers of *Brucella* antibodies were determined.
by a microagglutination test (MAT) and indirect immunofluorescence test (IIF) (BioMérieux, Charbonnières Les Bains, France). The MAT was performed by the technique of Bettelheim et al. (2) with *B. abortus* 99 (BioMérieux). Titers were as follows: MAT, 1:160; IIF immunoglobulin G, 1:2,560; and IIF immunoglobulin M, 1:80. The MAT was repeated on a second serum sample collected 2 weeks later, and the titer was found to be 1:640. Since repeated aspirations had failed, excision of the cyst was performed. The histologic examination suggested a benign, keratinous cyst of epidermal origin. The patient was discharged after 5 days in the hospital and remains free of symptoms.

**Discussion.** Cutaneous lesions are a rare occurrence in human brucellosis (15). Hughes (8) in 1897 reported subcutaneous papules as a clinical manifestation in brucellosis. Although Simpson (12) found skin lesions in 11% of 103 patients, Spink (13) described them in only 2% in his study. In the United States in 1975, only 1.5% of patients with brucellosis were found to have dermatologic lesions (5). Solitary cutaneous abscess caused by *Brucella* sp. remains a rare entity, with only few cases reported in the literature. In two reports from the United States, where the annual incidence is only 0.07 cases per 100,000 population, *B. suis* was grown from the pus of a patient with suppurative lymphadenitis (11) and in another instance was grown from the pus aspirated from a gallbladder (10). Incidentally, both these patients were laboratory technologists. Buchanan et al. (3) found only one patient with a soft tissue abscess, related to a penetrating injury, in a series of patients with abattoir-associated brucellosis. A case of soft tissue abscesses around the knee caused by *B. suis*, which developed subsequent to soilage of skin abrasions with blood of a killed deer, was reported by Christianson et al. (6). Our patient belonged to the bedouin class and lived in the desert. Drinking raw milk from their livestock, especially goats and camels, is a popular social custom among bedouins. Patients with brucellosis usually present with systemic infections with or without any localizing symptoms. In the absence of a history of penetrating injury and symptoms of systemic infection, diagnosis of a local abscess caused by *Brucella* sp. was a difficult proposition in our patient. It has been suggested that cutaneous lesions may occur by local inoculation of organisms from skin, as an extension of organisms from underlying lymph nodes or bone, and perhaps as a result of immunologic reactions in patients with high titers of *Brucella* antibodies (15). Huddleston (7) attributed skin lesions occurring on the hands and forearms of veterinarians after they handled placentas from aborting cows to hypersensitivity reactions to *Brucella* antigens. In our patient, the underlying bone (sternum) was not involved in the lesion and direct inoculation of the skin seemed unlikely.

Human brucellosis has been arbitrarily classified into five clinical forms, namely (i) subclinical, (ii) bacteremic, (iii) serologic, (iv) localized, and (v) chronic. Localized brucellosis refers to cases in which organisms are not isolated from blood but are localized in specific tissues, such as joints, bones, liver, spleen, central nervous system, or skin (9). Localization may result as a complication of bacteremic infection or may be the only manifestation of chronic infection. In some cases of localized brucellosis, the serologic evidence may be lacking and a diagnosis is possible only by culture of a biopsy specimen from the involved organ (14). Blood was not cultured on any occasion from our patient, because on his first visit to the hospital his symptoms and signs did not warrant a blood culture or serologic investigations for brucellosis. Subsequent to isolation of *B. melitensis* from the abscess, the patient received antibiotics, and a blood culture at that time was considered useless. However, serologic tests (MAT and IIF) were done and there was evidence of acute infection, as demonstrated by the fourfold rise in MAT titer. A high immunoglobulin G titer of 1:2,560 might indicate a past infection which got reactivated.

Since *Brucella* sp. is a slowly growing, fastidious microorganism, the possibility is that it can be missed, as happened with us on one occasion, unless it is looked for in a sterile pus sample, especially in an endemic area such as Kuwait. Considering the fastidiousness and the slow growth of this organism, comprehensive culture procedures are necessary to recover a wide range of common and unusual pathogenic organisms. In the absence of adequate treatment, recurrence of abscesses is known. Carpenter et al. (4) reported a patient with multiple sterile abscesses requiring surgical drainage over an 8-year period. In the case reported by Nadler et al. (11), treatment with tetracycline and surgical drainage was not found to be successful, but treatment with tetracycline plus streptomycin resulted in a cure. With our patient, excision of the epidermal cyst became necessary, because repeated aspirations and combined treatment with tetracycline and streptomycin failed.

**LITERATURE CITED**