**ANSWER TO PHOTO QUIZ**

Philip A. Mackowiak, Section Editor

---

**A Young Man from Nantucket**

*(See pages 1139–40 for Photo Quiz)*

Figure 1. Lesions on the hand and wrist due to ulceroglandular tularemia with nodular lymphangitis

**Diagnosis:** Ulceroglandular tularemia. Initial serological test results were positive for *Francisella tularensis* antibodies, at a titer of 1:640, 4 weeks after the onset of symptoms. This titer increased to 1:16,384 at 8 weeks, a value greater than that of the positive control used by the Massachusetts State Laboratory. He declined admission to the hospital for receipt of intravenous streptomycin therapy, but his symptoms and lesions (figures 1 and 2) resolved during a 4-week course of oral ciprofloxacin.

*F. tularensis* is a fastidious gram-negative coccobacillus that grows best on supplemented media, such as cysteine-glucose blood agar. It does not grow on routine sheep blood agar but may be recovered on chocolate agar, which may lead to a misidentification as *Haemophilus* species, as in this case. *F. tularensis* is a highly virulent pathogen, a laboratory hazard, and a fearsome potential agent of bioterrorism. When tularemia is suspected, the clinician should promptly contact the microbiology laboratory to ensure that specimens are handled with appropriate precautions [1]. Luckily, no laboratory transmission of tularemia occurred in this case. Most cases of tularemia in the United States were acquired as a result of hunting, trapping, skinning, or butchering animals [3, 4]. Most cases now result from tick and deer fly bites [5]. Aerosols generated by lawn mowing and brush cutting were implicated in a recent outbreak of pneumonic tularemia on Martha’s Vineyard, Massachusetts [6]. Viable *F. tularensis* may persist in water, soil, vegetation, and peltry for weeks [4, 6]. This patient may have been infected by the introduction of a soil inoculum into his hands, which were customarily abraded from manual labor. As few as 10 organisms injected subcutaneously can cause human infection [7].

Tularemia typically presents with a cutaneous ulcer and local lymphadenopathy (ulceroglandular tularemia). As seen here, ulceroglandular tularemia may develop a “sporotrichoid” appearance with nodular lymphangitis in as many as 27% of cases [3], although nodular lymphangitis has not been observed in some large series [8]. Tularemia may also present with glandular (lymphadenopathy without skin lesions), pneumonic, typhoidal (fever without focal complaints), oculoglandular, and pharyngeal syndromes. Pneumonic and typhoidal forms are associated with the highest mortality rates, but overall mortality...
rates are low if appropriate antibiotic therapy is administered [8, 9].

The differential diagnosis of nodular lymphangitis includes infection with Mycobacterium marinum, sporotrichosis, and, less commonly, nocardiosis and cutaneous leishmaniasis. In this case, regional lymphadenopathy, a systemic febrile illness, and travel to Nantucket Island strongly suggested the diagnosis of tularemia. M. marinum and sporotrichosis are rarely associated with fever and lymphadenopathy [10]. Tularemia has been endemic in Massachusetts on Martha’s Vineyard and Nantucket Island since the introduction of cottontail rabbits from Arkansas and Missouri by hunting enthusiasts in the 1930s [6].

The traditional drug of choice for treating tularemia is streptomycin [11]. There are increasing data to support the use of fluoroquinolones, which are bactericidal for Francisella species and achieve high concentrations in the intracellular space, where F. tularensis is usually found [12, 13]. During an epidemic of tularemia in Spain, ciprofloxacin therapy was associated with higher success rates than either streptomycin or doxycycline therapy [9]. Relapse rates associated with ceftriaxone and tetracycline therapy are unacceptably high [8, 11, 14].

John J. Ross
Division of Infectious Diseases, Caritas Saint Elizabeth’s Medical Center, Boston, Massachusetts

References


