Answer to Photo Quiz: Echinococcosis/Hydatid Disease

(See page 2845 in this issue [doi:10.1128/JCM.00645-12] for photo quiz case presentation)

This was a case of cystic echinococcosis, also known as hydatid disease. This disease is caused by *Echinococcus granulosus*. The genus *Echinococcus* comprises small tapeworms with larval (metacestode) stages known as hydatids. Dogs are the definitive host for *E. granulosus*, and sheep, cattle, goats, and pigs are intermediate hosts. Humans are infected by ingesting echinococcal eggs excreted in dog feces. Eggs hatch and release oncospheres which penetrate the intestinal wall and migrate through the circulatory system into various organs, notably the liver and lungs (4; http://dpd.cdc.gov/dpdx/html/ImageLibrary/Echinococcosis_il.htm).

This patient had an 8-year history of right upper quadrant (RUQ) abdominal pain. Her three previous surgeries were for removal of hydatid cysts. In addition to the large unilocular cyst causative of her current symptoms, the concurrent complex cyst and calcifications were attributed to cyst residua from her prior surgeries.

The photomicroscopic image of the calcofluor white-stained specimen demonstrates multiple echinococcal protoscolecies. Rostellar hooklets stain bright white; four examples are in the photomicrograph shown in the Photo Quiz, with the most clearly defined example on the leftmost protoscoleces. Three white-staining suckers are clearly defined on the middle protoscoleces.

Calcofluor white is a nonspecific fluorochrome dye that binds to beta 1→3 and beta 1→4 polysaccharides, present in cellulose and chitin. Calcofluor white is commonly used in clinical mycology and parasitology laboratories to detect fungi and parasites in clinical specimens (2). The bright white staining of the rostellar hooklets and, to a lesser degree, the white staining of the suckers indicate high concentrations of beta 1→3 and/or beta 1→4 polysaccharides.

Calcofluor white is not a stain commonly used for echinococcosis identification; the acquisition of these images was serendipitous simply because fluid had been submitted for fungal culture and calcofluor staining was part of the routine laboratory procedure for specimens submitted for fungal culture.

Staining and culture for acid-fast mycobacteria was also requested. We observed echinococcal rostellar hooklets to stain acid-fast with a Ziehl-Neelsen stain (not shown).

Given her history of echinococcosis, fungal and mycobacterial cultures may have been unnecessary, as her pretest probability of yet another echinococcal cyst was very high. These tests were requested because the Alameda County Medical Center is a teaching institution where evaluations for extended diagnostic differentials are often undertaken. This led to the use of stains not typically used for echinococcosis, thereby enlightening us to the staining characteristics of echinococcus with calcofluor white and Ziehl-Neelsen stains.

Initially, both *Echinococcus granulosus* and *E. multilocularis* were considered causes of the hepatic cysts. The geographic distribution of echinococcus species and her long-term residence in Yemen implicated *E. granulosus* as the causative agent (4; http://dpd.cdc.gov/dpdx/html/ImageLibrary/Echinococcosis_il.htm). The appearance of a large unilocular cyst on imaging studies was also consistent with *E. granulosus* (1, 3). We did not pursue definitive species identification, despite its availability through the CDC.

This patient recovered uneventfully from her surgery. Her pain was relieved, and she was discharged home with a 3-month course of albendazole.

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REFERENCES


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