



## Diagnostic Dilemma: A 41 year-old Man with Gastrointestinal Symptoms and an Unusual Exposure History

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## **Case Report**

A 41 year-old previously healthy man was admitted with chief complaints of nausea, vomiting, diarrhea, and headache.

The patient was well until 10 days before admission when nausea, diarrhea, and headache developed suddenly. He experienced 1-3 episodes of emesis without solid components, blood, or bile staining and numerous loose but not watery stools per day. He denied melena, hematochezia, and mucus in the stool. He also reported fevers up to 102.3o F. and a 15-pound weight loss over 10 days. Two days prior to admission he received ciprofloxacin and metronidazole from his primary care provider for presumed community-acquired bacterial gastroenteritis without resolution of symptoms. Because of continued symptoms, he was evaluated in an Emergency Room at an outside hospital and transferred to this hospital.

He had a past medical history significant for hypertension and depression. His social history was remarkable for occupational exposure to domestic and exotic livestock (cheetahs, monkeys, zebras, and birds) through his job at a sale barn for several weeks prior to admission. In addition, he had been exposed to bovine placenta through birthing calves at his farm. He denied sick contacts, tick bites, and environmental exposure to chemicals.

On arrival, physical exam was remarkable for tachycardia without postural changes in blood pressure, good perfusion, and decreased breath sounds at the right lung base. Laboratory studies were remarkable for leukocytosis (WBC 10,400/mm<sup>3</sup> with 84.4% granulocytes) and mild transaminitis (AST 67 U/L, alkaline phosphatase 140 U/L). A chest x-ray revealed right lower lobe consolidation and a chest CT scan revealed right lower lobe pneumonia with associated mediastinal lymphadenopathy. A 2 liter normal saline bolus was administered, and he was started on ondansetron for nausea. Diagnostic testing was ordered.

## **Discussion**

This 41 year-old previously healthy patient presented with symptoms of gastroenteritis and headache and was subsequently found to have a lobar pneumonia, fever, and transaminitis. His occupational exposure to exotic animals and products of bovine conception suggested an uncommon cause of his symptoms.

Q fever, caused by the intracellular bacterium *Coxiella burnetii*, can result in fever, atypical pneumonia, night sweats, and hepatitis and is associated with contact (most commonly via aerosolization and inhalation) with products of conception from infected cattle, sheep, and goats (placenta, reproductive fluids). Other modes of transmission include tick bites, consumption of unpasteurized milk products from infected animals, and, rarely, person-to-person transmission. One hundred thirty one cases of Q fever were reported in the United States in 2010. In Missouri, the annual reported incidence was 0.4-1.0 cases per million (CDC data). Q fever is a diagnosis of particular interest due to its potential use as a weapon of bioterrorism related to its resistance to physical stress and ability to aerosolize and travel long distances (up to 10 miles in some reported cases) (1-3).

Brucellosis is another zoonotic infection associated with contact with infected products of bovine conception. Following infection by *Brucella* spp, brucellosis may cause undulating fever, constitutional symptoms, arthralgias, neuropsychiatric symptoms, gastrointestinal symptoms, cough, dyspnea, and endocarditis. The most common mode of transmission is through consumption of unpasteurized milk and milk products from infected animals. Currently, fewer than 100 cases are reported to the CDC annually, the majority from California, Florida and Texas (CDC data). Although *B. abortus* and *B. suis* species are the most common species in North America, the majority of human cases result from the bacterium *B. melitensis*, which has the highest pathogenicity of the species and whose typical reservoir is sheep (4).

Although the patient denied tick exposure, his occupational exposure to domestic and exotic livestock and living arrangements on a farm place him at higher risk for tick-borne illnesses such as ehrlichiosis. Symptoms of ehrlichiosis may include headaches, myalgias, fatigue, nausea, and in rare cases a macular, maculopapular, or petechial rash on the trunk, legs, arms, and face. If left untreated, late infection may result in a toxic shock-like syndrome, likely due to up-regulation of TNF-alpha (5-6).

Based on the patient's exposure history, psittacosis was also considered. Infection with the bacterium *Chlamydia psittaci* in humans often results from inhalation of aerosolized feces or contact with respiratory secretions of infected birds. Clinical manifestations of acute infection include flu-like symptoms, productive cough, and hemoptysis. However, gastrointestinal symptoms and transaminitis are not typically a prominent feature of infection with *C. psittaci* (7).

With the acute onset of symptoms and transaminitis, we considered viral hepatitis as well as community-acquired infection with *Clostridium difficile*, although *C. difficile* would not account for his respiratory symptoms. In addition, antibiotic therapy with metronidazole from his primary care provider would likely have treated infection with *C. difficile*. Finally, other common causes of atypical pneumonia and gastroenteritis were considered, including Legionnaire's disease, giardiasis, cryptosporidiosis, and histoplasmosis.

Finally, the patient had a history of psychiatric illness, so self-induced illness was considered. However, the patient's depressive symptoms were well-controlled, and he had no prior suicide attempts. In addition, a self-induced illness would likely not account for the combination of gastrointestinal and respiratory symptoms, making self-induced sequelae of his psychiatric illness less likely.

## Case Report, continued

Results of diagnostic laboratory testing are as follows:

Comprehensive Urine Drug Screen	Negative
Hepatitis B surface Ag	Nonreactive
Hepatitis B core Ab IgM	Nonreactive
Hepatitis C Ab by EIA	Nonreactive
Hepatitis A Ab IgM	Nonreactive
Urine Histoplasma Ag	Negative
C. burnetii Phase I IgG	<1:16
C. burnetii Phase II IgG	(H) 1:16
Brucella Ab	<1:20
Ehrlichia IgG	<1:64
Ehrlichia IgM	<1:16
C. psittaci IgG	1:256
C. psittaci IgM	<1:10
C. difficile PCR	Negative
Cryptosporidium	Negative
Giardia Ag by EIA	Negative
Stool ova and parasites	Negative

The patient experienced prompt resolution of his gastrointestinal symptoms and pneumonia following antibiotic therapy with azithromycin and doxycycline. He was discharged on hospital day 3 with azithromycin and doxycycline. He was asymptomatic one week after discharge.

## Conclusion

We report the case of a 41 year-old previously healthy man with nausea, vomiting, and diarrhea who was subsequently found to have fever, lobar pneumonia, transaminitis, and an unusual exposure history. Although serological testing was equivocal, the patient's clinical presentation, response to antibiotic therapy, and exposure history are consistent with the diagnosis of Q fever. This case provides an example of diagnosis based on integration of clinical presentation, history, and response to therapy when laboratory testing may be equivocal. In the case of this patient with an unusual exposure history, the medical team's final diagnosis was based on his clinical presentation, exposure history, serologic testing, and response to therapy. Careful history,

physical examination, and clinical course remain the principal components of differential diagnosis complemented by additional laboratory testing.

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## Editorial: Impact of Academic Hospitalists on American Medical Education: A Compact Review

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## Introduction