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TITLE: Q fever presenting as miliary pneumonia: case imagery and differential diagnosis

Running title: Q fever presenting as miliary pneumonia

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KEY-WORDS

Pneumonia, Computed Tomography (CT), Occupational exposure

TWITTER SUMMARY

Interesting case/imagery by @simcouillard: 56♂, immunocompetent, consulted for one month of relapsing fever, dyspnea, non-productive cough, headaches, and myalgias. PMHx unremarkable except for exposure to dead animals. CT scan: innumerable 1-3mm micronodules. Bronchoalveolar lavage: inconclusive. Diff. diagnosis?

ABBREVIATIONS

BAL: bronchoalveolar lavage

ABSTRACT

CASE/IMAGERY DESCRIPTION: A 56-year-old immunocompetent male consulted for one month of relapsing fever, moderate dyspnea, non-productive cough, headaches, and myalgias. Past medical history was unremarkable except for exposure to a variety of livestock carcasses. A computed tomographic scan revealed innumerable randomly distributed 1-3mm micronodules. Initial diagnostic workup including bronchoalveolar lavage (BAL) was inconclusive.

STUDY QUESTIONS: Is this miliary pneumonia? What diagnosis must initially be considered? In this specific case with negative BAL analysis/cultures, what would your differential diagnosis be? Is Q fever a possibility?

CASE/IMAGERY PRESENTATION

A 56-year-old immunocompetent male consulted for one month of relapsing fever, dyspnea, non-productive cough, headaches, and myalgias. Physical examination was noncontributory. This gentleman's occupation as a renderer involved manipulation of a variety of livestock carcasses. The chest X-ray showed subtle micronodular opacities. A computed tomographic scan revealed innumerable randomly distributed 1-3mm micronodules compatible with miliary pneumonia (Figure 1).

Diagnostic workup including bronchoalveolar lavage was inconclusive. Because of the patient's occupation, serologic two-phase testing for Q fever had been ordered. This revealed a typical fourfold increase in *Coxiella burnetii* IgG titers. His co-worker also developed serologically confirmed Q fever.

DISCUSSION

Upon admission for pneumonia of miliary pattern, we entertained numerous diagnoses. Of course, tuberculosis was our first consideration, with the patient accordingly isolated. Nevertheless, the differential diagnosis of miliary pneumonia is vast (Table 1).[1] To our knowledge, Q Fever has never been tomographically described as causing miliary opacities.

Q fever is a zoonosis caused by *C. burnetii*. Humans are infected through exposure to bacteria transmitted by the feces, urine, milk and/or birth products of infected animals. Outbreaks of the disease can occur.[2]

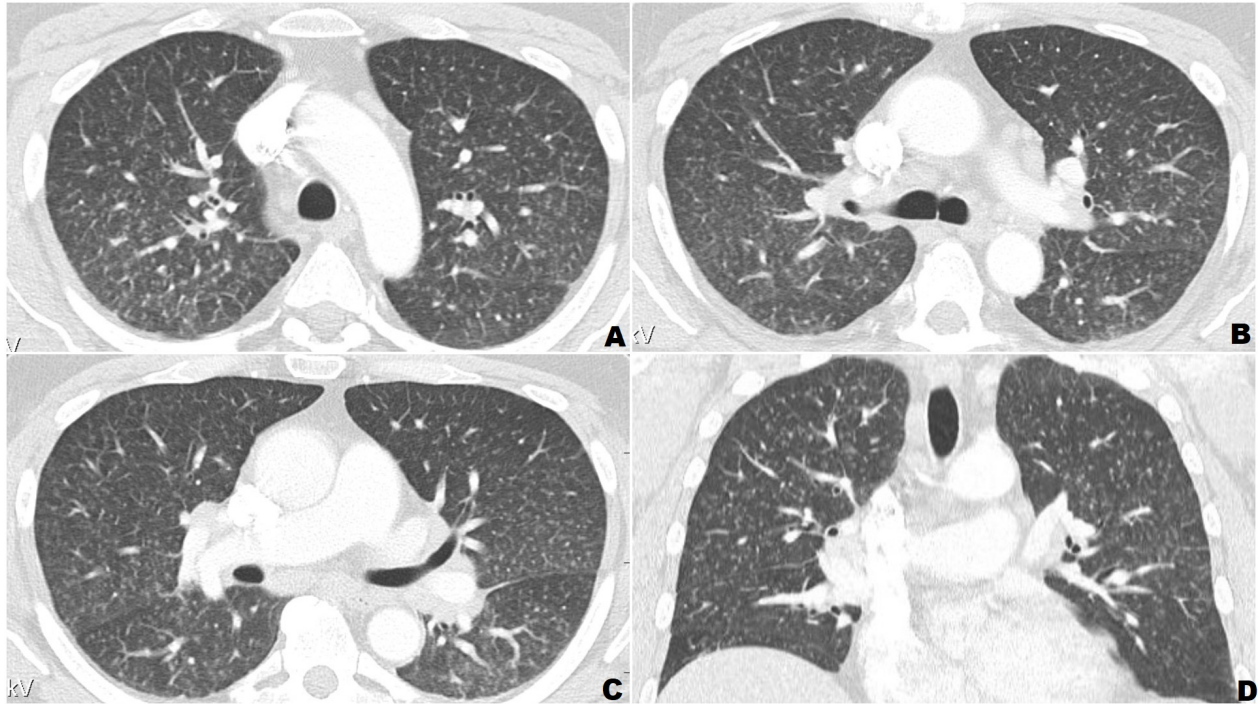
Diagnosis of Q fever is challenging. Symptoms and signs range from none – approximately 60% of acutely infected patients are asymptomatic – to mild flu-like symptoms evolving in pneumonia and hepatitis. Pneumonia often combines an atypical pneumonic picture with extrapulmonary findings such as headaches, myalgias, arthralgias, hepatitis, gastrointestinal malaise, and relative bradycardia.[2] Though radiographic presentation is diverse (Table 2), focal or multifocal alveolar consolidation is the most frequent presentation.[2,3] Diagnosis is based on a fourfold increase in the IgG antibody titer between acute and convalescent serum samples. A two-week doxycycline regimen is favored when symptomatic.[2,3]

In conclusion, this first tomographic case description of Q fever presenting as military pneumonia serves to highlight the differential diagnosis of military opacities.

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Figure 1.



Chest computed tomographic scan at admission for atypical pneumonia showing miliary pneumonia with apical predominance. History and physical examination of this immunocompetent 56 year-old male was unremarkable except for an atypical pneumonic clinical presentation and his occupational exposure to a variety of livestock carcasses.

TABLE 1 – Differential diagnosis of miliary pneumonia

Infectious		
Mycobacterial	Viral	Typical or atypical bacteria
<i>Mycobacterium tuberculosis</i> *	<i>Varicella zoster</i> *	<i>Staphylococcus aureus</i>
Atypical mycobacteria	<i>Cytomegalovirus</i>	<i>Haemophilus influenzae</i>
Mycotic*	<i>Influenza</i>	<i>Salmonella</i>
<i>Histoplasmosis</i>	<i>Measles</i>	<i>Legionella</i>
<i>Blastomycosis</i>		<i>Psittacosis</i>
<i>Coccidiomycosis</i>		<i>Chlamydia pneumoniae</i>
<i>Paracoccidiomycosis</i>		<i>Bartonellosis</i>
<i>Cryptococcus</i>		<i>Brucellosis</i>
Rickettsial	Parasitic	<i>Melioidosis</i>
Q Fever	<i>Schistosomiasis</i>	<i>Nocardiosis</i>
(<i>Coxiella burnetti</i>)	<i>Strongyloidiasis</i>	<i>Tularemia</i>
	<i>Toxoplasmosis</i>	
Neoplastic (metastases)*	Environmental	Inflammatory
Renal cell carcinoma	Hypersensitivity pneumonitis*	Sarcoidosis
Thyroid carcinoma	Silicosis	Amyloidosis
Lymphoproliferative disorder	Coal worker's disease	Pulmonary hemosiderosis
Melanoma	BCGosis	Foreign-body induced vasculitis (IV drug users)
Osteosarcoma	Berylliosis	Diffuse pulmonary meningotheliomatosis
Pancreatic neoplasm		
Breast carcinoma		
Mesothelioma		
Trophoblastic disease		

*Classic causes

**TABLE 2 – Radiographic
manifestations of Q fever pneumonia**

Focal or multifocal consolidation*

Ground glass opacities

Interstitial opacities

Nodules or micronodules

Pseudotumors

Cavities

Pleural effusions

Lymphadenopathy

Miliary pneumonia

*Most frequent manifestation

