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Chronic Q-Fever (Coxiella burnetii) Causing Abdominal Aortic Aneurysm and Lumbar Osteomyelitis: A Case Report

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Coxiella burnetii is a rare cause of chronic infection that most frequently presents as endocarditis. We report a case of C. burnetii causing an infected abdominal aortic aneurysm with contiguous lumbar osteomyelitis resulting in spinal cord compromise. The diagnosis was established by serologic studies consistent with chronic Q-fever (ratio of C. burnetii immunoglobulin [Ig]G phase II titer to IgG phase I titer <1) and was confirmed by positive C. burnetii polymerase chain reaction of vertebral tissue in addition to pathology of vertebral bone showing intracellular Gram-negative coccobacillary bacteria. The patient clinically improved after surgical decompensation and prolonged treatment with doxycycline and hydroxychloroquine.

Keywords: abdominal aortic aneurysm; chronic Q-fever; Coxiella burnetii; osteomyelitis; Q-fever.

CASE REPORT

A 57-year-old Jordanian male with a past medical history of emphysema and tobacco use developed lower back pain with intermittent fevers in July 2014. A magnetic resonance image (MRI) of the lumbar spine revealed vertebral osteomyelitis at L3-L4 and incidentally detected an 8.1 cm infrarenal abdominal aortic aneurysm (AAA). He received several empiric courses of oral antibiotics with no clinical improvement. He worked as an ophthalmologic surgeon in Amman, Jordan where he was born. He had no relevant sick contacts or animal exposures but endorsed poss-...
potential bioterrorism agent [2]. No culprit exposure history was elicited in our case. Primary infection is asymptomatic in up to 60% of patients but can result in a self-limited influenza-like illness termed “acute Q-fever” [3]. Acute infection can progress to chronic Q-fever, especially in individuals who are pregnant, immunocompromised, or have underlying valvular heart disease. The most common manifestations of chronic infection are endocarditis (73% cases) and endovascular infection (8% cases), including vascular grafts and aneurysms [4]. Infection of infrarenal aortic aneurysm grafts with contiguous vertebral osteomyelitis has been described [5, 6].

A diagnosis of chronic Q-fever can be made by clinical presentation, serology, molecular testing, and tissue culture. Antigenic phase variation in the lipopolysaccharide and sugar composition of C. burnetii isolates allows for the serologic distinction of acute versus chronic disease. A ratio of C. burnetii IgG phase II to phase I titer greater >1 is consistent with acute disease, whereas a ratio <1 is consistent with chronic disease, especially when IgG phase I titer is ≥1:600 [7]. Polymerase chain reaction-based detection of C. burnetii in blood and tissue samples using a validated real-time PCR assay is invaluable for early diagnostic confirmation, as we demonstrated in this case [8]. Coxiella burnetii should be cultured in a level 3 biosafety laboratory and is technically challenging so it is not routinely performed [2, 3].

Treatment of C. burnetii endovascular infection and osteomyelitis is extrapolated from endocarditis treatment recommendations. Guidelines from the British Society of Antimicrobial Therapy recommend treatment with doxycycline in combination with either hydroxychloroquine or ciprofloxacin for a minimum of 18 months [9]. Coxiella burnetii lives in the phagolysosome of infected cells in a relatively acidic environment that reduces doxycycline bactericidal activity. The addition of hydroxychloroquine increases the pH of the phagolysosome to selectively enhance the bactericidal activity of doxycycline. Patients can be considered cured when C. burnetii IgG...
phase I antibodies decline to <1:800 and IgM/IgA phase I antibodies are <1:50 [9].

CONCLUSIONS

Coxiella burnetii endovascular infection is associated with significant morbidity and mortality and can evade clinical recognition for months before effective treatment is initiated. This case highlights the importance of early testing for C burnetii in patients with abdominal aortic aneurysm, prodromal symptoms, laboratory findings (ie, elevated inflammatory markers) suggestive of infectious etiology, and negative routine cultures.

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