

Tick-Tock Goes the Heart Block: Lyme Carditis in Disguise

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INTRODUCTION

Lyme disease, a multisystem tick-borne illness caused by *Borrelia* spirochetes, manifests in three phases: early localized, early disseminated, and late disease. Cardiac involvement, occurring during the early disseminated phase (1-2 months post-infection), is rare. Atrioventricular (AV) conduction block is the most common cardiac manifestation, though myopericarditis and, rarely, fatal pancarditis or endocarditis can occur. The exact pathophysiology remains uncertain; cardiac biopsies typically show inflammatory infiltration of perivascular and interstitial tissues. Diagnosis relies on clinical and epidemiological context, supported by positive serologic tests. This case report highlights high-degree AV block secondary to Lyme carditis.

CASE PRESENTATION

A 45-year-old male with no significant medical history was admitted after experiencing lightheadedness and notable electrocardiogram (EKG) abnormalities detected at his primary care office. He was hemodynamically stable with unremarkable lab results. Multiple EKG in the emergency department revealed high-degree AV block.

The patient reported flu-like symptoms and a diffuse blotchy rash a week prior but no characteristic bull's-eye rash. Initial Lyme disease serology from his primary care visit weeks earlier was negative. Due to clinical suspicion of Lyme carditis, intravenous ceftriaxone 2 g daily was initiated for symptomatic high-degree AV block.

On day 3, the patient experienced brief lightheadedness, and telemetry revealed 11 seconds of ventricular standstill, necessitating transfer to critical care unit. Temporary pacing was considered but ultimately deemed unnecessary due to rapid improvement. Repeat serologic testing confirmed positive Lyme IgM and negative Lyme IgG.

By day 5, a follow-up EKG showed first-degree AV block with a PR interval under 300 ms, prompting a switch to oral doxycycline for a 21-day course. Three months post-discharge, repeat EKG demonstrated resolution of the AV block.

DISCUSSION

Lyme carditis has a favorable prognosis with early recognition and treatment. AV block is typically reversible, with few instances of permanent or persistent block. Although rare fatalities occur, the overall mortality rate is low and has decreased due to early detection and treatment. Early-stage disease often presents with seronegativity.

The Suspicion in Lyme Carditis (SILC) index, a non-validated scoring system proposed by Besant et al., predicts the likelihood of Lyme carditis in endemic areas. In our case, the patient's SILC score of 9 indicated a high suspicion.

Antibiotic selection and duration are based on symptoms, PR interval, and AV block degree, with a recommended therapy duration of 21 days. Intravenous antibiotics are preferred for symptomatic AV block, first-degree AV block with a PR interval >300 ms, and high-degree AV block. Once the high-degree block resolves or the PR interval is <300 ms, patients can transition to oral antibiotics.

Suspicion index in Lyme Carditis (SILC) score	
Variables	Score
Outdoor activity/endemic area	1
Tick bite	3
Constitutional symptoms	2
Age < 50	1
Sex = male	1
Rash = erythema migrans	4
Low (0-2), Intermediate (3-6), or High (7-12) suspicion of Lyme carditis	

CONCLUSION

Early recognition and treatment of Lyme carditis yield a favorable prognosis. While serologic confirmation is ideal, treatment should not be delayed in cases with typical presentation and epidemiological factors to avert long-term complications

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