

## How Lyme myocarditis might present in an adolescent patient

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<http://danielcameronmd.com/how-lyme-myocarditis-might-present-in-an-adolescent/>

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In 2013, the Centers for Disease Control and Prevention (CDC) described [three cases of sudden deaths](#) associated with Lyme-induced myocarditis. “During November 2012 and July 2013, one woman and two men (ranging in age from 26 to 38 years) from high-incidence Lyme disease states experienced sudden cardiac death and, on postmortem examination, were found to have evidence of Lyme carditis.” [1]

In pediatric patients with Lyme myocarditis, the most common presenting symptoms include respiratory and gastrointestinal distress, with or without chest pain.

In this week’s journal of *Pediatric Emergency Care*, researchers offer insight into how Lyme myocarditis might present in a patient as they describe the case of a previously healthy adolescent diagnosed with the disease. [2] The patient lived in a Lyme-endemic region but did not recall a tick bite.

A 15-year-old African-American girl was hospitalized after a three-day history of intermittent retrosternal and epigastric pain. The pain was described as “gnawing” and “twisting” without radiation in the sternal and right upper quadrant area. The pain was 9 on a 1 to 10 scale. There was no evidence of costochondritis.

Cholecystitis was considered. She presented with mild abnormal elevations of her liver function tests, focal dilation of the common bile duct, gallbladder thickening by ultrasound, and a positive Murphy sign. (Murphy’s sign is a test for gallbladder disease in which the patient is asked to inhale while the examiner’s fingers are pressed under the right rib cage. If the patient stops breathing or is in pain as the patient breaths out, the gallbladder is inflamed.) The pediatric surgeon concluded the exam was consistent with cholelithiasis but not acute cholecystitis.

The patient was hospitalized with a presumptive diagnosis of myocarditis. Her initial electrocardiography (EKG) “indicated normal sinus rhythm but revealed low voltages throughout all leads, widened QRS complex, right axis deviation, and nonspecific intraventricular conduction block.” Fische also noted that the “Troponin-I was markedly elevated at 15.81 ng/mL indicating myocardial injury (hospital laboratory criterion for acute myocardial infarction >0.3 ng/mL).” Additionally, “A bedside echocardiogram revealed moderately diminished left ventricular systolic shortening (ejection fraction, 37% – 40%) and a trivial pericardial effusion.”

Lyme disease was considered on the first day during empiric treatment with 1 g/kg intravenous immune

globulin (IVIG). She developed second-degree atrioventricular block (Mobitz type 2) and hypotension.

Lyme disease tests were ordered, and she was empirically started on doxycycline. She was treated with milrinone infusion for afterload reduction and intravenous furosemide for pulmonary edema. Her EKG changed to first-degree heart block by day 2 and resolved completely on hospital day 3. The authors noted that a Cochrane review found insufficient evidence to support IVIG use in acute myocarditis.

Her Lyme disease was subsequently confirmed with serologic tests. Lyme enzyme-linked immunosorbent assay (ELISA) and immunoglobulin M (IgM) of 0.87 (reference range, 0.00 – 0.79) were positive.

The patient recovered and was discharged home on hospital day 7 on oral furosemide, enalapril, and doxycycline, according to Fishe and colleagues.

“It is important to explain all results that are found as part of the diagnostic work-up,” the authors conclude. Furthermore, “In patients with Lyme disease who complain of cardiopulmonary symptoms, clinicians should have a low threshold for obtaining an EKG to evaluate for Lyme carditis.” [2] And, note that in “children and adolescents, respiratory and gastrointestinal complaints, *with or without chest pain*, are the most frequent presenting symptoms.”

The case of a young man who died from undiagnosed Lyme carditis is discussed in another All Things Lyme blog, [Relying on a Negative Lyme Disease Test Can Prove Deadly](#).

## References

1. Centers for Disease C, Prevention. Three sudden cardiac deaths associated with Lyme carditis – United States, November 2012-July 2013. *MMWR Morb Mortal Wkly Rep*, 62(49), 993-996 (2013).
2. Fishe JN, Marchese RF, Callahan JM. Lyme Myocarditis Presenting as Chest Pain in an Adolescent Girl. *Pediatr Emerg Care*, (2016).

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