

CASE REPORT



Lyme disease presenting with facial palsy and myocarditis mimicking myocardial infarction

Julieta Gilson^a, Koroush Khalighi^{a,b}, Farhad Elmi^{a,b}, Mahesh Krishnamurthy^a, Amirsina Talebian^b and Rubinder S. Toor^{b,c}

^aDepartment of Internal Medicine, Easton Hospital, Drexel University, Easton, PA, USA; ^bDepartment of Cardiology, Easton Cardiovascular Associates, Easton, PA, USA; ^cDepartment of MPH@GW, George Washington University, Milken Institute School of Public Health, Washington, D.C., USA

ABSTRACT

A 45-year-old woman presented with a sudden episode of typical chest pain, radiating to her neck. The patient denied premature coronary artery disease in the family. Initial EKG showed normal sinus rhythm with a 1 mm ST-elevation involving lead II and lead aVF and a 1 mm ST-depression in lead V1 with associated T-wave inversion. Initial Troponin I (normal <0.4 ng/mL) and CK-MB (normal <7.7 ng/mL) were elevated at 7.82 ng/mL and 55.2 ng/mL, respectively. Six hours later, Troponin I increased to 13.44 ng/mL and CK-MB to 75.7 ng/mL. The patient underwent cardiac catheterization which did not show any significant obstructive coronary artery disease. Two days later the patient developed right-sided facial palsy. Diagnosis of Lyme disease was confirmed by ELISA with positive IgM and IgG antibodies. Treatment with intravenous ceftriaxone and oral steroids was started. Eventually resolution of symptoms and, normalization of cardiac markers and EKG changes, were achieved. This is a rare case of Lyme myocarditis associated with markedly elevated Troponin I, normal left ventricle function, and an absence of conduction abnormalities. To the best of our knowledge, Lyme myocarditis mimicking acute coronary syndrome with such high levels of Troponin I and neurologic compromise has not been previously described. Lyme myocarditis may be a challenging diagnosis in endemic areas especially in patients with coronary artery disease risk factors, presenting with typical chest pain, EKG changes and positive cardiac biomarkers. Therefore, it should be considered a differential diagnosis in patients presenting with clinical symptoms suggestive of acute coronary syndrome.

Abbreviations AV: Atrioventricular; CK-MB: Creatinine Kinase-MB; EKG: Electrocardiogram; ELISA: Enzyme-Linked Immunosorbent Assay; IgG: Immunoglobulin G; IgM: Immunoglobulin M

ARTICLE HISTORY

Received 17 August 2017
Accepted 17 October 2017

KEYWORDS

Lyme disease; lyme myocarditis; acute coronary syndrome; tick; Bell's Palsy; Troponin I; CK-MB; EKG; chest pain; atrioventricular block

1. Introduction

Lyme disease is the most common vector-borne disease in the USA which involves multiple systems of the body [1]. Lyme carditis is a rare manifestation, occurring in 1.5%–10% of cases in North America and 0.5%–4% in Europe [2]. Whereas there is no sex predisposition for Lyme disease, Lyme carditis has been reported to have a 3:1 male: female ratio [3]. Cardiac involvement presents with fluctuating degrees of AV block and, rarely, myocarditis, with or without pericardial involvement [4]. Myocardial and pericardial involvement can occur, but generally is mild and self-limited. Lyme carditis can present with chest pain, palpitations, syncope, and dyspnea [5]. Third degree AV block has been present in 49% of patients with Lyme carditis. First and second degree heart block are present in 12% and 16% of patients, respectively [3]. *B. burgdorferi* has also been isolated from the myocardium [6]; this could explain why Lyme disease associated myocarditis may present with cardiac manifestations such as episodes of non-sustained

ventricular tachycardia, ST segment depression, reversible depression of left ventricular function and congestive heart failure [2].

We present a case of a woman, who presented with acute coronary syndrome followed by an episode of Bell's palsy.

2. Case

A 45-year-old woman, living in Northeastern Pennsylvania, presented to the emergency department with a sudden episode of typical left-sided chest pain radiating to her neck. The pain was described as a pressure sensation being 9/10 in intensity and accompanied by diaphoresis. Two days before, the patient had an intermittent headache attributed to sinus infection for which she took amoxicillin. She did not recall a tick bite or a skin rash. The patient had been previously diagnosed with hyperlipidemia, but denied family history of premature coronary artery disease. She was not a smoker.

Upon admission, the patient was given nitroglycerin with relief of her chest pain. Initial EKG showed normal sinus rhythm with 1 mm concave ST-elevation involving lead II and lead aVF and a 1 mm ST-depression in lead V1 with associated T-wave inversion (Figure 1). A second EKG performed one hour later, did not show any further ST-T changes. She did not have any evidence of cardiac dysrhythmias during her stay in the emergency room. Initial Troponin I (normal <0.4 ng/mL) and CK-MB (normal <7.7 ng/mL) were elevated at 7.82 ng/mL and 55.2 ng/mL, respectively [7,8]. Six hours later, Troponin I increased to 13.44 ng/mL and CK-MB to 75.7 ng/mL. Subsequent cardiac catheterization did not show any significant obstructive coronary artery disease. Echocardiogram did not reveal any pericardial effusion and showed a left ventricular ejection fraction of 55%.

Two days later, the patient developed right-sided facial palsy. Given this new symptom in an endemic area [9], Lyme disease was considered. The diagnosis of Lyme disease was confirmed by ELISA with positive IgM and IgG antibodies. Treatment with intravenous ceftriaxone and oral steroids was started. Eventually resolution

of symptoms and, normalization of cardiac markers and EKG changes, were achieved (Figure 2).

3. Limitations

This is an interesting case of Lyme myocarditis with subsequent neurological involvement, associated with elevated Troponin I with normal left ventricular function and no significant coronary artery disease. Although cardiac symptoms were relieved by treatment for Lyme disease, this may not necessarily imply a cause-effect relationship. More similar cases may need to be documented to support a causal association between Lyme disease and acute coronary syndrome.

4. Discussion

This is a rare case of Lyme myocarditis associated with markedly elevated Troponin I and normal left ventricle function, without conduction abnormalities. Higher levels of Troponin I related to Lyme myocarditis have been previously reported in the literature[10]. However, the lack of conduction abnormalities is uncommon

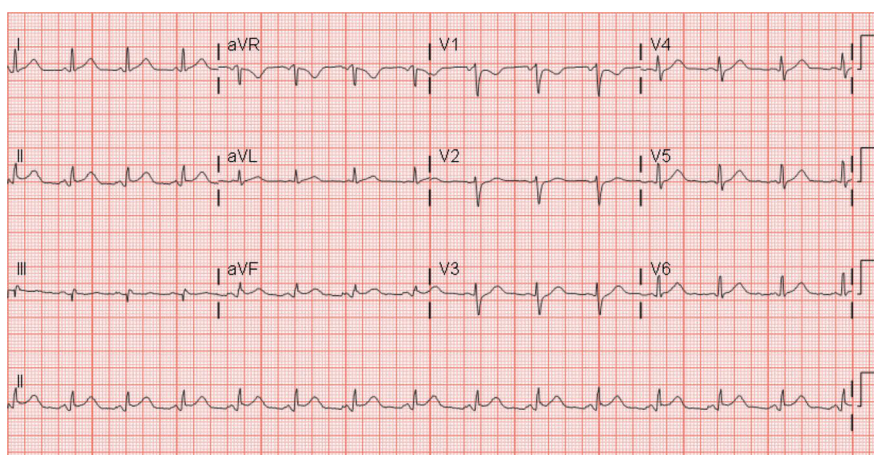


Figure 1. EKG at time of presentation.

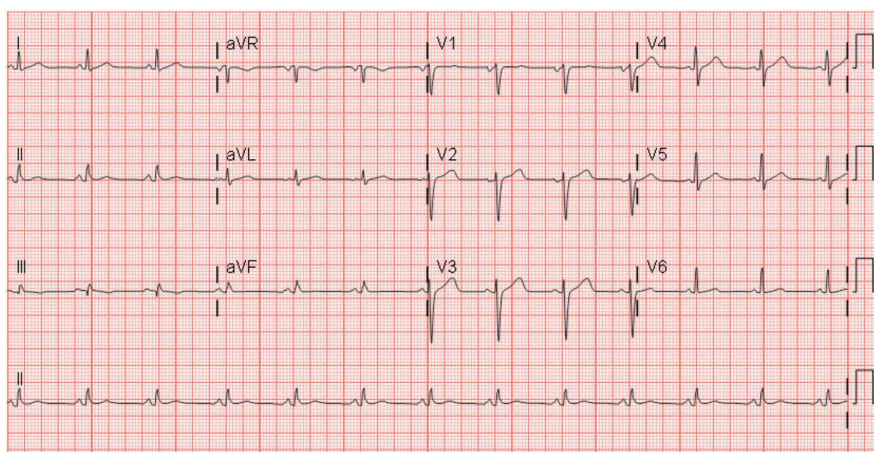


Figure 2. EKG after treatment with Ceftriaxone.

given that approximately 49% of patients report third-degree AV block [3].

There has been a case of Lyme myocarditis, without conduction abnormalities, that initially presented with left-sided chest pain, elevated cardiac biomarkers, and EKG findings consistent with myocardial infarction. However, that particular case had a positive history for symptoms associated with the initial stages of Lyme disease, including erythema migrans weeks prior to evaluation, and lacked development of neurological complications [7].

To the best of our knowledge myocarditis, without conduction abnormalities, mimicking acute coronary syndrome with such high levels of Troponin I and neurologic compromise has not been previously described. In retrospect, the diagnosis could have been suggested with the presence of prodromal symptoms and involvement of more than one system before confirmation by serology. Prognosis seems to be favorable with adequate therapy, although late complications such as dilated cardiomyopathy may occur [11].

5. Conclusion

Lyme myocarditis may be a challenging diagnosis in endemic areas especially in patients with coronary artery disease risk factors who present with typical chest pain, EKG changes and positive cardiac biomarkers. Therefore, it should be considered a differential diagnosis in patients presenting with clinical symptoms suggestive of acute coronary syndrome.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

- [1] Marques AR. Lyme disease: a review. *Curr Allergy Asthma Rep.* 2010;10(1):13–20.
- [2] Lelovas P, Dontas I, Bassiakou E, et al. Cardiac implications of Lyme disease, diagnosis and therapeutic approach. *Int J Cardiol.* 2008;129(1):15–21.
- [3] van der Linde MR. Lyme carditis: clinical characteristics of 105 cases. *Scand J Infect Dis Suppl.* 1991;77:81–84.
- [4] Lamaison D. Cardiac involvement in Lyme disease. *Med Mal Infect.* 2007;37(7–8):511–517.
- [5] Pinto DS. Cardiac manifestations of Lyme disease. *Med Clin North Am.* 2002;86(2):285–296.
- [6] Lalosevic D, Lalosevic V, Stojic-Milosavljevic A, et al. Borrelia-like organism in heart capillaries of patient with Lyme-disease seen by electron microscopy. *Int J Cardiol.* 2010;145(3):e96–98.
- [7] Michalski B, Umpierrez de Reguero A. Lyme carditis buried beneath ST-segment elevations. *Case Rep Cardiol.* 2017;2017:1–3.
- [8] Matetzky S, Sharir T, Domingo M, et al. Elevated troponin I level on admission is associated with adverse outcome of primary angioplasty in acute myocardial infarction. *Circulation.* 2000;102(14):1611–1616.
- [9] Chomel B. Lyme disease. *Rev Sci Tech.* 2015;34(2):569–576.
- [10] Rostoff P, Gajos G, Konduracka E, et al. Lyme carditis: epidemiology, pathophysiology, and clinical features in endemic areas. *Int J Cardiol.* 2010;144(2):328–333.
- [11] Nagi KS, Joshi R, Thakur RK. Cardiac manifestations of Lyme disease: a review. *Can J Cardiol.* 1996;12(5):503–506.