

Lyme Arrhythmia in an Avid Golfer: A Diagnostic Challenge and a Therapeutic Dilemma

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Abstract

Lyme disease is a multisystem disorder affecting dermatologic, cardiac, nervous and musculoskeletal systems. Cardiac manifestations occur in about 5% of Lyme infections and stem from the involvement of the cardiac conduction system, resulting in varying degrees of sino-atrioventricular block. Occasionally, Lyme infection may also present with myopericarditis. Unlike isolated conduction node disease, myocardial involvement presents a great diagnostic and therapeutic dilemma for the physician. We report the case of a 68 year-old male cardiologist who presented with new onset exertional dyspnea and palpitations.

Electrocardiograms revealed intermittent Wenckebach with markedly prolonged PR interval varying between 290-350ms. During his hospitalization, he also had a transient episode of atrial fibrillation/flutter with AV block. The patient was promptly treated with intravenous Ceftriaxone. He remained hemodynamically stable, and within 48 hours of antibiotic treatment, the patient's arrhythmias began to resolve, and the PR interval had shortened to 230ms. He was discharged on oral Doxycycline for three weeks.

Case Report

A 68-year-old male Cardiologist, with history of Prediabetes and Benign Prostatic Hyperplasia, presented with new onset exertional dyspnea and palpitations. He reported these symptoms for one day; however, mild fatigue and general malaise had been present for approximately 6 weeks. Of note, he remained fairly active with excellent exercise tolerance until the day of presentation. The patient was an avid golfer and ran on the treadmill 5 days a week. He did not recall any tick bites, rashes or fever. Review of systems was otherwise negative. Physical examination revealed a well-nourished male who appeared his stated age.

Cardiac exam revealed irregularly irregular rhythm and a variable intensity of S1 and the remainder of the physical examination was unremarkable.

Electrocardiograms revealed intermittent Wenckebach with markedly prolonged PR interval varying between 290-350ms (figure 1) and a transient episode of atrial fibrillation/flutter with AV block (figure 2, 3). His labs were as follows: Lyme antibodies titers IgM

(3/3 bands) and IgG (5/10 bands) were positive: WBC 6.8 x 10⁹/L, RBC 13.1 g/dL, HCT 38.9%, platelet 203 x 10⁹/L, serum glucose 109 mg/dL, BUN 18 mg/dL, creatinine 1.03 mg/dL, Sodium 140 meq/L, Potassium 4.3 meq/L, chloride 103 meq/L, bicarbonate 28 meq/L, Calcium 9.3 mg/dL, Albumin 4.0 g/dL, T. Bilirubin 0.3 mg/dL, AST 72 units/L, ALT 150 units/L, ALP 115 units/L. On admission, his vitals were blood pressure 136/67, pulse 75, 98% oxygen saturation on room air, temperature 98.0 F. The patient was promptly treated with intravenous Ceftriaxone. Within 36 hours of antibiotics the patients arrhythmias began to resolve. By 48 hours the patients PR interval had shortened to 230ms (figure 4). The patient remained hemodynamically stable throughout admission, and was discharged on three weeks course of oral Doxycycline.

Discussion

Lyme borreliosis is the most prevalent tick-borne disease in the United State¹ Lyme disease exists throughout much of the world, including USA, Canada, Europe and Asia. In Europe and USA, Lyme carditis occur in approximately four percent of untreated Lyme disease patients^{2,3}

The degree of myopericardial involvement will largely dictate the broad array of clinical manifestations. While AV nodal disease is by far the most common manifestation, Lyme carditis may also present with SA node dysfunction, pericarditis, endocarditis, myocarditis, pericardial effusion, myocardial infarction, coronary artery aneurysm, QT interval prolongation, tachyarrhythmia's, and congestive heart failure⁴

Lyme infection should be suspected in any patient who engages in high-risk activities or lives in endemic areas. Our patient, an avid

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None.

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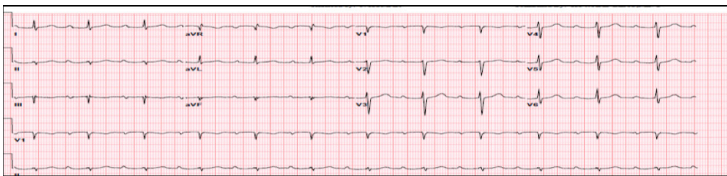


Figure 1

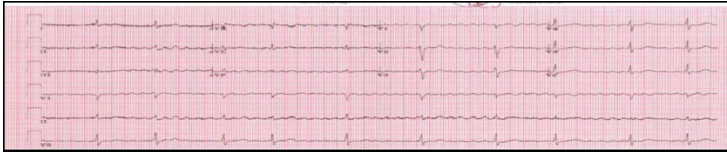


Figure 2

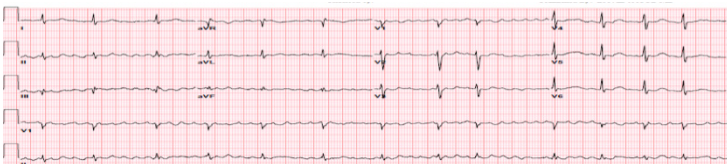


Figure 3



Figure 4

golfer living in a Lyme endemic area, presented with atrial fibrillation, and complete AV block with no prior cardiac disease or risk factors.

The association of Lyme carditis with Atrial Fibrillation is infrequently reported.⁵

The etiology may be related to either SA disease or myocarditis. Management of Atrial fibrillation in the setting of Lyme carditis poses many challenges, as many of our traditional algorithms used to treat arrhythmias would be deemed unsafe. Electrical Cardioversion in the setting of an inflamed myocardium could be proarrhythmic and fatal. Pharmacological cardioversion may uncover underlying AV nodal disease caused by Lyme and induce complete heart block. For the same reasons, Class I, II, III, and IV antiarrhythmic drugs traditionally used for rate control, cannot be used in this setting. Finally anticoagulation traditionally used for stroke prevention, would be contraindicated if concomitant pericardial involvement is present for the fear of causing hemopericardium.

Antibiotics remain the mainstay of therapy.⁶ There have been no trials to compare one antibiotic from another; the data on appropriate treatment regimen comes mainly from case reports and case series. Intravenous ceftriaxone is the drug of choice in symptomatic patients (e.g. syncope, dyspnea, or chest pain) and asymptomatic patients with marked PR prolongation (PR>300ms);⁷ as the degree of block may fluctuate and rapidly worsen in such patients. Patient allergic to penicillin and its derivatives should be desensitized. IV antibiotic should be continued till the PR interval is <300ms.⁶ Asymptomatic patient should be treated with oral doxycycline, except in children <8 years old and pregnant women, where amoxicillin can be used.

Only one third of patients remember a tick bite or present with a

rash,⁸ neither the serodiagnosis is positive in the initial weeks of the illness. This case is a timely reminder for all resident physicians that Lyme disease should be high on differential in a patient with atypical presentation of Atrial fibrillation and conduction defect. If untreated the natural history of Lyme carditis will often result in congestive heart failure and/or sudden cardiac death.⁹ Misdiagnosis of AV dysfunction could lead to unnecessary implantation of a permanent pacemaker. Thus the treatment algorithm in Lyme induced Atrial fibrillation is different, and largely depend upon prompt diagnosis and antibiotics.

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