



Lyme Carditis with High Degree AV Block: Is Pacemaker the Answer?

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Introduction

- Lyme disease, a tick-borne illness caused by *Borrelia burgdorferi*, is a multi-system disease complicated by carditis in up to 1-10% of the patients.
- The most common manifestation is AV node conduction system abnormalities presenting as various degrees of heart blocks.
- We describe two similar presentations of Lyme carditis requiring treatments on both ends of the spectrum: ranging from isolated IV antibiotics to permanent pacemaker placement.

Case Presentation

Case: 1

- A 27-year-old healthy Caucasian male presented to the hospital with a two-week history of palpitations.
- He endorsed myalgias but denied any rash, fever, or arthralgias. He was unaware of any tick bites.
- On admission, vitals were notable for bradycardia with HR: 52/min.
- The initial electrocardiogram (EKG) showed a complete heart block (CHB)[Figure 1].
- Transthoracic echo (TTE) revealed a normal left ventricular ejection fraction (LVEF).
- Lyme antibody screen showed positive titers, and the patient was started on empiric intravenous (IV) ceftriaxone.
- Subsequent EKG on day five showed resolution to normal sinus rhythm.
- A follow-up western blot came back positive for Lyme IgM [Figure 2].
- The patient was discharged home on oral doxycycline to complete a 21-day course.

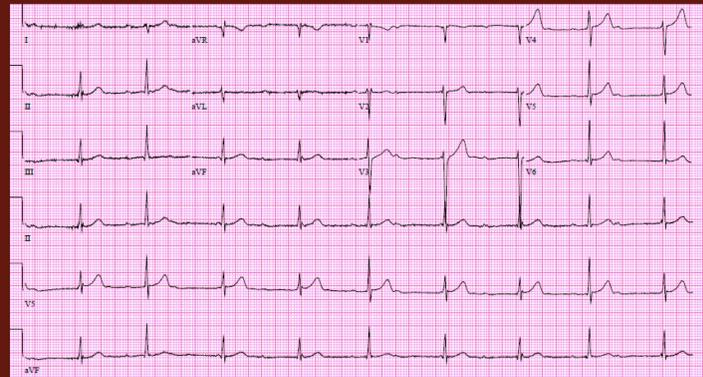


Figure 1: EKG showing complete heart block (CHB)

	Lyme antibody screen titres	Western Blot Lyme IgM Ab			Western Blot Lyme IgG Ab									
		23KD	39KD	41 KD	18 KD	23KD	28 KD	30 KD	39 KD	41 KD	45KD	58 KD	66 KD	93KD
Case 1	+	+	+	+	+	-	-	-	+	+	-	+	-	-
		NET: +			NET: -									
Case 2	+	+	+	+	+	+	-	-	+	+	+	+	-	-
		NET: +			NET: +									

Figure 2: Lyme titer

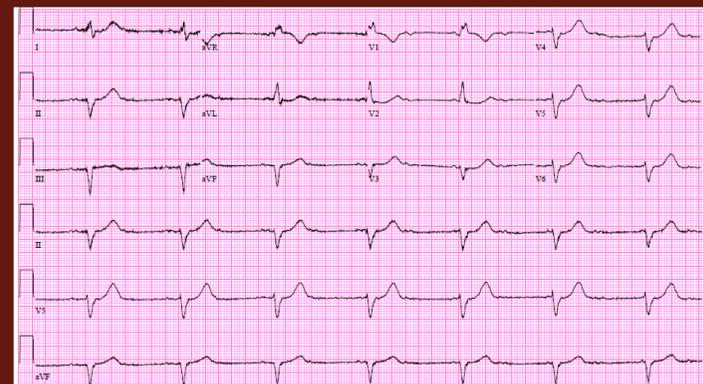


Figure 3: EKG showing a 2:1 atrioventricular (AV) block and right bundle branch block (RBBB)

Case Presentation

Case: 2

- A 66-year-old Caucasian male presented to the hospital with a one-week history of dyspnea. Presentation vitals were notable for bradycardia of 40 bpm, and physical exam was unremarkable. Initial lab work was normal. Lyme antibody screen revealed positive titers.
- His EKG showed a 2:1 atrioventricular (AV) block and right bundle branch block [Figure 3].
- A working diagnosis of Lyme carditis vs underlying structural heart disease (SHD) was proposed. A subsequent nuclear stress test was negative for any ischemia but revealed an old inferior infarct. TTE revealed normal LVEF. The patient was started on IV ceftriaxone.
- A follow-up western blot came back positive for Lyme IgM and IgG[Figure 2].
- On day seven, a four-second sinus pause was noticed on continuous telemetry and a repeat EKG revealed a CHB.
- The patient was started on a dopamine drip. As the CHB persisted for ten days, the decision was made to proceed with pacemaker placement. He underwent permanent pacemaker placement on day eleven and was discharged home to complete a 21-day course of IV ceftriaxone.

Discussion

- Lyme carditis is one of the reversible etiologies of conduction system anomalies. Management with 10-14 days of IV antibiotics results in resolution of EKG changes. However, permanent pacing is required if a high degree AV block persists after 14 days of treatment.

Conclusion

- Patients with suspected Lyme carditis should be watched closely for ongoing rhythm abnormalities to assess the need for pacing, especially in patients who are at high risk for underlying conduction system disease.