

A 34-Year-Old Woman with Third-Degree Heart Block and Atrial Flutter Associated with Lyme Carditis

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Background

Introduction:

Lyme disease is a tick-borne illness caused by bacteria of the *Borrelia* genus, endemic to the northeastern region of the United States. It typically presents with fevers, myalgias, and erythema migrans, but it can result in disseminated symptoms if left untreated. Lyme carditis is a rare, but potentially fatal complication of Lyme disease, occurring in up to 4–10% of untreated cases [1]. Typically, it presents with atrioventricular conduction abnormalities, which resolve with intravenous antibiotics and temporary pacing if indicated. Diverse cardiac pathology, however, has been associated with Lyme carditis, which may be underrecognized in practice.

Case Report

Presentation:

A 34-year-old woman presented to a hospital in Rhode Island with fatigue, dizziness, and shortness of breath. The patient had camped in a wooded area 2 weeks prior to hospitalization and noticed targetoid rashes on her left shoulder and breast 2 weeks after camping

Pertinent vital signs and physical exam:

Vital signs notable for HR 58 beats/min and BP 105/66 mmHg. Cardiovascular examination was notable for an irregular bradycardic rhythm. Skin examination was notable for targetoid rashes present on her left shoulder and left breast, characterized as typical erythema migrans.

Laboratory studies:

Laboratory work-up notable for positive Lyme serologies, markedly elevated D-dimer, normal T4/TSH, SARS-CoV-2 PCR, ANA, BNP, anaplasma phagocytophilum PCR, and parasite thick smear.

EKGs:

The patient's admission EKG was notable for LBBB morphology suggestive of infra-Hisian blockade (Fig. 1). A later EKG taken on arrival to the coronary care unit demonstrated reverse typical atrial flutter with T-wave inversions in septal leads (Fig. 2).

Clinical Data

Fig 1: Admission EKG, demonstrating LBBB morphology suggestive of infra-Hisian blockade

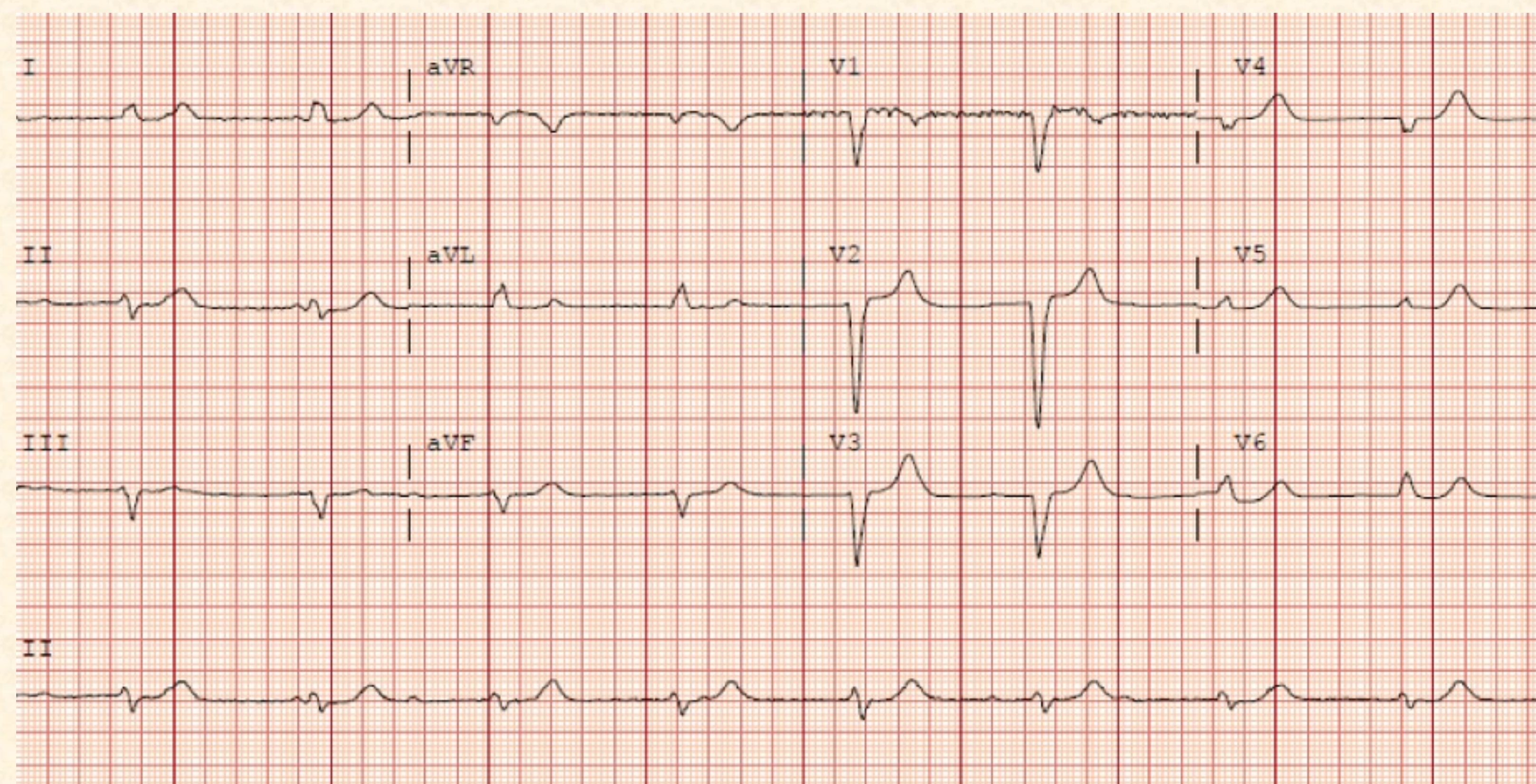
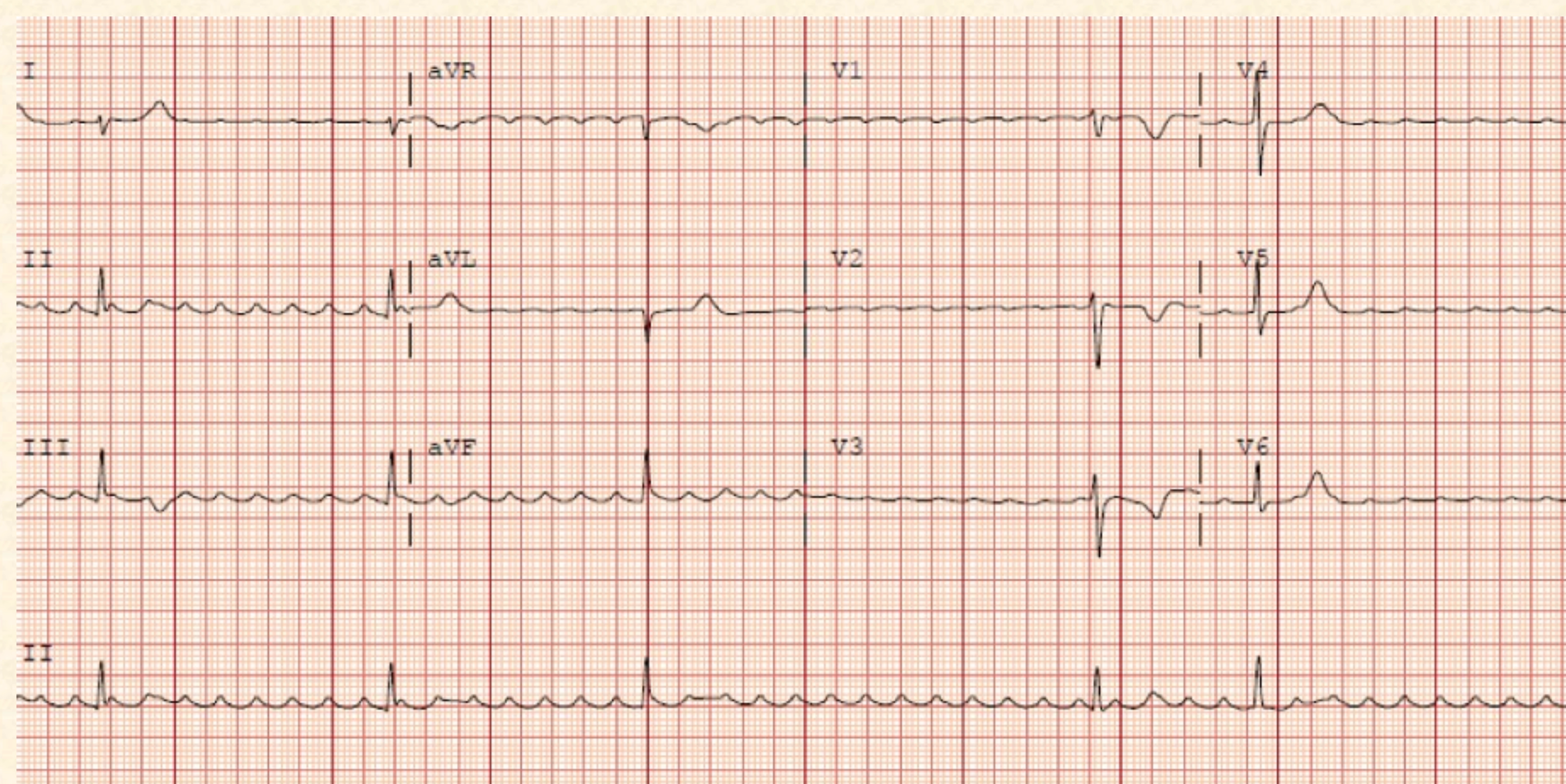


Fig 2: EKG demonstrating reverse typical atrial flutter



Clinical course:

The patient was admitted to the coronary care unit and started on empiric ceftriaxone, given her elevated SILC score [2, 3]. The infectious disease team was consulted, conferring with management. EKGs were obtained as above (Fig 1 and 2). Electric cardioversion was ultimately pursued, with restoration of normal sinus rhythm with first-degree heart block, as well as interval improvement of known T-wave inversions.

Discussion

This case report presents a patient with Lyme carditis complicated by atrial flutter, successfully treated with antibiotics and synchronized electrical cardioversion. The case demonstrates the diversity of cardiac pathology and rhythm disturbances that can be associated with Lyme carditis, and highlights the utility of employing the SILC score to characterize patient presentations of unexplained bradycardia and conduction abnormalities [2]. The decision to pursue synchronized electrical cardioversion was made after a discussion of risks and benefits with the patient and care team, as standards are yet to be determined specifically for supraventricular tachyarrhythmias within this disease process. As the geographic reach of Lyme disease expands, greater vigilance among clinicians is warranted to ensure timely recognition and management of Lyme carditis.

Selected References

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3. Besant G, Wan D, Yeung C, et al. Suspicious index in Lyme carditis: Systematic review and proposed new risk score. *Clin Cardiol*. 2018;41(12):1611–16.