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Bradycardia and a Rash

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ABSTRACT

A case of a 37 year old male who presented with a short history of symptomatic complete heart block and a rash is described. Laboratory testing confirmed a diagnosis of Lyme disease and the patient made a complete recovery following appropriate antibiotic therapy. Lyme carditis is rare in Canada, but the risk of exposure to the disease is increasing due to the expanded range of *Ixodes scapularis*, a process that is predicted to accelerate with climate change.

Key Words:

complete heart block, Lyme carditis

CASE

A previously healthy 37 year old male presented with a 3 day history of lightheadedness, fatigue, and arthralgia. One month prior he had been camping in the Lake of the Woods, Canada region. On examination, his heart rate was 38 bpm and regular, his blood pressure was 120/70 mmHg and his temperature was 36.1°C. Canon a waves were visible in the neck consistent with AV dissociation. Skin examination revealed erythematous lesions on the trunk consistent with erythema chronicum migrans. A 12 lead electrocardiogram (ECG) confirmed sinus rhythm with complete heart block. (figure 1)

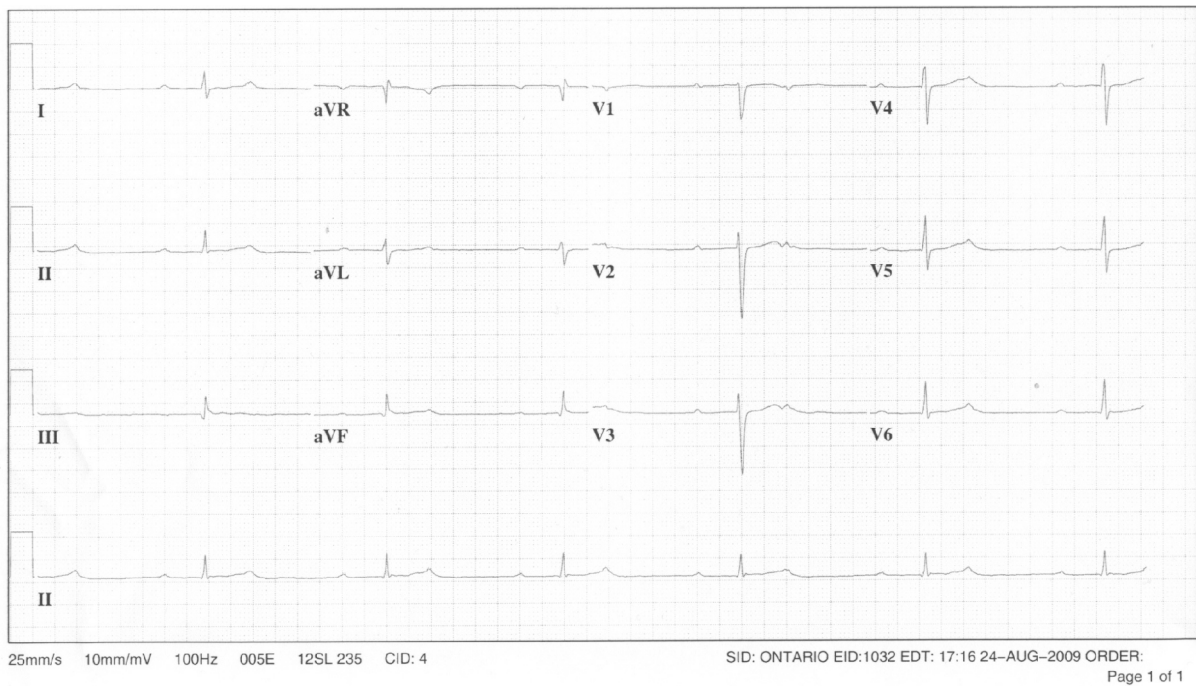
Figure 1



Blood count, renal and thyroid function and echocardiography were normal.

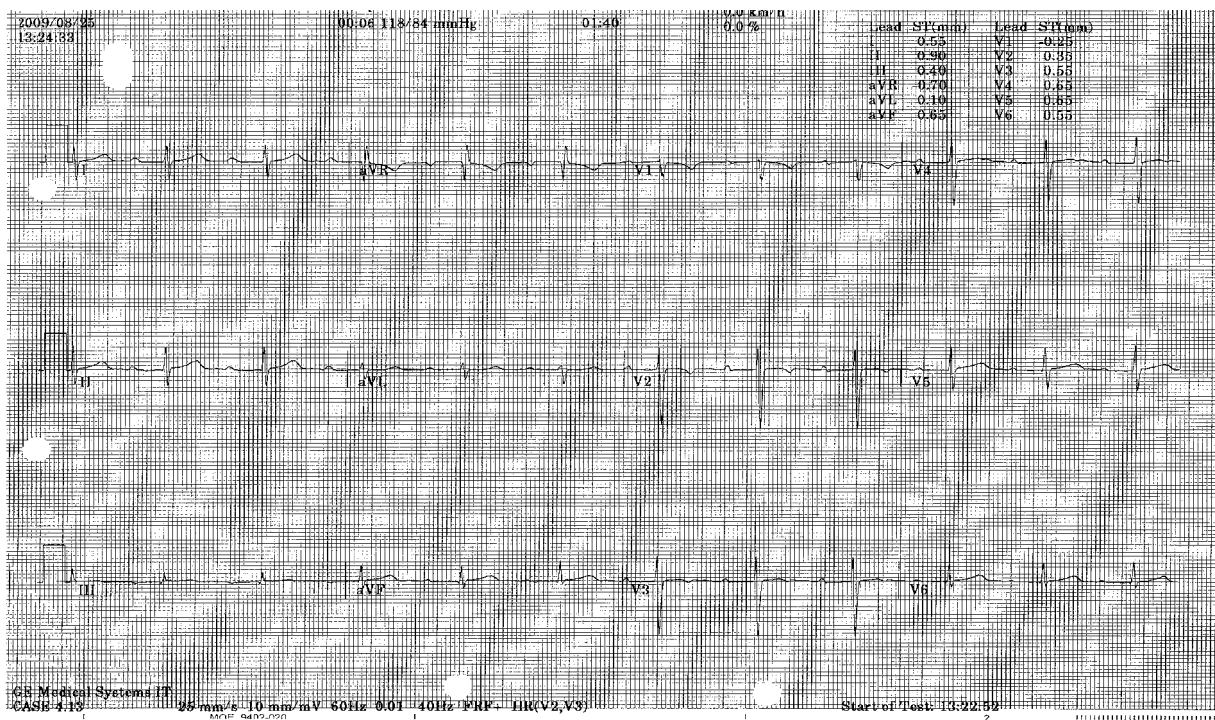
A clinical diagnosis of Lyme carditis was made and empiric treatment with third generation cephalosporins. The complete heart block initially improved with intermittent AV conduction in a pattern of second degree AV block (figure 2)

Figure 2



and 6 days after starting antibiotics his rhythm returned to sinus. (figure 3)

Figure 3



Laboratory testing confirmed a positive Western Blot IgG.

DISCUSSION

Lyme disease is a worldwide systemic illness caused by the spirochete *Borrelia burgdorferi* and transmitted by the *Ixodes Scapularis* tick. The overall incidence in the United States (U.S.) is 7.86 cases per 100, 000.(1)

In Canada, Lyme disease is not common and there is considerable variation in reported human cases from year to year. The risk for exposure is highest in a small number of regions where the ticks that transmit Lyme disease are known to be established including parts of southern and eastern Ontario, southeastern Manitoba and Nova Scotia as well as southern British Columbia.(2)

The median age of infected patients is 41 years with slight male predominance. Infection predominates in the summer months. Between 4% and 10% of patients in the U.S. who have untreated Lyme disease develop carditis.(1) Lyme carditis is rare, however, in Canada. Cardiovascular complications were first described nearly 30 years ago. Cardiac abnormalities, predominantly involving the conduction system and myocardium, usually manifest at the early disseminated stage occurring weeks to months after the early localized infection. The principle manifestation is self-limited conduction abnormalities, most commonly varying degrees of atrioventricular conduction delay.(3) Less frequently, pericarditis, myocarditis, pericardial effusion, myocardial infarction, coronary artery aneurysm, QT-interval prolongation, tachyarrhythmias, and congestive heart failure have been reported.

The diagnosis of Lyme carditis should be guided by the patient's clinical situation, with the results of laboratory tests providing supportive evidence of infection.(4) Echocardiography and MRI may be useful in selected circumstances. Public health laboratories in Canada, the United States and some European countries advocate a two-tiered serologic testing process, consisting of enzyme-linked immunosorbent assay followed by western blot, to assist in diagnosis.

Antibiotic therapy in the early stages of Lyme disease has been reported to prevent or attenuate later complications of the disease. Patients who have minor cardiac involvement and no other symptoms should receive oral antibiotic therapy with amoxicillin or doxycycline as for early disease. Patients who have more severe conduction system disease, such as second- or third-degree atrioventricular block or clinical evidence of congestive heart failure should be hospitalized and administered intravenous ceftriaxone or high-dose penicillin G for 2 to 4 weeks.(3) Complete heart block generally resolves within one week, with resolution of lesser conduction disturbances within six weeks.(5)

SUMMARY

Recent studies have suggested that the risk of exposure to Lyme disease is increasing because the range of *Ixodes scapularis* is expanding, a process that is predicted to accelerate with climate change.(2) Clinicians should be aware of the clinical manifestations of the disease in order to initiate appropriate treatment in a timely fashion to minimize systemic disease and, in particular, cardiovascular complications.

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