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Key Words:

Lyme disease, Pericardial effusion,
Pericardiocentesis, Pre-operative as-
sessment, Case report

An Unusual Cardiac Manifestation of Lyme Disease in a Nigerian Patient: A Case Report and Literature Review

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Abstract

Introduction: Cardiac involvement in Lyme disease is most commonly manifested as atrioventricular conduction disease; pericardial involvement, though far less common, is increasingly recognized and can occasionally be hemodynamically significant.

Case Presentation: We report the case of a 63-year-old woman who presented for pre-operative assessment before a planned left total knee replacement, twelve weeks after a diagnosis of Lyme disease following tick exposure abroad. A routine pre-operative chest radiograph revealed unexplained cardiomegaly, and subsequent echocardiography identified a large pericardial effusion without evidence of tamponade.

Because general anaesthesia was planned for her knee surgery, pericardiocentesis was performed electively to minimize anaesthetic risk; approximately 350 mL of clear fluid was drained without complication. Follow-up echocardiography confirmed complete resolution with no recurrence.

Conclusion: This case illustrates that pericardial effusion can be an incidental, clinically silent manifestation of Lyme disease, and that pericardiocentesis is a safe and effective intervention even in the absence of tamponade when it reduces peri-operative risk. Furthermore, the optimal duration of antimicrobial therapy in atypical or prolonged presentations remains an area of clinical uncertainty warranting further study.

Introduction

Lyme disease is caused by *Borrelia burgdorferi*. Cardiac involvement in Lyme disease is rare, yet its manifestation is typically associated with atrioventricular conduction disturbances.¹ The clinical spectrum of *Borrelia burgdorferi* infection occasionally extends to include inflammatory pericardial processes, which may lead to hemodynamically significant effusions.² Although the pathophysiology of such cardiac engagement is often characterised by myocardial inflammation or conduction delays, rare instances of effusive-constrictive processes can necessitate urgent intervention,^{3,4} requiring clinical vigilance to differentiate between transient exudative responses and the underlying restrictive hemodynamic features of effusive-constrictive pericarditis.⁵ we hereby describe a case of large, incidentally detected pericardial effusion in a patient with recently diagnosed Lyme disease, managed with elective pericardiocentesis prior to orthopaedic surgery, and to review the current literature on Lyme-associated pericardial disease, the safety of pericardiocentesis with indwelling drainage, and the optimal duration of antimicrobial therapy, in order to highlight the importance of cardiac screening and multidisciplinary vigilance in patients with Lyme disease.

Case Presentation

A 63-year-old woman presented for pre-operative evaluation ahead of a planned left total knee replacement, five years after an uncomplicated right total knee replacement performed in 2021 at another institution. Her background

included bilateral knee osteoarthritis. She had recently been diagnosed with Lyme disease twelve weeks earlier, following possible travel-associated tick exposure; she had recently visited Monaco, the United Kingdom, and other locations not traditionally associated with Lyme disease. In May of this year, she developed skin lesions on her face while in Monaco, prompting further investigation. A skin biopsy performed in the UK was positive for immunoglobulin M (IgM) antibodies to Lyme disease. Human immunodeficiency virus (HIV) screening, QuantiFERON-TB testing, and autoimmune screening were all negative. A chest radiograph performed at that time demonstrated cardiomegaly with left ventricular preponderance (Figure 1). She was commenced on doxycycline 100 mg twice daily, for an advised course of twelve weeks, and was referred to a cardiologist on account of the cardiomegaly. She subsequently presented to our institution for pre-operative evaluation of the planned left total knee replacement. In view of the cardiomegaly and pending cardiology review, an electrocardiogram (ECG) was performed and was unremarkable (Figure 2); echocardiography was therefore recommended and subsequently confirmed a large pericardial effusion (Figure 3), with no evidence of cardiac tamponade. As she was due to undergo general anaesthesia for the knee replacement, it was felt reasonable to perform pericardiocentesis to reduce anaesthetic risk. Pericardiocentesis was performed without complication. Echocardiography performed 24 hours after drainage showed complete resolution of the effusion with no residual abnormality, and a further echocardiogram one week later confirmed no recurrence; she was subsequently cleared to undergo her left total knee replacement.

On examination, she was fully oriented (Glasgow Coma Scale (GCS)15/15). Vital signs were stable; temperature

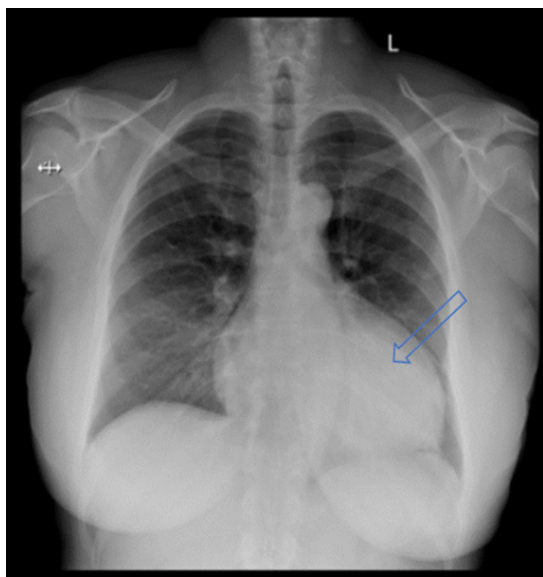


Figure 1: Pre-operative chest radiograph demonstrating cardiomegaly with left ventricular preponderance and clear lung fields.

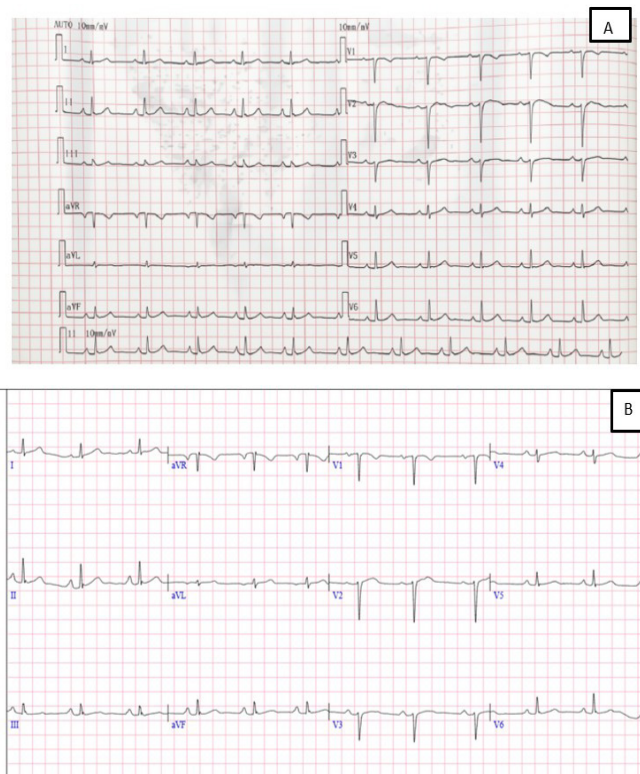


Figure 2: Twelve-lead electrocardiograms showing normal sinus rhythm, normal axis, and no atrioventricular conduction abnormality(a) Before (b)After drainage.

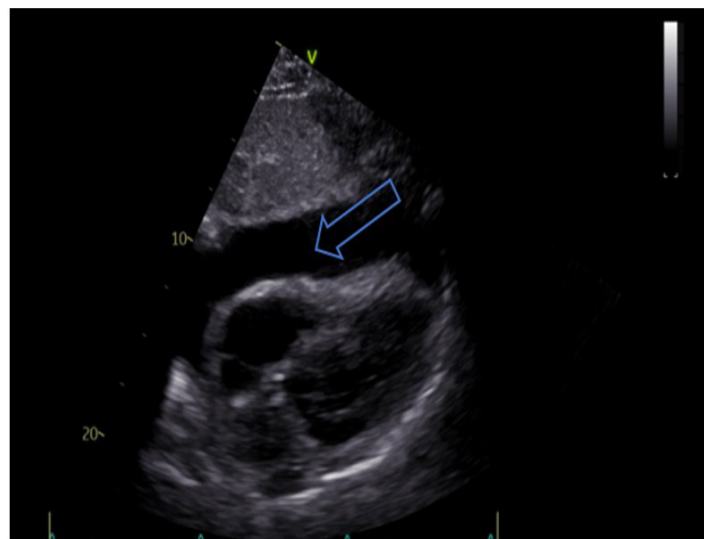


Figure 3: Transthoracic echocardiogram demonstrating a large pericardial effusion prior to pericardiocentesis

36.9°C, pulse 90 bpm, respiratory rate 26/min, blood pressure 131/60 mmHg, peripheral oxygen saturation (SpO₂) 99%. Clinical examination was otherwise unremarkable: chest wall movement was symmetrical, the abdomen was soft and non-tender, skin integrity was intact, and there was no peripheral oedema.

Chest radiography confirmed cardiomegaly (cardiothoracic ratio approximately 61%) with a left ventricular configuration, clear lung fields, and no

acute cardiopulmonary abnormality; echocardiographic correlation was recommended and subsequently obtained. Electrocardiography showed normal sinus rhythm, a normal PR interval (192 ms), normal QRS duration (78 ms), and a normal QTc (409 ms), with no evidence of atrioventricular (AV) block, the most common cardiac manifestation of Lyme disease. Baseline vital-sign monitoring throughout admission remained within normal limits.

Management and Clinical Course

After informed consent, the patient underwent bedside pericardiocentesis under echo monitoring, with an indwelling 6Fr pericardial drain sited. Approximately 350 mL of clear fluid was drained almost immediately. She developed post-procedural pain, initially managed with intravenous paracetamol 1 g, and subsequently with intravenous ketorolac 30 mg. Clear fluid continued to drain from the tube overnight with the head of the bed elevated.

Approximately 100 mL of additional fluid had drained by midnight at which point the pericardial drain had become dislodged. She remained haemodynamically stable overnight with no further pain or dyspnoea. She underwent echocardiography which showed complete resolution of the effusion and was deemed fit for discharge. She was discharged home with no further complaints of pain or discomfort.

Table 1: Summary of laboratory investigations

Component	Patient value	(normal range)
Sodium	141	(135-150 mmol/L)
Potassium	3.7	(3.5-5.0 mmol/L)
Creatinine (Cr)	59	(μ mol/L (Male (62-115) ; (Female 53-97))
White blood cells (WBCs)	4.90	(4.0 - 11.00 $\times 10^9$ /L)
Rheumatoid Factor	8.0	(< 15) IU/mL)
ANA*	Negative	(<1:80 Titre)
Anti-CCP**	Negative	(< 3.5) (< 5.0 EU/ml)

*Anti CCP=Anti-Cyclic Citrullinated Peptide; **ANA=antinuclear antibody.

Routine laboratory investigations in our patient were unremarkable. Electrolytes, renal function, and white blood cell count were all within normal limits, and inflammatory markers were not reported as elevated

Discussion

Pericardial Disease as a manifestation of Lyme disease

Cardiac involvement in Lyme disease is most classically associated with AV conduction block, but pericardial involvement is increasingly recognised as a distinct manifestation. The conduction of electrical signals to the heart is slowed down, which can be induced by Lyme carditis, but pericardial involvement inflames the pericardial sac. A

recent case report described effusive-constrictive Lyme pericarditis in which serial cardiac magnetic resonance imaging and invasive haemodynamic assessment identified a reversible inflammatory phenotype that supported conservative, non-surgical management rather than pericardiectomy.¹

Similarly, a case report and literature review of Lyme-associated pericarditis emphasised that initial Lyme serology may be falsely negative and should be repeated after 4–6 weeks if clinical suspicion is high, since delayed diagnosis can permit progression of cardiac complications.² At the more severe end of the spectrum, a fulminant case of Lyme carditis in an adolescent progressed from a small pericardial effusion and biventricular dysfunction to fatal cardiogenic shock within twelve hours³, underscoring that close cardiac monitoring is warranted even when initial presentation appears mild, as was the case for this patient, whose effusion was detected incidentally and who remained hemodynamically stable throughout.

A further report of tick-borne myopericarditis with concurrent Lyme, Anaplasma, and false-positive Epstein–Barr virus serology illustrates that co-infection and serological cross-reactivity should be considered in atypical presentations.⁴ These cases form different manifestation lyme associate pericardial disease and can have different approaches and management, which is quite different from lyme associate pericardial effusion presented in the current case study.

Pericardiocentesis and indwelling drain care

Contemporary series support pericardiocentesis with an indwelling pigtail catheter as a safe, low-complication procedure: a hybrid-operating-room fluoroscopy-guided series reported a minor complication rate of only 1.5% and reintervention in 3.1% of patients at three months⁵. However, indwelling drains are not without risk after the immediate procedure. A 2025 case report described a cutaneous–pericardial fistula with secondary purulent pericarditis presenting six weeks after catheter removal, resulting in septic shock and multi-organ dysfunction, and the authors specifically emphasised the need for vigilant monitoring and care of pericardial drains, including prompt recognition of mechanical or infective complications^{6,7}. This supports the clinical vigilance demonstrated in this patient's case, particularly when the drain was found to be dislodged. A prompt medical review, quantification of the drained volume, and a low threshold for repeat imaging (echocardiography) to reassess residual fluid, rather than immediate reinsertion, were a reasonable and evidence-based course of action.

Doxycycline treatment duration

Current research and the National Institute for Health and Care Excellence (NICE) guideline on the treatment of Lyme borreliosis reaffirms doxycycline as first-line therapy⁸, with duration individualised by clinical manifestation: 10 days for isolated erythema migrans, 14 days for early neuroborreliosis, 21 days for late neuroborreliosis, and 28 days for Lyme arthritis or acrodermatitis chronica atrophicans, with longer courses considered unjustified in uncomplicated cases.^{8–12} In the present case, however, the treating physician in the UK initiated a twelve-week (84-day) course of doxycycline, considerably longer than that recommended in the literature. This extended duration may reflect recurrent infection,¹³ late presentation, or evidence of persistent infection.¹⁴ The pericardial effusion was discovered at week 10 of treatment; given the case series discussed above, this supports a role for serial echocardiography as an initial screening tool in patients with Lyme disease, since pericardial effusion can be a manifestation of the disease. The decision to perform pericardiocentesis even though there was no evidence of tamponade, with tachycardia, or haemodynamic compromise was because she was to have a left knee replacement, and general anaesthesia in the presence of a very large pericardial effusion was considered a risk, given the potential for haemodynamic decompensation during the peri-operative period. This approach is supported by one report¹⁵ but conflicts with another report.¹⁶ suggesting variability in practice between different medical centers.

Conclusion

This case describes a large, haemodynamically insignificant pericardial effusion associated with Lyme disease. The patient had no overt cardiac symptoms or classical atrioventricular conduction abnormalities. Cardiomegaly was detected incidentally on routine imaging, and echocardiography confirmed the effusion. Elective pericardiocentesis was performed before planned orthopaedic surgery to reduce potential anaesthetic risk, resulting in complete and sustained resolution.

Limitations

This report has several limitations. As a single-patient case report, its findings cannot establish a causal relationship between Lyme disease and pericardial effusion, nor can they be generalised to the wider population of patients with Lyme borreliosis. Furthermore, the absence of classical atrioventricular conduction abnormalities does not exclude other potential causes of the effusion. Alternative infectious, inflammatory, autoimmune, malignant, and idiopathic causes may not have been comprehensively excluded.

The temporal relationship between antimicrobial therapy, pericardiocentesis, and subsequent resolution of

the effusion also makes it difficult to determine the extent to which each intervention contributed to the clinical outcome. The absence of a comparator patient or a documented untreated clinical course further limits assessment of the natural history of the effusion. Interpretation is also constrained where pericardial fluid analysis, Lyme-specific testing, inflammatory markers, electrocardiographic monitoring, or serial follow-up imaging were incomplete.

Finally, the prolonged course of doxycycline used in this case should not be interpreted as evidence that extended antimicrobial therapy is necessary for similar presentations. The optimal duration of treatment for atypical Lyme-associated pericardial disease remains uncertain, and the efficacy of any treatment regimen cannot be established from a single case.

Future perspective

Further research is needed to determine how frequently pericardial involvement occurs in Lyme disease and whether it represents an under-recognised manifestation of Lyme carditis. Prospective studies should investigate the clinical features, echocardiographic findings, underlying mechanisms, and outcomes of patients with Lyme-associated pericardial effusion. Research is also required to establish which patients benefit from echocardiographic screening and when invasive drainage is appropriate in the absence of tamponade, particularly before non-cardiac surgery.

In addition, prospective studies should evaluate the optimal antimicrobial regimen and treatment duration for atypical or prolonged presentations of Lyme disease. Standardised diagnostic and management pathways involving infectious disease, cardiology, anaesthesia, and surgery could help reduce variation in clinical practice and improve peri-operative safety. Until stronger evidence is available, clinicians should adopt an individualised, multidisciplinary approach and avoid extending antimicrobial therapy beyond evidence-based recommendations without a clear clinical rationale.

Declarations

This article was previously posted to the Research square preprint server on 21 Aug, 2026, with previous title as “An Unusual Case of Pericardial Effusion Requiring Pericardiocentesis in a Newly Diagnosed Lyme Disease Patient in Nigeria: A Case Report and Literature”

Ethical Approval

Informed consent for treatment and open access publication was obtained or waived by all participants in this study. Quality Improvement Department Ethics Committee issued approval EMH-26-001. Ethical approval for this

case report was obtained from the Quality Improvement Department Ethics Committee of the Euracare Multispecialist Hospital, Lagos, Nigeria. Written informed consent was also obtained from the patient for the publication of this case report and any accompanying images.

Conflicts of interest: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

Funding: All authors have declared that no financial support was received from any organisation for the submitted work.

Author contributions: TM provided clinical oversight, led the research, patient management and data gathering, and served as the primary consultant cardiologist on the case. C.M.N supported the literature review, gathered supporting data, drafted the manuscript, reviewed it, and provided expert input as a medical professional. All authors read and approved the final version of the manuscript.

Acknowledgement: We will like to acknowledge the efforts of Ijeoma J. Nzekwe, Head of the Department of Quality and Patient Safety, Euracare Multi-Specialist Hospital, Lagos State, Nigeria, for their efforts toward ensuring patient safety and record management, especially for this case report.

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Citation: Tosin Majekodunmi¹, Moses Chibueze Nnamdi², An Unusual Cardiac Manifestation of Lyme Disease in a Nigerian Patient: A Case Report and Literature Review. Jour of Clin Cas Rep, Med Imag and Heal Sci 14 (5)-2026.

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