

Case Report

Myopericarditis Complicated With Cardiac Tamponade Due to *Campylobacter fetus* Infection

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ABSTRACT

About 90% of cases of acute pericarditis have an idiopathic or viral etiology. In some cases, it is possible to identify high-risk patients for whom hospital admission and specific etiology research are mandatory for adequate treatment. Bacterial pericarditis is uncommon and responsible for less than 1% of cases. Only 10 cases of pericarditis due to *Campylobacter fetus* have been documented worldwide. This case highlights the importance of good cardiac imaging, with the right clinical and microbiology-integrated approach in high-risk cases of pericardial disease.

RÉSUMÉ

Environ 90 % des cas de péricardite aiguë sont d'étiologie idiopathique ou virale. Dans certains cas, il est possible de déterminer les patients exposés à un risque élevé pour qui l'admission à l'hôpital et la recherche d'une étiologie précise sont indispensables pour offrir le bon traitement. La péricardite bactérienne est rare et représente moins de 1 % des cas. Seuls 10 cas de péricardite à *Campylobacter fetus* ont été consignés dans le monde. Ce cas illustre l'importance d'une bonne imagerie cardiaque selon une bonne approche clinique et microbiologique intégrée chez les cas exposés à un risque élevé de maladies péricardiques.

Acute pericarditis is the most common pericardial disease worldwide.¹ About 90% of these cases have an idiopathic etiology. However, in some cases, it is possible to identify a specific etiology, such as bacterial infection.² Pericardial disease also can be associated with inflammation of the heart's muscle cells, and with pericardial effusion and cardiac tamponade. We describe a case of myopericarditis complicated with cardiac tamponade due to *Campylobacter fetus* infection.

Case

A 71-year-old man with history of chest pain and shortness of breath during 1 week presented to the emergency department. At admission, his blood pressure was 120/70 mm Hg, his heart rate was 102 beats per minute, his temperature was 37.1 °C, his respiratory rate was 30 breaths per minute, and he had an oxygen saturation of 87% while he was breathing fresh air. On physical examination, Kussmaul's sign (jugular venous distention during inspiration), muffled heart sounds, and

Novel Teaching Points

- Cardiac tamponade is a clinical diagnosis.
- Transthoracic echocardiography is the first-line imaging study performed for the confirmation of cardiac tamponade.
- Myopericarditis due to *C. fetus* infection can be treated with clarithromycin, colchicine, and aspirin.
- A good clinical examination, adequate cardiac imaging tools, and a microbiological approach are mandatory in all suspected high-risk cases of pericardial disease.

paradoxical pulse (descent of more than 10 mm Hg of the systolic blood pressure at inspiration) were found to be present. The clinical findings suggested pericardial effusion complicated with cardiac tamponade. The 12-lead electrocardiogram showed sinus tachycardia with diffuse ST-segment elevation in the inferior and precordial leads (Fig. 1A).

His laboratory findings were all unremarkable, except for a markedly high white blood cell count (15.6 cells $\times 10^3/\mu\text{L}$), elevated levels of C-reactive protein (249 mg/L), high levels of cardiac enzymes (troponin I 1.71 ng/mL [0.01–0.04 ng/mL] and creatinine kinase-MB 6.4 ng/dL [0.06–6.3 ng/dL]). A

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transthoracic echocardiogram revealed a nondilated left ventricle with normal systolic function, the presence of loculated and moderate pericardial effusion (14 mm), and signs of cardiac tamponade (diastolic collapse of the right atrium and ventricle ([Video 1, view video online], inferior vena cava dilatation, exaggerated ventricular interaction, and increased respiratory variation in tricuspid inflow [50%], and transmitral flow variation of 25%) (Fig. 1B).

Pericardiocentesis was not performed due to the characteristics of pericardial effusion (the presence of loculated effusion). The patient underwent surgical pericardial drainage with pericardial fenestration and extraction of 500 mL of cloudy pericardial fluid. Pericardial fluid and biopsy were taken. Biochemical analysis of the pericardial fluid revealed exudate characteristics (proteins 3.8 g/dL, lactate dehydrogenase 6269 U/L, and fluid protein/serum protein 0.73). In microscopy analysis, findings compatible with acute pericarditis were present: fibrino-hematic histologic characteristics, inflammation, and pericardial thrombus (Fig. 1C). *C. fetus* was isolated in bacterial cultures. After the drainage, the clinical signs of pericardial tamponade were no longer present and there was no evidence of pericardial effusion. Medical treatment with clarithromycin, colchicine, and aspirin was started.

Cardiac magnetic resonance imaging (CMR) was performed after the drainage of the complex effusion and revealed mid-

myocardial and pericardial late gadolinium enhancement with no regional wall motion abnormalities (Fig. 2). The patient was discharged 13 days after admission without complications.

Discussion

The term myopericarditis refers to an inflammatory pericardial syndrome with associated myocardial involvement, with or without pericardial effusion.² Bacterial infections are a rare cause of pericarditis and account for less than 1% of cases. When bacterial infections are responsible for pericardial effusions, they tend to form large effusions with rapid progression to cardiac tamponade.^{1,2} In the current literature, there are only 10 documented cases worldwide of pericarditis in which *C. fetus* has been identified as the causative agent.³

C. fetus infection is a rare cause of disease, isolated in 2.4% of all cases of diarrhea attributed to *Campylobacter* species. The main reservoir is the gastrointestinal tract of cattle and sheep. The infection is due to oral ingestion of contaminated food, followed by intestinal colonization and systemic invasion through hematogenous spread. The risk factors for acquiring the infection are immunosuppression, alcohol abuse, liver disease, pregnancy, medical devices, and being elderly.⁴ In this patient, the only risk factor was age (other risk factors were interrogated and excluded).

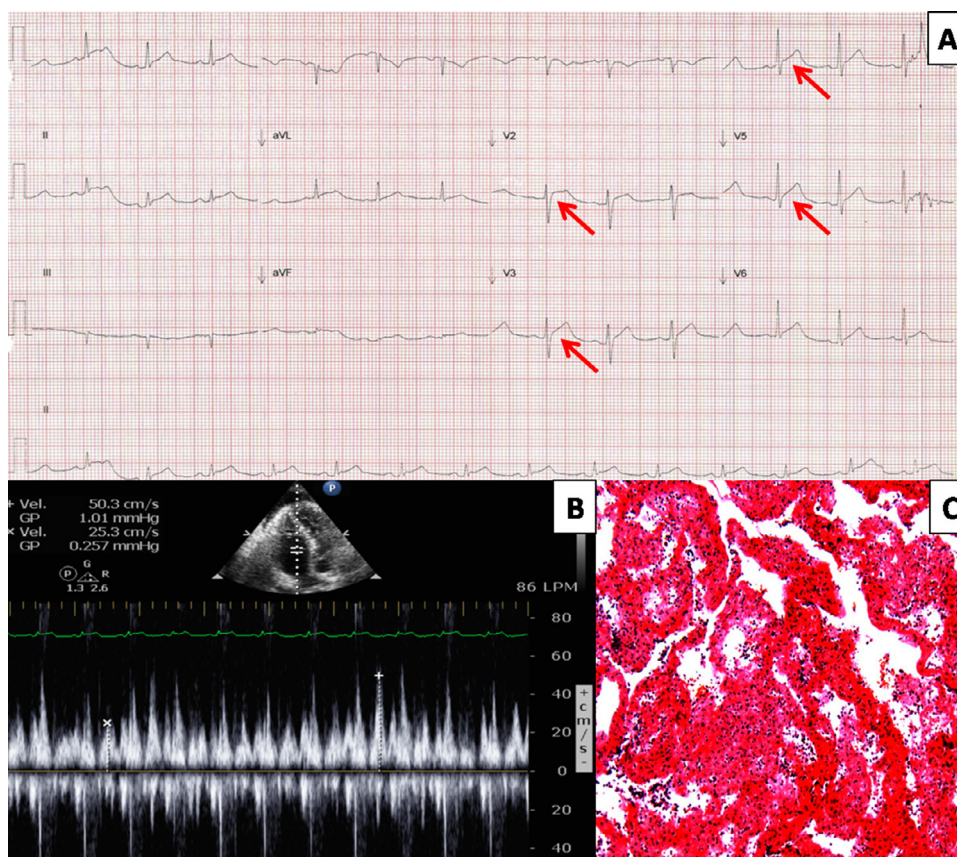


Figure 1. (A) Results of a 12-lead electrocardiogram: the red arrows show the presence of diffuse ST-segment elevation in the precordial leads. (B) Transthoracic echocardiogram results: A 4-chamber view with pulse-wave Doppler shows increased respiratory variation of tricuspid inflow, an echocardiographic sign of cardiac tamponade. (C) Microscopic analysis showed pericardial thrombus, fibrin, and inflammatory cells suggestive of acute pericarditis.

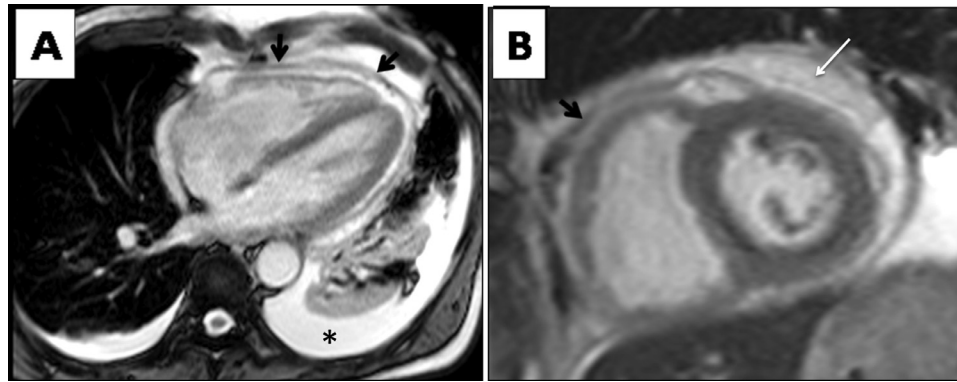


Figure 2. Cardiac magnetic resonance imaging results show (A) 4-chamber view indicating a steady-state free precession sequence with pericardial thickening (arrowheads) and pleural effusion (star). (B) Short-axis view shows inversion-recovery sequence indicating pericardial effusion (white arrow) and thickening (black arrowhead).

Based on the medical history, physical examination, laboratory analysis, and the 12-lead electrocardiogram findings, a case of acute pericarditis with high-risk factors was diagnosed. A transthoracic echocardiogram was mandatory to confirm what was suspected based on clinical evidence. The 2015 European Society of Cardiology (ESC) guidelines for pericardial diseases suggest hospitalization for patients with high-risk data, and drainage in cases with cardiac tamponade in which samples must be obtained for microbiological and microscopic analysis to increase diagnostic accuracy.² The isolation of *C. fetus* served as an accurate guide for the medical treatment, resulting in adequate clinical response.

CMR is a useful imaging method to evaluate the characteristics of the pericardium, the intensity of the pericardial fluid signal, the affected areas of the myocardium, and left ventricular function. In this patient, CMR showed mid-myocardial and pericardial late gadolinium enhancement with normal left ventricular ejection fraction, supporting the diagnosis of myopericarditis. The sensitivity and specificity of CMR as a diagnostic method are 86% and 95%, respectively.¹ The CMR was performed after the drainage of the complex effusion, due to the clinical emergency of the cardiac tamponade.

In conclusion, we present a case of an extremely rare occurrence of myopericarditis due to *C. fetus* complicated with pericardial tamponade. This case highlights the importance of a good clinical examination, and the fact that adequate cardiac imaging tools and a microbiological approach are mandatory in all high-risk cases of suspected pericardial disease, with the aim of identifying specific etiologies, so that accurate treatment can be provided, avoiding further complications and relapse.

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Disclosures

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Supplementary Material

To access the supplementary material accompanying this article, visit *CJC Open* at <https://www.cjcopen.ca/> and at doi:10.1016/j.cjco.2021.04.016.