# Acute pericardial effusion with tamponade due to *Coxiella burnetti* infection in end renal disease: A case report

Ana Rita Ramos[1], Filipa Trigo[1], Marisa Roldão[1], Inês Duarte[2], Rita Valério Alves[2], Ivan Luz[2], Paulo Santos[3]

[1]Internal Medicine Resident in Nephrology. Nephrology Department. Centro Hospitalar Médio Tejo – Torres Novas. Portugal.

[2]Nephrology Assistant. Nephrology Department. Centro Hospitalar Médio Tejo – Torres Novas. Portugal.

[3]Nephrologist Assistant and Director of the Nephrology Department. Nephrology Department. Centro Hospitalar Médio Tejo – Torres Novas. Portugal.

NefroPlus 2024;16(1):97-99



## ABSTRACT

Q fever is a worldwide zoonosis caused by *Coxiella burnetii,* characterized by clinical polymorphism. Pericarditis associated Q fever is reported in around 1% of cases, and when left untreated it can progress to tamponade, a life-threatening condition rarely described. Diagnosis hinges on a heightened antiphase II IgG antibody titer, with tetracyclines being the favored treatment. Presenting a case involving a 27-year-old Algerian man admitted to a Nephrology Department for end-stage renal disease requiring urgent hemodialysis. Fever accompanied by blood test results indicating mild leukocytosis, left deviation, and increased C-reactive protein levels. An echocardiogram unveiled a massive pericardial effusion with right atrial bulging, and an urgent pericardiocentesis was performed. Serological studies showed positive IgG titers to *C. burnetii* and doxycycline treatment was initiated with positive outcomes. In conclusion, Q fever, resulting from *C. burnetii,* links to contact with infected animals or unpasteurized milk. Recognition of the patient's epidemiological context proves pivotal. In Portugal, shifting migration patterns underscore the importance of considering uncommon diagnoses. This case emphasizes the challenges in diagnosing Q fever, particularly in chronic renal disease patients, stressing the importance of a comprehensive approach for accurate diagnosis and effective treatment.

**Key words:** Q fever. Pericarditis with tamponade. End-stage renal disease.

## INTRODUCTION

Q fever is a zoonotic disease caused by *Coxiella burnetii*, and is transmitted through inhalation of infected aerosols, typically associated with direct or indirect contact with infected animals, or by ingestion of unpasteurized milk from infected animals[1]. It is usually divided into acute and chronic forms. Acute infection can be asymptomatic or manifest as an influenza-like illness, atypical or rapidly progressive pneumonia, acute hepatitis, and aseptic meningitis. Chronic Q fever occurs through spontaneous evolution lasting six months in patients with immunocompromising condition or with cardiovascular abnormalities. It may cause vascular and bone-infections, chronic pulmonary fibrosis and chronic hepatitis[2,3].

Both forms of Q fever can cause pericarditis, a rare condition due to the nonspecific presentation of *C. burnetii* infection, resulting in an underestimated incidence. Diagnostic can be established through positive blood culture, PCR detection of *C. burnetii* DNA or serologic tests[4]. Occurring to Portuguese Guidelines, a high antiphase II IgG antibody titer ≥200, antiphase II IgM ≥50 and/or a four-fold increase in antiphase II IgG titer make the diagnosis. The most effective treatment for adults is doxycycline (100 mg every 12 hours) for 14 days. For adults with risk factors that could lead to persistent disease (such as cardiovascular abnormalities, aortic aneurysm or prosthesis/graft in vascular territory), treatment involves doxycycline plus hydroxychloroquine (600 mg/daily). A clinical, analytical, and serological reassessment should be conducted after 3 to 6 months

**Corresponding author: Ana Rita Ramos**
Nephrology Department.
Centro Hospitalar Médio Tejo.
Rua Xanana Gusmão 45. 2350-754 Torres Novas. Portugal

*Revisión por expertos bajo la responsabilidad de la Sociedad Española de Nefrología.*

to confirm cure or assess the persistent infection. If the anti-phase I IgG antibody titer is <800, further evaluation is unnecessary[3,4].

Hereby, we present a case report of a young man with end-stage renal disease, acute pericarditis and cardiac tamponed.

## CASE REPORT

A 27-year-old man from Algeria, a farmer who has been living in Portugal for a year with no history of kidney disease or other medical conditions, was admitted to the hospital due to fatigue, asthenia, anorexia, nausea, and lower limbs' edema with one month's duration. He also complained of fever without any other mentioned symptoms during the medical history interview. Analytically tests revealed leukocytosis (15.0 x /L with neutrophils 13.2%) and high C-reactive protein (20.90 mg/dL). Blood and urine cultures were negative, and imaging exams did not show any infectious focus. We were started on piperacillin with tazobactam (4.5 g every 12 hours) for fever without a clear source, which resulted in a normalization of temperature and decreasing inflammatory parameters (leukocytes 7.51 x /L, C-reactive protein 7.91 mg/dL).

From a renal perspective, he presented with elevated in nitrogen retention urea (427 mg/dL) and serum creatinine (22.3 mg/dL), and imaging exams revealed atrophic kidneys without signs of urinary tract obstruction. Considering these findings, he was diagnosed with end-stage renal disease and urgently started hemodialysis via a central venous catheter in the right jugular vein, which was tunneled posteriorly.

On the seventh day of hospitalization, he developed fever again, along with dry cough, myalgia, and fatigue. Blood test showed mild leukocytosis (13.44 x /L with neutrophils 84.9%) and increased C-reactive protein levels (9.19 mg/dL). Vancomycin (1 g every 42 hours) and ceftazidime (2 g every 42 hours) were administered presuming a catheter infection. Blood and urine cultures, as well as serologic testing for zoonosis infections (*C. burnetii, Leptospira, Brucella, Echinococcus, Borrelia, Rickettsia, Bartonella, Chlamydia, Toxoplasma, Cytomegalovirus, Epstein-Barr virus*) and *Plasmodium* were collected. A chest X-ray revealed perihilar reinforcement, and abdomen ultrasound showed hepatomegaly.

On the eight day, he continued to have a fever and developed hypotension (90/68 mmHg) and tachycardia (108 bpm) once again. Cardiac auscultation revealed decreased, rhythmic, and regular heart sounds without audible murmurs. Due to the suspicion of an unfocused infection, an echocardiogram was performed, revealing a massive pericardial effusion with right atrial bulging (as shown in figures 1 and 2). An urgent pericardiocentesis was performed, draining 1050 ml of serohematic pericardial fluid.

The results of the zoonotic infection tests came back on the 15th day of hospitalization. Up until that point, the patient continued to have a fever despite being on vancomycin and ceftazidime. Serological studies revealed positive IgG phase II titers to *C. burnetii* (1/512) and based on these results, Doxycycline treatment was initiated (100 mg every 12 hours). Within five days, the fever subsided, and both the blood tests and echocardiogram abnormalities normalized. Ten days after the diagnosis, the patient was discharged due to improvement in his overall condition. Following his hospital discharge, the patient was lost to follow-up, and there was no clinical or laboratory reassessment.

## DISCUSSION

As mentioned previously, Q fever is a global zoonosis caused by *Coxiella burnetii,* typically associated with direct or indirect contact with infected animals or the ingestion of unpasteurized milk[3,4]. Therefore, understanding the patient's epidemiological context is crucial for accurate diagnosis. Given the changing migration patterns in Portugal, it becomes increasingly important to consider diagnoses rarely encountered in our country.

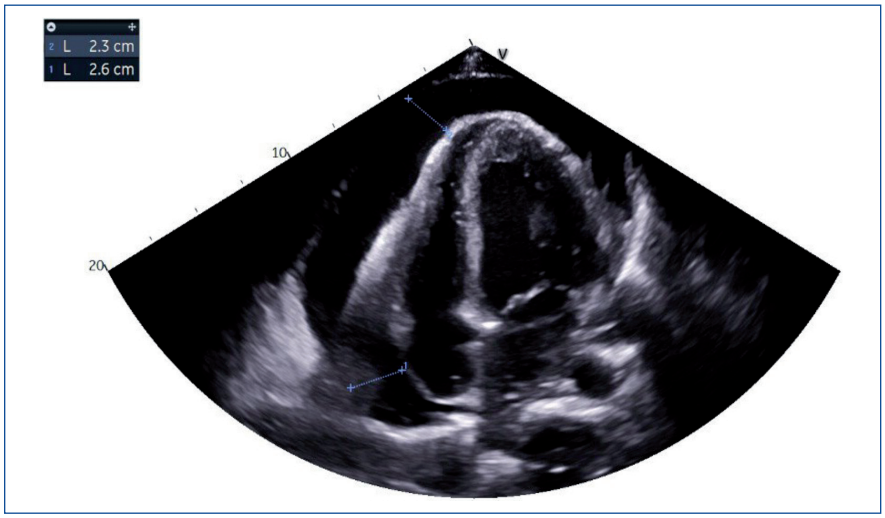


**Figure 1. Echocardiogram showing pericardial effusion.**

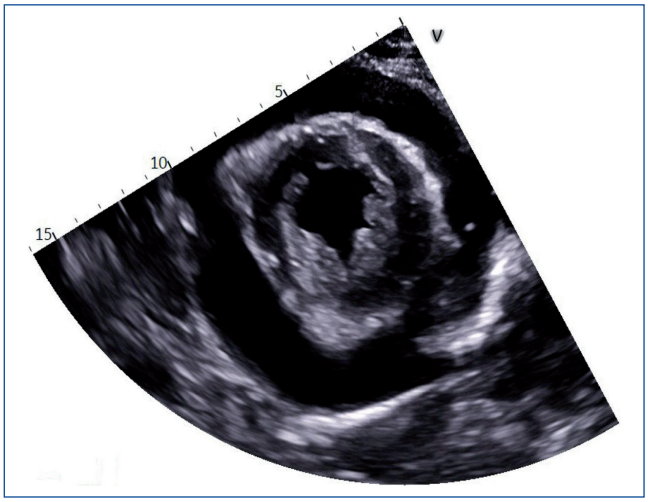


**Figure 2.** **Echocardiogram showing pericardial effusion.**

In its acute form, Q fever commonly presents as a nonspecific febrile illness characterized by high-grade fever, headache, fatigue, and myalgias[4]. Consequently, the incidence of *C. burnetii* pericarditis is likely underestimated. This rarity as a cause of infectious pericarditis, especially with tamponade, underscores the diagnostic and therapeutic challenges, especially in patients with end-stage renal disease, as illustrated in this case.

Due to the nonspecific symptoms and diverse clinical presentations, along with varying disease severity, it is essential to consider Q fever as a differential diagnosis for non-specific febrile illnesses, particularly in patients with a suggestive epidemiological context. This consideration is even more critical in individuals with chronic renal disease and those who are immunosuppressed, as their clinical presentations can be more diverse and severe.

While immunosuppressed patients are more susceptible to chronicity in Q fever, this particular case demonstrated the effectiveness of treatment after clinical and analytical reassessment.

In summary, Q fever is a global zoonosis that requires a high index of suspicion for accurate diagnosis. This case underscores the significance of considering Q fever in the differential diagnosis of unexplained fever in patients with chronic renal disease. Without a comprehensive approach, this rare condition could have had fatal consequences for the patient.

### Disclosure of potential conflicts of interest

None declared.

### Ethical standards

The study was conducted according to the principles of the Declaration of Helsinki.

### Informed consent

Written informed consent was obtained from the patient for the publication of this case report.

## REFERENCES

1. Esteban-Zubero E, Alatorre-Jimenez MA, Marin-Medina A, Villeda-Gonzalez R, Lopez-Garcia CA, Gomez-Ramos JJ. Acute Pericarditis due to Coxiella burnetiid infection, a case report. Health and Primary Care. 2018;2. https://doi.org/10.15761/hpc.1000130.
2. Levy P-Y, Carrieri P, Raoult D. Coxiella burnetii pericarditis: Report of 15 cases and review. Clin Infect Dis. 1999;29:393-7. doi: 10.1086/520221.
3. A guide to Q fever and Q fever vaccination. Available at: https://www.qfeverfacts.com.au/wp-content/uploads/2021/06/Q-Fever-Facts-A-Concise-Guide-to-Q-fever-and-Q-fever-Vaccination.pdf
4. Nunes-Silva C, Rocha R, Martins A, Ribeiro L, Nuak J, Tavares M, et al. Guidelines for the Treatment and Follow-Up of Patients with Q Fever. Acta Med Port. 2022;35:494–503. https://doi.org/10.20344/amp.18007.