EJCRIM
European Journal
of Case Reports
in Internal Medicine

A CASE OF POLYSEROSITIS WITH PERICARDITIS CAUSED BY *MYCOBACTERIUM SPP.*

Filipa Figueiredo, Teresa Valido, Jéssica Oliveira, Carolina Chumbo, Joana Batista Paulo, Garcieth Gomes, Marta Rocha

Department of Internal Medicine, Medicine III Prof. Doutor Fernando Fonseca Hospital, Amadora, Portugal

Corresponding author's e-mail: filipa.figueiredo@ulsasi.min-saude.pt

Received: 25/05/2025
Accepted: 03/06/2025
Published: 24/06/2025

Conflicts of Interests: The Authors declare that there are no competing interests.
Patient Consent: Written informed consent for publication was obtained from the patient.
This article is licensed under a Commons Attribution Non-Commercial 4.0 License

How to cite this article: Figueiredo F, Valido T, Oliveira J, Chumbo C, Batista Paulo J, Gomes G, Rocha M. A case of polyserositis with pericarditis caused by Mycobacterium spp. *EJCRIM* 2025;**12**:doi:10.12890/2025_005548

ABSTRACT

The incidence of diseases and deaths caused by non-tuberculous mycobacteria (NTM) has been increasing globally. However, the broad and nonspecific clinical manifestations of NTM infections make diagnosis challenging, compounded by the difficulty in isolating NTM organisms. While NTM are rarely associated with heart disease, including pericarditis, and pleural effusion, such presentations are exceptional.

We report the case of an 85-year-old female who presented with polyserositis, characterized by pleural and pericardial effusion, and was diagnosed with an unusual manifestation of NTM infection causing pericarditis. Initially, the patient was misdiagnosed with tuberculosis, which delayed the correct diagnosis and appropriate treatment. Upon accurate diagnosis, her condition improved with adjustments to the treatment regimen.

This case highlights the importance of considering NTM infection in the differential diagnosis, particularly when faced with atypical presentations. Early recognition and timely microbiological testing are crucial for accurate diagnosis, enabling targeted treatment and improving patient outcomes.

KEYWORDS

Non-tuberculous mycobacterial, pericarditis, pericardial effusion, pleural effusion

LEARNING POINTS

- Non-tuberculous mycobacteria infection can have non-specific presentations such as weight loss and night sweats, which are similar to lymphomas and tuberculosis.
- Unusual presentations of non-tuberculous mycobacteria infection, such as pleural effusions and pericarditis, can occur.
- Diagnosis is needed to ensure the correct treatment and may require polymerase chain reaction testing.

INTRODUCTION/BACKGROUND

Non-tuberculous mycobacteria (NTM), a group within the *Mycobacterium* genus that also includes *Mycobacterium tuberculosis* and *Mycobacterium leprae*[1], comprises over 190 species[2]. First described in the nineteenth century[1], NTM are ubiquitous, free-living environmental organisms. They

EFIM
European Federation of Internal Medicine

Publisher
smc media srl

can be divided into fast-growing and slow-growing types[1] and are commonly found in natural water sources such as rivers, lakes, and streams, as well as in drinking water systems, soil, household dust[3], animals (domestic and wild), and food[4].

Historically, NTM were considered non-pathogenic, affecting primarily individuals with preexisting structural lung disease or those who are immunosuppressed[1]. However, the global incidence of NTM infections and related deaths has risen, now affecting both immunocompromised and immunocompetent individuals[1]. This increase is likely due to factors such as aging populations, the rise in immunocompromised conditions, and improvements in diagnostic techniques[5]. NTM infections are concerning due to their increasing antibiotic resistance and the potential for person-to-person transmission. The disease burden is significant in both children and adults, with well-documented direct and indirect morbidity[1].

NTM infections are typically acquired through environmental exposure via ingestion, inhalation, or dermal contact, with activities like drinking, bathing, and gardening serving as common points of exposure. Inhalation is the primary route for lung disease, as these bacteria are easily aerosolized[3]. The *Mycobacterium avium* complex (MAC) is the most common cause of human infection, though other species, such as *M. xenopi*, *M. fortuitum*, *M. kansasii*, and *M. abscessus*, are also frequently isolated[1].

Most NTM infections are nonspecific, with pulmonary infections being the most common manifestation (about 90% of cases)[6]. Other common sites of infection include lymph nodes[6], skin, bones, and soft tissues. In immunocompromised individuals, disseminated infections can occur[2,6]. Diagnosing NTM infections is challenging due to the difficulty of isolating the organisms and the fact that their mere identification does not necessarily confirm an active infection[2]. NTM are resilient organisms, capable of surviving in diverse environmental conditions, resisting antibiotics and disinfectants, and proving difficult to culture. These characteristics contribute to their widespread distribution and frequent underdiagnosis, complicating treatment and often leading to unnoticed infections[1].

This case report presents an unusual manifestation of NTM infection, involving polyserositis and pericarditis. It illustrates the diagnostic challenges associated with NTM infections and underscores the impact of misdiagnosis on patient prognosis. The report aims to raise awareness among healthcare professionals about these atypical manifestations, emphasizing the importance of considering NTM in the differential diagnosis to improve patient outcomes.

CASE DESCRIPTION

An 85-year-old woman with no significant medical history was referred to the emergency department immediately after the onset of dry cough, dyspnoea, fever, and tachycardia. The patient had also experienced epigastric pain, vomiting, and diarrhoea the previous day, though these had resolved by the time of presentation.



Figure 1. Computed tomography scan of the chest with pericardial and bilateral pleural effusion.

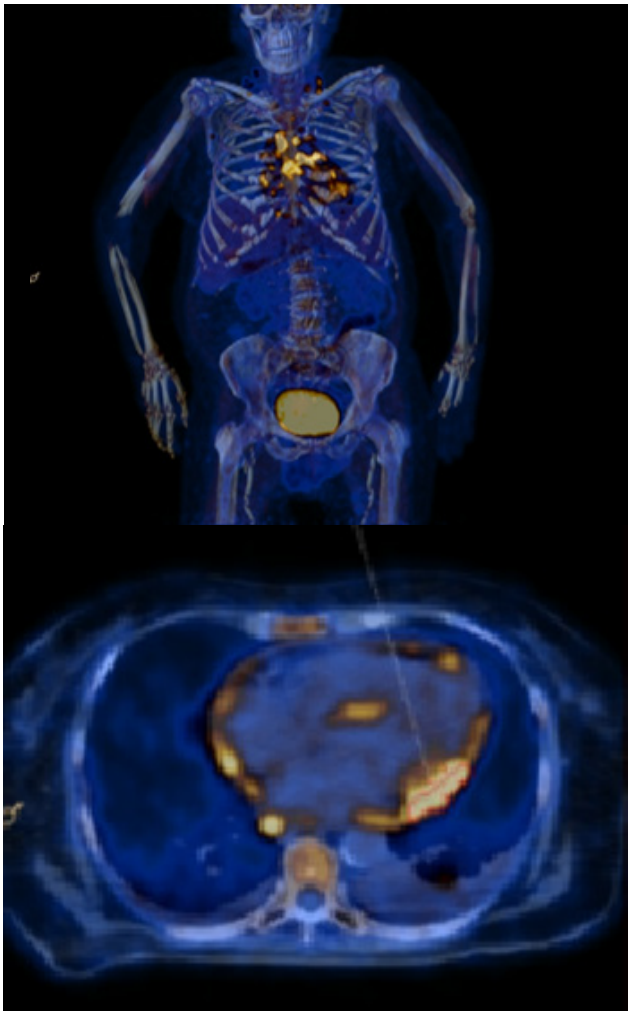


Figure 2. Positron emission tomography (PET) scan with uptake in the pericardium, mediastinal, and supraclavicular lymph nodes.

Physical examination revealed tenderness on palpation of the right flank and iliac fossa, along with right costovertebral angle tenderness, but no other significant findings.

Blood tests revealed macrocytic anaemia, leucocytosis with neutrophilia, elevated C-reactive protein, and signs

of acute renal injury. Urinalysis showed leukocyturia and erythrocyturia. Abdominopelvic computed tomography (CT) scan was performed, ruling out kidney stones and hydronephrosis, but revealing pericardial effusion and mild bilateral pleural effusion. Based on the initial presentation, acute pyelonephritis was suspected, and empirical antibiotic therapy was started after urine cultures were collected. However, given the finding of polyserositis, further investigation was warranted, and the patient was admitted to the Internal Medicine department.

A more detailed clinical history revealed xerostomia, xerophthalmia, unquantified weight loss, and night sweats. The patient's erythrocyte sedimentation rate was notably elevated at 80 mm/h. To further investigate the chest imaging, a CT scan of the chest was performed *(Fig. 1)*, which confirmed pericardial and bilateral pleural effusion and also showed prominent lymphadenopathy throughout the mediastinal compartments. Despite the initial diagnosis of acute pyelonephritis, urine cultures were negative, and blood cultures were also negative. After 7 days of empirical antibiotic treatment, the patient showed mild improvement in inflammatory markers but continued to experience daily fever spikes, primarily in the afternoon.

Further investigations aimed at excluding infectious, neoplastic, and autoimmune diseases included thoracentesis, which revealed exudative pleural fluid with 921 nucleated cells/µl, predominantly lymphocytes (63.6%). However, microbiological cultures, acid-fast bacilli testing, anti-SSA antibodies, and rheumatoid factor were all negative. An endobronchial ultrasound-guided lymph node biopsy was performed, but no neoplastic cells or acid-fast bacilli were found. Upper gastrointestinal endoscopy and total colonoscopy also revealed no evidence of malignancy. Infections including human immunodeficiency virus (HIV), hepatitis B and C, cytomegalovirus, and coxsackievirus were excluded.

Echocardiograms, both transthoracic and transoesophageal, showed no signs of endocarditis, including vegetations or abscesses. Autoimmune studies ruled out diagnoses such as sicca syndrome, rheumatoid arthritis, mixed connective tissue disease, and systemic lupus erythematosus. The only abnormal finding was a positive antinuclear antibody (ANA) at a titre of 1/160, with no other significant results.

A positron emission tomography (PET) scan *(Fig. 2)* showed intense uptake in the pericardium, mediastinal, and supraclavicular lymph nodes. Based on these findings, an excisional biopsy of the supraclavicular lymph node was performed. Histological analysis of the lymph node revealed necrotizing granulomatous lymphadenitis with multinucleated giant cells and a few acid-fast bacilli, consistent with Mycobacterium spp. This led to the diagnosis of ganglionic tuberculosis (TB) with tuberculous pericarditis. In response, the patient was started on a standard anti-tuberculosis regimen consisting of isoniazid, rifampin, pyrazinamide, and ethambutol, along with corticosteroid therapy for the pericarditis.

Subsequent testing at the Dr. Ricardo Jorge National Institute of Health confirmed the presence of NTM through positive polymerase chain reaction (PCR) results. Following consultation with the Infectious Diseases department, the patient's treatment was adjusted to include rifabutin, ethambutol, levofloxacin, and clarithromycin for atypical mycobacterial infection.

After treatment was initiated, the patient's fever subsided, and her condition began to improve.

DISCUSSION

Due to a combination of genetic, environmental, and healthcare system factors, the prevalence of NTM infections is rising worldwide, particularly in North America, Japan, and some regions of Europe[7,8]. NTM infections are more common in certain groups, particularly in immunocompromised patients, such as those with HIV/acquired immunodeficiency syndrome, organ transplant recipients, or those receiving immunosuppressive medication. Patients with chronic lung diseases such as chronic obstructive pulmonary disease, bronchiectasis, or cystic fibrosis are also more susceptible, as these conditions create an environment that favours bacterial growth. Furthermore, as seen in this case, the elderly are also vulnerable due to age-related immune system decline and comorbidities[8]. Slender, tall, immunocompetent women from 50 to 80 years old also appear to be at risk. This might be because of the decreased of oestrogen that occurs in menopause, or abnormalities in fibrillin expression[7]. Moreover, the damage and impairment of natural pulmonary defence mechanisms induced by smoking also increases the risk. Additionally, genetic factors may also play a role in susceptibility[8].

NTM infections represent a diagnostic challenge as the symptoms are non-specific[2]. This is particularly pronounced when the infections involve uncommon sites, such as the pleura and pericardium[9,10]. Pericarditis and pleural effusion, in particular, are rare manifestations of NTM infections, even in immunocompromised individuals[6,11], making the presentation in this case all the more unusual.

Due to their similar clinical and histological characteristics, NTM and TB pleuritis are also challenging to distinguish[12]. Elevated adenosine deaminase levels and lymphocyte-dominant exudates in pleural fluid are possible signs of both[11]. Microbiological confirmation is still the most important diagnostic factor[11,12]. However, because of their environmental ubiquity and the possibility of contamination in biological samples, NTM organisms are particularly difficult to isolate[2]. Diagnosis often requires a correlation of clinical manifestations with radiographic findings, followed by microbiological confirmation[2]. Radiological findings include bronchiectasis, pulmonary nodules, infiltrates, or cavities. High-resolution computed tomography (HRCT) helps to identify the characteristic abnormalities associated with NTM infections, making it particularly useful for diagnosing these infections[8]. In cases of non-pulmonary NTM infections, identifying the source for cultures depends

on the location of infection. Blood cultures can be useful in confirming the diagnosis of disseminated NTM disease[2]. Imaging was important in this instance because it showed pericardial and pleural effusions, which prompted additional diagnostic testing. Excisional biopsy was used to confirm the diagnosis of NTM, and the results showed necrotizing granulomatous lymphadenitis with acid-fast bacilli. This case highlights the importance of advanced imaging techniques, such as HRCT, and underscores the need for high clinical suspicion when diagnosing rare infections.

The treatment of NTM infections is complicated by the great genetic variability of NTM strains, impeding a standardized treatment regimen. It usually requires a multidrug regimen, which generally includes ethambutol, rifampicin, and a macrolide such as clarithromycin or azithromycin. Treatment usually extends for up to 12 months following a negative sputum culture. However, relapse or reinfection can be seen in up to 60% of patients within the first year after completing their initial treatment[7]. Management is made even more difficult by the requirement for multidrug regimens, lengthy treatment courses, and the negative effects of these drugs. Furthermore, it is still unclear what the best medication combinations, dosages, and course of treatment are for a large number of NTM infections[2].

Multidisciplinary cooperation is necessary for efficient diagnosis and treatment of NTM infections due to their complexity. Infectious disease specialists, radiologists, and microbiologists all play vital roles in guaranteeing precise diagnosis and suitable treatment.

CONCLUSION

This case highlights the importance of early recognition of NTM infections, particularly in patients presenting with atypical findings such as pleural and pericardial effusions. It underscores the need for a tailored approach to treatment, with careful monitoring for drug-related side effects and relapse. Given the complexity of NTM infections, ongoing research into strain variability, treatment regimens, and diagnostic advancements will be crucial for improving patient outcomes.

REFERENCES

1. Ratnatunga CN, Lutzky VP, Kupz A, Doolan DL, Reid DW, Field M, et al. The Rise of Non-Tuberculosis Mycobacterial Lung Disease. *Front Immunol* 2020;**11**:303. doi: 10.3389/fimmu.2020.00303
2. Pennington KM, Vu A, Challener D, Rivera CG, Shweta FNU, Zeuli JD, et al. Approach to the diagnosis and treatment of non-tuberculous mycobacterial disease. *J Clin Tuberc Other Mycobact Dis* 2021;**24**:100244. doi: 10.1016/j.jctube.2021.100244
3. Jeon D. Infection Source and Epidemiology of Nontuberculous Mycobacterial Lung Disease. *Tuberc Respir Dis (Seoul)* 2019;**82**:94-101. doi: 10.4046/trd.2018.0026
4. Sarmento e Castro RS, Vasconcelos O, Horta AA, Rodrigues F, Pereira MF, Rocha-Marques A. Infecções por micobactérias atípicas [Atypical mycobacteria infections]. *Acta Med Port* 1999;**12**:371-379.
5. Naito M, Maekura T, Kurahara Y, Tahara M, Ikegami N, Kimura Y, et al. Clinical Features of Nontuberculous Mycobacterial Pleurisy: A Review of 12 Cases. *Intern Med* 2018;**57**:13-16. doi: 10.2169/internalmedicine.9119-17
6. Bachar K, Shulimzon T, Segel MJ. Nontuberculous mycobacteria infections of the pleura: A systematic review. *Respir Med* 2022;**205**:107036. doi: 10.1016/j.rmed.2022.107036
7. Conyers LE, Saunders BM. Treatment for non-tuberculous mycobacteria: challenges and prospects. *Front Microbiol* 2024;**15**:1394220. doi: 10.3389/fmicb.2024.1394220
8. Bhanushali J, Jadhav U, Ghewade B, Wagh P. Unveiling the Clinical Diversity in Nontuberculous Mycobacteria (NTM) Infections: A Comprehensive Review. *Cureus* 2023;**15**:e48270. doi: 10.7759/cureus.48270
9. Jinah R, Ryan T, Sibbald M. A Case of Pericarditis and Pericardial Masses Associated With Mycobacterium Paragordonae. *Clin Med Insights Cardiol* 2023;**17**:11795468231189039. doi: 10.1177/11795468231189039
10. Giordani AS, De Gaspari M, Baritussio A, Rizzo S, Carturan E, Basso C, et al. A rare cause of effusive-constrictive pericarditis. *ESC Heart Fail* 2021;**8**:4313-4317. doi: 10.1002/ehf2.13470
11. Park S, Jo KW, Lee SD, Kim WS, Shim TS. Clinical characteristics and treatment outcomes of pleural effusions in patients with nontuberculous mycobacterial disease. *Respir Med* 2017;**133**:36-41. doi: 10.1016/j.rmed.2017.11.005
12. Furuuchi K, Morimoto K, Fujiwara K, Tanaka Y, Takemura T, Kurashima A, et al. Mycobacterium avium Complex Pleuritis with Elevated Anti-glycopeptidolipid-core IgA Antibody Levels in Pleural Effusion. *Intern Med* 2019;**58**:2577-2579. doi: 10.2169/internalmedicine.2751-19