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Acinetobacter Lwofii, an unusual cause of infectious pericarditis complicated with cardiac tamponade: a case report

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Abstract

Bacterial pericarditis can be considered a rare pathology, usually associated with cardiac procedures and, to a lesser extent, with immunosuppression and chronic diseases. The importance of its knowledge lies in the fact that mortality can reach up to 100% in untreated patients. Once diagnosed, pericardiocentesis and administration of intravenous antimicrobial therapy are mandatory for the prevention of its complications, which include cardiac tamponade and sepsis. Here we present an exceptional case of infectious pericarditis due to Acinetobacter Lwoffii in an older adult, which was complicated by pericardial effusion and cardiac tamponade.

Key word: pericarditis, acinetobacter lwoffii, dyspnea, cardiac tamponade.

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Introduction

Inflammation of the pericardial membrane, known as pericarditis, is the most common form within the spectrum of pericardial diseases. Although there is no clear data on its epidemiology, an Italian cohort study reports an incidence of 27.7 cases per 100,000 person-years(1). It accounts for 5% of emergency department admissions for non-ischemic chest pain in the United States(2). It can be due to multiple infectious and non-infectious causes; within the non-infectious causes, autoimmune and neoplastic etiology are the most frequent, with 24% and 9%, respectively(3). It is estimated that only 14% of the cases are due to microorganisms, and more than 50% represent viral etiology. Bacterial etiology is responsible for less than 10% of the cases(4). Diagnosis is based on specific clinical and paraclinical criteria. These should be established early since their delay directly impacts the prognosis of these patients, which, even with adequate treatment, can lead to fatality in up to 40% of cases, mainly due to cardiac tamponade, toxicity, or constriction.(5) Early diagnosis and treatment are important prognostic factors for these patients. Methodology: A literature search was performed in databases such as MEDLINE, PubMed, Scopus, and Elsevier from 1977 to October 1, 2022, using the terms Mesh (bacterial pericarditis) and (Acinetobacter), finding 2 case reports to date, which highlights the importance of this case given the peculiarity of the isolation in the context of a patient without immunocompromise or recent cardiac procedure.

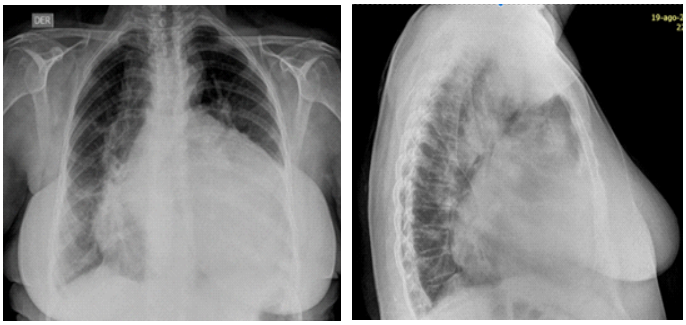
Case report

A 72-year-old woman with a history of chronic heart failure with preserved ejection fraction, permanent atrial fibrillation, hereditary hemorrhagic telangiectasia, and bronchial asthma, with no occupational, toxic or traumatic history, consulted for a clinical picture of two months of evolution consisting of dyspnea on moderate exertion, which increases with supine position, and progresses in the last week prior to admission to dyspnea at rest, associated with lower limb edema, paroxysmal nocturnal dyspnea, and bendopnea. In the review by systems, she denies the associated symptoms. On physical examination, she presents with grade II jugular venous distension at 45 degrees. Low-pitched arrhythmic heart sounds without murmurs, bibasal pulmonary rales, and mild ascending symmetrical pitting edema in the lower limbs. Paraclinical findings included hypochromic microcytic anemia, WHO III and mild hypervolemic iso-osmolar hypochloremia, chest X-ray with cardiomegaly, signs of air trapping, flow cephalization and interstitial involvement (Figure 1). Management was initiated for decompensated heart failure and a transthoracic echocardiogram was performed, reporting moderate to severe pericardial effusion of approximately 700 cc with data of hemodynamic repercussion with signs of tamponade, LVEF of 65% , no right ventricular dysfunction, no spontaneous

contrast, no masses inside, no images compatible with vegetations, no abscesses and left pleural effusion

Figure 1

Chest X-ray showing loss of the left pulmonary base and cardiomegaly



Given the above, she was transferred to the intensive care unit, and a sample was taken by aspiration and sent for cytology, culture, and pericardial sample. Given the hemodynamic instability that required vasoactive support and mechanical ventilation, the infection was screened with a set of blood cultures and a chest CT scan (Figure 2) in which a left basal pneumonic process with bilateral pleural effusion was documented. Empirical antibiotics with meropenem/vancomycin were performed, with a report 48 hours after admission of negative blood cultures and pericardial fluid culture on blood agar medium positive for ACINETOBACTER LWOFFII/HAEMOLYTICUS identified by mass spectrometry (MALDI TOF) sensitive to sulbactam and meropenem, evaluated by the infectious service, which ruled out a viral, tuberculous and neoplastic cause based on tumor markers and negative images, so it was decided to prolong antibiotic therapy with meropenem for 21 days. During her stay, she evolved towards improvement, with transfer to the ward and subsequent discharge.

Figure 2

Chest tomography shows an area of consolidation with left base bronchogram, bilateral pleural effusion, and cardiomegaly with pericardial effusion

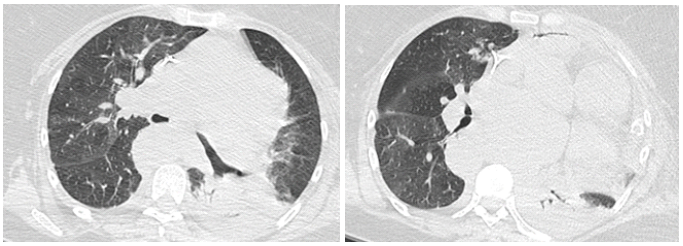


Table 1

Infectious parameters report

Parameter infectious profile.	Report	Reference value
Blood cultures 1 and 2	Negative after 5 days of incubation	Negative
Culture for mycobacteria (Sample: Pericardial fluid)	Negative	Negative
RT-PCR for Mycobacterium Tuberculosis (GeneXpert)- Sample: Pericardial fluid	Not detected	Detection limit for Identification 1 CFU Detection limit for Resistance 6 CFU
Pericardial fluid culture: Acinetobacter Lwoffii/Haemolyticus (Antibiogram)		
amikacin	Sensitive	<=8
Ampicillin Sulbactam	Sensitive	<=4/2
Cefepime	Sensitive	4
Ceftazidime	Sensitive	4
ceftriaxone	Sensitive	two
Ciprofloxacin	Sensitive	0.25
Gentamicin	Sensitive	<=2
Imipenem	Sensitive	0.5
Meropenem	Sensitive	<=0.5
Piperacillin-Tazobactam	Sensitive	<=4/4
trimethoprim-sulfamethoxazole	Sensitive	<=1/19
Cytology and cytochemistry of pericardial fluid		
Color before centrifugation	Yellow	
Color after spinning	Yellow	
Appearance before centrifuging	Cloudy	
Appearance after centrifugation	Transparent blood bud is observed.	
liquid pH	9	
Density	1,015	
Glucose	151.6	
Total proteins	5.38	
Lactic dehydrogenase	4.37	
cell button		Leukocytes: 3 Neutrophils: 0
amine adenosine (ADA)	8.3	>= 50 IU/L
red blood cell count	1425	Fresh: 90, Crenate: 10
Pathological study of the pericardium		
Pericardial biopsy	Fibroconnective tissue and mesothelial lining without atypia	

Discussion

Pericarditis is an inflammatory syndrome of the pericardium whose causes are broad and include infectious, autoimmune, inflammatory, neoplastic, radiation-induced, congenital, and idiopathic processes (2). It can be classified as acute, chronic (> 3 months), which circumscribes effusive, adhesive, and constrictive forms, and recurrent, which encompasses intermittent and incessant forms (4). From the clinical point of view, pericarditis can cover a wide spectrum ranging from the total absence of symptoms to a marked hemodynamic compromise with a fatal outcome without this heterogeneity being attributable to its etiology.

In approximately 90% of symptomatic cases, chest pain is the most frequent reason for consultation, usually retrosternal, radiating to the shoulder and neck and intensifying with inspiration, swallowing and supine decubitus. (6) Dyspnea, cough, and nausea may be present as associated symptoms. The classic finding on physical examination is pericardial friction rub, a rasping noise heard with maximal intensity in the mesocardium and left parasternal border. It is heard in up to 60% of cases, but its absence does not rule out the diagnosis. When pericarditis presents with significant effusion, signs of cardiac tamponade, such as jugular venous distension, muffled heart sounds, and paradoxical pulse, may appear. Although the pericardium is electrically silent, up to 80% of patients present with electrocardiographic abnormalities: in the early stages, there is diffuse ST-segment elevation with superior concavity, later this segment normalizes, and there may be T-wave flattening and PR-segment depression. In the case of associated effusions, there may be electrical alternation and decreased voltage of the QRS complex; within the arrhythmias, sinus tachycardia is the most frequent finding. (6) At least 2 of the 4 proposed criteria are required for diagnosis (7):

1. chest pain
2. pericardial rub
3. electrocardiographic changes
4. New pericardial effusion or worsening of a previous effusion.

In terms of etiology, idiopathic pericarditis leads most cohorts and may be related to difficulties in establishing a specific diagnosis(8). It is considered that thanks to the antibiotic era, less than 10% of pericarditis are caused by bacteria, and Gram-positive germs are the most commonly isolated(6,9). A series published in 2015, which included 320 patients, reported that the most commonly associated microorganisms are: S. Epidermidis (60%), S. Aureus (22%), S. Haemolyticus (6%), Streptococcus spp. (3%), Pseudomonas aeruginosa (3%), and Acinetobacter baumanii (3%) (9,10). These data coincide with other cohorts in which germs such as Acinetobacter spp. are considered exceptional causes of pericarditis and pericardial effusion (5,7).

Acinetobacter lwoffii is a gram-negative, aerobic, non-fermenting bacillus that appears to belong to the normal flora of the oropharynx and skin, especially in moist areas such as the axillae, groin, and interdigital area in up to 25% of the healthy population (11) and has also been identified in the hospital environment despite the efforts of various societies to limit the incidence of nosocomial infections, especially in intensive care units. The most frequent sites of infection are the bloodstream (43.4%), urinary tract (20.2%), and respiratory tract (11.3%); as for pericardial infections, two anecdotal cases published in 1997 and 2019 have been documented to date, both with isolation of Acinectobacter baumanii(12,13); A. lwoffii and A. junii have been associated with less severe but increasingly infrequent infections. Pericardial infections by this germ have been associated primarily with dental procedures, cardiac surgery, intravenous drug use, burns, and prolonged use of intravascular devices. (14)

As for therapy, pericardial drainage, and intravenous antibiotic treatment, the germ isolated in this case did not show unusual resistance mechanisms despite being in what is known as the post-antibiotic era. These strains usually respond to treatment with carbapenems, alone or in combination with aminoglycosides. (15), Screening for intravenous drug sensitivity is essential for targeted therapy. Nonsteroidal anti-inflammatory drugs are helpful for symptom improvement and are maintained for 1-2 weeks and may be extended if symptom control is not present. Rest and careful monitoring for changes suggestive of hemodynamic compromise are essential for follow-up. (5,6)

Conclusion

Pericarditis is inflammation of the pericardial membrane and may or may not be complicated by pericardial effusion. Its etiology is varied, and bacterial infections represent less than 10% of the total. The presentation associated with Acinetobacter infection is an extremely rare cause of infectious pericarditis, and, to date, this would be the first reported case with isolation of Acinetobacter lwoffii. The importance of pericardiocentesis for microbiological isolation and the possibility of targeted therapy is highlighted, which allowed a better therapeutic approach and a good outcome for this patient.

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Conflicts of interest

All authors declare no conflict of interest for this article.

Ethics

For the presentation of this clinical case, the request and signature of the informed consent by the patient was made.

Authors contribution

The authors confirm their contribution to the paper as follows: study conception and design: María Clara Ospino Guerra, Dinno Fernández Chica; data collection: Jessica Ospino Guzmán, Esteban Morales Díaz; analysis and interpretation of results: Dinno Fernández Chica, Esteban Morales Díaz; draft manuscript preparation: María Clara Ospino Guerra, Jessica Ospino Guzmán. All authors reviewed the results and approved the final version of the manuscript. All authors agree to be responsible for all aspects of the work to ensure the accuracy and integrity of the published manuscript.

References

1. Imazio M, Gaita F. Acute and Recurrent Pericarditis. Cardiol Clin. 2017 Nov 1;35(4):505–13.
2. Lewinter MM, Cremer PC, Klein AL. Pericardial Diseases.Twelveth E. Braunwald's Heart Disease, 2 Vol Set. Elsevier Inc.; 2022. p. 1615–1634
3. Imazio M, Gaita F, LeWinter M. Evaluation and treatment of pericarditis: A systematic review. JAMA - J Am Med Assoc. 2015;314(14):1498–506.
4. Maisnh B, Seferovic P, Ristic A, Erbel R, Adler Y, Tomkowski W, et al.Clinical Practice Guide for the diagnosis and treatment of diseases of the pericardium. Short version. Spanish Rev Cardiol. 2004;57(11):1090–114.
5. Pankuweit S, Ristić AD, Seferović PM, Maisch B. Bacterial pericarditis: Diagnosis and management. Am J Cardiovasc Drugs. 2005;5(2):103–12.
6. Knowlton KU, Narezkina A, Savoia MC, Oxman MN. Myocarditis and pericarditis.Nineth Ed. Mandell, Douglas, and Bennett. Infectious diseases. Principles and practice. Elsevier Spain, SLU; 2019. p. 1110–1124
7. Chiabrando J, Bonaventura A, Vecchié A. Management of Acute and Recurrent Pericarditis: JACC State-of-the-Art Review. J Am Coll Cardiol. 2020;75(1):76–92.
8. Gouriet F, Levy PY, Casalta JP, Zandotti C, Collart F, Lepidi H, et al. Etiology of Pericarditis in a Prospective Cohort of 1162 Cases. Am J Med. 2015 Jul;128(7):784.e1-8.
9. Sotoudeh M, Kianinejad R, Ali M, Arzhan S, Jalali A. Bacterial pericarditis and antimicrobial resistance at the Tehran Heart Center, Iran. J Infect Dev Ctries. 2015;9(7):780–4.
10. Cherrabi K, Ouattassi N, Tinni O, Kamal D, Elalami MN. Necrotizing descending mediastinitis by Acinetobacter Baumannii in an out-patient: a case report. Egypt J Otolaryngol. 2021;37(1).
11. Regalado NG, Martin G, Antony SJ. Acinetobacter lwoffii: Bacteremia associated with acute gastroenteritis. Travel Med Infect Dis. 2009;7(5):316–7.
12. Liu J, Xiao X, Cen C, Yuan H, Yang M. Rare purulent pericarditis caused by carbapenem-resistant Acinetobacter baumannii: A case report. Med (United States). 2019;98(38):38–41.
13. Lam S, Huang T. Report Acinetobacter pericarditis with tamponade in systemic lupus erythematosus. Lupus. 1997;6:480–3.
14. Bergogne-Bérézin E. Acinetobacter infections: Unusual infection sites. Antibiotics. 2008;10(2):81–7.
15. Mittal S, Sharma M, Yadav A, Bala K, Chaudhary U. Acinetobacter lwoffii an emerging pathogen in neonatal ICU.Infect Disorder Drug Targets. 2015;15(3):184–8.