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Bubbles in the Pericardium

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
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Conflict of interest: None declared

Patient: Male, 22
Final Diagnosis: Purulent pericardial effusion with tamponade
Symptoms: Chest pain • short of breath
Medication: None
Clinical Procedure: Pericardial drainage
Specialty: Cardiology

Objective: Rare disease
Background: Purulent pericarditis is a rare but life-threatening illness. Often, it may be masked by the primary infectious etiology like pneumonia, endocarditis, or CNS infection, leading to a delay in diagnosis and treatment. Echocardiography is the modality of choice for estimating the presence and size of pericardial effusion and detecting presence of tamponade.
Case Report: We present a case of a young man with acute respiratory illness in whom clinical exam, electrocardiography, and classic echocardiographic findings played a key role in diagnosis. An echo-dense effusion (rather than echo-free space) appearing like “bubbles” within the pericardial space was seen and a purulent nature of the fluid was strongly suspected. Prompt institution of antimicrobial therapy and timely pericardial drainage resulted in complete clinical recovery of the patient.
Conclusions: In this case, timely diagnosis and prompt treatment of effusion with pericardial drainage and antibiotics resulted in complete recovery from this otherwise devastating infection.

MeSH Keywords: Cardiac Tamponade • Pericardial Effusion • Pericardial Window Techniques

Full-text PDF: <http://www.amjcaserep.com/abstract/index/idArt/893877>

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Background

Purulent Pericarditis is an uncommon disease which can be a devastating illness. Timely diagnosis requires strong clinical suspicion and prompt cardiac workup with electrocardiogram and transthoracic echocardiography followed by confirmation of diagnosis with pericardial fluid cultures. Treatment involves timely pericardial drainage and antibiotics. We present a case of a young man in whom timely diagnosis and management of this life threatening condition allowed for complete recovery. Several novel echocardiographic findings of this disease are also described and demonstrated.

Case Report

A 22-year-old man presented to the emergency department (ED) with a 2-week history of generalized malaise, nausea, vomiting, and cough productive of yellow phlegm. He was diagnosed with a viral syndrome with superimposed community-acquired pneumonia and discharged with a prescription of oral antibiotics. He presented to the ED 5 days later with severe central chest pain getting worse in a lying down position and slightly better with sitting. On physical examination, temperature was 101.6°F, respiratory rate 30 breaths per minute, pulse regular at 130 beats per minute, blood pressure 104/64 mm Hg, and oxygen saturation 92% while he was on 4 liters/minute oxygen via nasal cannula. Pericardial rub was noted at the left lower sternal border. Neck veins were distended, heart sounds were soft, and pulsus paradoxus was present. Examination of the lung revealed bronchial breath sounds and rhonchi in the right lower lobe. The white-cell count was 30,000 per cubic millimeter with 21% bands. Chest X-ray showed right middle and lower zone infiltrates consistent with pneumonia, and interval enlargement in cardiac silhouette. A 12-lead electrocardiogram (Figure 1) showed sinus tachycardia at 115 beats per minute, diffuse concave up ST-segment elevation, diffuse PR-segment depression, and PR-segment elevation in lead aVR. Two sets of blood cultures were drawn, sputum culture was obtained, and empiric broad spectrum intravenous (IV) antibiotics

were started. Community-acquired pneumonia complicated by acute pericarditis was diagnosed and an urgent transthoracic echocardiogram (TTE) was obtained due to strong clinical suspicion of cardiac tamponade.

TTE showed a large circumferential pericardial effusion with right ventricular free wall collapse during early diastole (Figures 2, 3, Video 1) and septal bounce (Video 2). Unlike usual pericardial effusion which appears as an echo-free space, this one had an appearance of mobile echo-dense granules or “bubbles” within the pericardial space (Video 3). Diagnosis of purulent pericarditis with cardiac tamponade was made. Pericardial window was performed and approximately 200 cc of purulent pericardial fluid was removed. Sputum and pericardial fluid cultures grew Gram-positive cocci identified as Beta-hemolytic Group G streptococci. Blood cultures as well as HIV and influenza workup were negative. Over the next few days, improvement in hemodynamic and respiratory status was noted with resolution of fever. IV antibiotic regime was de-escalated and transitioned to oral therapy at the time of discharge.

Discussion

Purulent pericarditis is an uncommon disease. Often, it may be masked by the primary infectious etiology, like pneumonia, endocarditis, or CNS infection, leading to a delay in diagnosis and treatment. Worsening septic shock and cardiac tamponade are dreaded complications if diagnosis is delayed. In the pre-antibiotic era, most cases had a primary identifiable infectious disease, such as pneumonia, endocarditis, CNS, or bone infections [1]. In the antibiotic era, many patients with purulent pericarditis have a preexisting pericardial disease due to conditions such as uremia, tumor, or collagen vascular disease. Alcohol abuse, pre-existing immunosuppression, and chest trauma are other risk factors [2]. *Staphylococcus aureus* is the most commonly identified pathogen. Rare cases of purulent pericarditis caused by Group G streptococcus have been reported.

Figure 1. Initial 12-lead electrocardiogram showing sinus tachycardia at 115 beats per minute, diffuse concave up ST-segment elevation, diffuse PR-segment depression, and PR-segment elevation in lead aVR, changes consistent with pericarditis.

Figure 2. Transthoracic echocardiogram (TTE) image of the parasternal short axis view at level of mitral valve showing pericardial effusion with right ventricular free-wall buckling during diastole (arrow).

Figure 3. TTE image of M-mode across the short axis view at the level of mitral valve showing collapse of RV free-wall during early diastole (arrow), a finding consistent with tamponade physiology.

Video 1. TTE Video of Parasternal short axis view at level of mitral valve showing pericardial effusion with right ventricular free-wall collapse during diastole, consistent with tamponade.

Video 2. TTE Video of 4 chamber apical view showing “septal bounce” which is a brisk, early diastolic septal motion toward the LV during inspiration, followed by a rebound in the opposite direction during expiration, and reflects exaggerated interventricular dependence.

TTE is the modality of choice in evaluating the presence and size of pericardial effusion and cardiac tamponade. Occasionally, in cases of purulent pericarditis, loculation or compartmentalization of effusion may be noted as opposed to free-flowing

circumferential fluid collections. The diagnosis of purulent pericarditis is established by pericardial fluid culture and microscopy. The treatment involves pericardial drainage and antibiotics [3]. Most patients with purulent pericarditis are critically

Video 3. TTE video of subcostal view showing mobile echodense granular effusion in pericardial space as opposed to usual echo-free space noted with most pericardial effusion.

References:

1. Klacsmann PG, Bulkley BH, Hutchins GM: The changed spectrum of purulent pericarditis: an 86 year autopsy experience in 200 patients. *Am J Med*, 1977; 63(5): 666–73
2. Maisch B, Seferović PM, Ristić AD et al: Guidelines on the diagnosis and management of pericardial diseases executive summary; The Task force on the diagnosis and management of pericardial diseases of the European society of cardiology. *Eur Heart J*, 2004; 25(7): 587–610
3. Rubin RH, Moellering RC Jr: Clinical, microbiologic and therapeutic aspects of purulent pericarditis. *Am J Med*, 1975; 59(1): 68–78
4. Sagristà-Sauleda J, Barrabés JA, Permanyer-Miralda G, Soler-Soler J: Purulent pericarditis: review of a 20-year experience in a general hospital. *J Am Coll Cardiol*, 1993; 22(6): 1661–65

ill and broad-spectrum empiric antibiotic coverage should be started [4].

Conclusions

The rapid clinical deterioration with development of sepsis, and classic clinical and ECG findings of pericarditis helped suggest purulent pericarditis in our case. Subsequent work-up with TTE and pericardial window confirmed the diagnosis. In this case, timely diagnosis and prompt treatment of effusion with pericardial drainage and antibiotics resulted in complete recovery from this otherwise devastating infection.

Statement

No disclosures or conflicts of interest.