CLINICAL VIGNETTE

An Unusual Case of Purulent Pericarditis

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Clinical Scenario

A 39-year-old man no significant medical history presented to the hospital with two weeks of fevers, anorexia, nausea, and vomiting associated with diffuse aches and central back pain. His exam was remarkable for tachycardia and intermittent fevers, with the remainder of his exam unremarkable. Initial labs were significant for leukocytosis of 26.9 thousand/uL with 74% neutrophils and 10% immature bands. Chemistries included elevated hepatic enzymes, with ALT of 125 Units/L, AST of 89 Units/L, and alkaline phosphatase of 511 Units/L with normal bilirubin. The procalcitonin was markedly elevated at 244.75 ng/mL as were inflammatory markers ferritin (3600ng/mL), ESR (60mm), D-dimer (16.95 ug/mL), and C-reactive protein (18.09 mg/dL).

Despite a compelling clinical picture of an infectious process, blood cultures did not grow any organisms and chest radiography was unremarkable. The patient did not wish to remain in the hospital and left against medical advice.

Three months later the patient returned to the hospital with chest pain and dyspnea at rest. The pain worsened with exertion for several days and was associated with shoulder pain. Vitals were remarkable for a heart rate of 152bpm, and a blood pressure of 103/70mmHg. His exam revealed significantly elevated jugular venous pressure, respiratory distress with splinted breathing and crackles in the right base with decreased breath sounds. CT scan showed a large (18.7 x 12 x 10.3cm), heterogeneous cystic mass with contrast enhancement originating from the left liver lobe abutting the pericardium with associated 2 cm pericardial effusion, concerning for an abscess and infectious pericardial effusion.

Fluids and broad-spectrum antibiotics were administered and given the clinical diagnosis of cardiac tamponade, the patient was taken for emergent pericardiocentesis. Almost 500 mL of purulent material was aspirated, and a drain was left to allow continued drainage. Fluid analysis revealed a leukocyte count of 159,756 cells/mm^2 with 90% neutrophils and no detectable glucose. Fluid gram stain revealed gram-negative rods with culture eventually speciated to a pan sensitive Escherichia coli. Interventional radiology placed a percutaneous drain into the abdominal abscess with initial drainage of a liter of purulent material which also grew the same E. coli as the pericardium.

Antibiotics were narrowed to ceftriaxone and the patient improved clinically over several days. However, the pericardial drain became clogged with the thick purulent material and he was taken for a subxiphoid pericardial window by cardiothoracic surgery. The pericardium was noted to be significantly thickened with multiple loculations of purulent material which were mechanically taken down and the pericardial space thoroughly washed out.

The patient continued to improve and was discharged on a four-week course of levofloxacin.

Discussion

Purulent pericarditis is rare since the development of antibiotics but has substantial morbidity and mortality and requires a high index of suspicion.[1] While this patient showed signs of tamponade including significant tachycardia, relative hypotension and elevated neck veins, others may simply present with fevers and leukocytosis. Chest pain is not always present, and the EKG and chest radiograph may be normal as the effusion may not be large enough to cause initial symptoms. Primary infection of the pericardial space is rare and limited to post-surgical manipulation of the pericardial space. Other pericardial infections are secondary to other primary infections. Reported routes include contiguous spread from a pleural or mediastinal source or from an intracardiac infection such as endocarditis, hematogenous seeding, and from a subdiaphragmatic suppurative lesion.[2] In this patient, the abutting liver abscess directly seeded the pericardium with the same organism despite negative blood cultures. Most cases of purulent pericarditis in the antibiotic era are gram positive bacteria, fungi, and tuberculosis.[3] Gram negative infections are rare and usually associated with a subdiaphragmatic source.[4] It is important that broad spectrum antibiotics, and potentially antifungals, be administered until the causative organism is isolated. Important patient factors include whether the host is immunocompromised, has an existing known source of infection, or has undergone recent thoracic instrumentation.

Cross sectional imaging such as CT can be helpful for the diagnosis, although echocardiogram is the gold standard for an effusion and can also assess hemodynamic effects.[5] Immediate drainage is required to prevent or alleviate tamponade and can provide fluid for culture to optimize antimicrobial coverage.

This can be performed through a subxiphoid pericardial window. Given the emergent initial presentation and possible hemodynamic compromise, pericardiocentesis is generally performed first. Echocardiogram guidance during drainage is also invaluable to perform a safe procedure and to ensure complete drainage of the material as loculations and septations may have formed. The drain may need to be repositioned or additional wires and catheters used to try and break through septation. In almost all cases, surgical drainage and washout is needed to ensure complete evacuation of all purulent material and to disrupt any adhesions that have formed to prevent persistent purulent pericarditis and constrictive pericarditis.[1,2] There has been revived interest in intrapericardial fibrinolytics to help ensure complete drainage of material and prevent constriction. While a pericardiotomy can ensure this, it is a morbid procedure and a subxiphoid window may not allow complete exploration of the pericardium. Instilling fibrinolytics into the pericardial space and allowing them to dwell with delayed drainage has been reported in several series.[2] Although there is a risk of adverse medication reaction, pain, and bleeding, these were reported to be rare. Rarely, non-surgical treatment with fibrinolytics and antibiotics has been used to manage purulent pericarditis when the risk of surgical treatment was felt to be too high.[5,6]

Our patient underwent subxiphoid pericardial window. The surgeon felt he could clear all material from the pericardium and remove all adhesions, which was confirmed with echo-cardiogram. After the resolution of the acute infection, patients need to be monitored for recurrent purulent pericarditis and constrictive pericarditis. While constrictive pericarditis is uncommon after idiopathic or viral pericarditis, it is much more common after purulent pericarditis.[7] Symptoms include dyspnea on exertion, abdominal distension, and lower extremity edema. Examination may show unexplained jugular distension and a rise in the jugular venous pressure with inspiration. Diagnosis can be made from echocardiogram, cardiac CT, or cardiac MRI. Unfortunately, our patient was lost to follow-up and we do not have long-term follow-up.

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