

Constrictive Pericarditis and Multi-Systemic Challenges in a Septic Patient with a Complex Medical History: A Case Report

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INTRODUCTION

Constrictive pericarditis, characterized by a fibrotic and often calcified pericardium encasing the heart, is a rare yet significant cardiac condition, accounting for less than 0.2% of all cardiovascular hospital admissions. It occurs in about 9% of people with acute pericarditis. The condition arises from a chronic inflammatory process leading to pericardial thickening, which can be triggered by various factors, ranging from idiopathic origins to viral infections, post-cardiac surgery complications, radiation therapy, connective tissue disorders, or tuberculosis, especially in endemic areas. Worldwide, the leading cause of constrictive pericarditis is tuberculosis, with about 50% of patients with tuberculous pericardial effusion developing the condition despite antitubercular therapy. In developed nations, the predominant causes are idiopathic or post-viral infection, with these causes accounting for 40% to 60% of total cases.

The clinical presentation of constrictive pericarditis poses a diagnostic challenge due to its similarity with other conditions such as restrictive cardiomyopathy, cardiac tamponade, right heart failure, and chronic pulmonary diseases. Distinguishing constrictive pericarditis from these conditions is crucial, as it directly impacts treatment decisions. Diagnostic confirmation often relies on imaging modalities like echocardiography, CT, or MRI, which reveal the characteristic thickened and calcified pericardium.

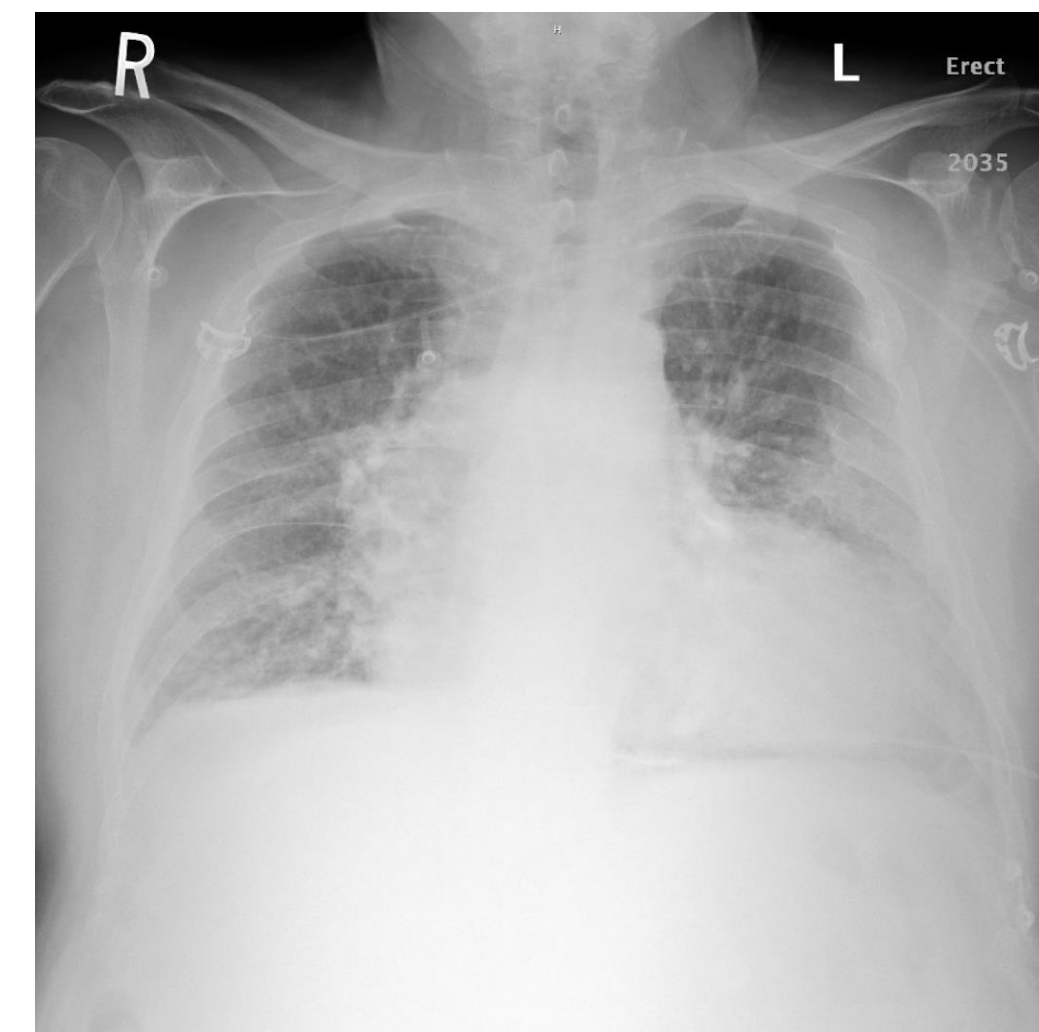
CASE PRESENTATION

A 70-year-old male with diabetes and hypertension was admitted to the emergency department displaying symptoms of encephalopathy and shortness of breath. Upon examination, he showed signs of severe distress including hypertension, tachycardia, tachypnea, and lung crackles, indicative of underlying heart issues and potential infection. Laboratory tests revealed leukocytosis and elevated BNP levels, suggesting heart failure, while imaging showed cardiomegaly and lung congestion. Notably, signs of possible cellulitis were observed on his right lower extremity, and his condition was complicated by both hypotension and fever.

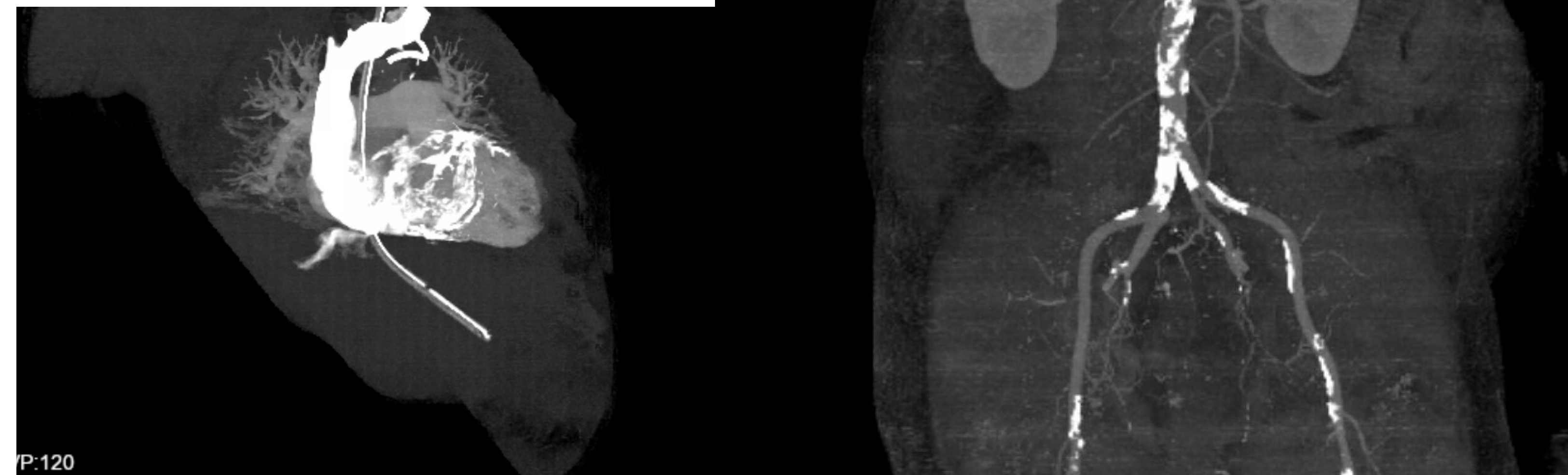
As his condition worsened, marked by acute hypoxic respiratory failure, the patient required intubation and mechanical ventilation. He was treated aggressively with a septic bolus and broad-spectrum antibiotics aimed at addressing suspected meningitis or another CNS infection as suggested by his high fevers. Imaging and further tests revealed multiple complications including pericardial calcifications and effusions, indicative of more severe underlying cardiac issues, possibly constrictive pericarditis. Despite these interventions, his congestive heart failure exacerbated, necessitating the use of diuretics and fluid management to stabilize his condition.

Throughout his hospital stay, the patient's complex condition required multidisciplinary management, involving neurology and infectious disease consultations alongside continuous cardiac monitoring. His mental status fluctuated, initially presenting with confusion and progressing to agitation, managed with antipyretics and cooling measures for suspected meningitis. Gradually, his condition improved, allowing for the cessation of intravenous diuretics in favor of oral options and the initiation of antidepressants to address concurrent depression. Upon discharge, he was scheduled for outpatient follow-up to monitor his heart condition, particularly to assess the progression of pericardial calcifications and potential constrictive pericarditis.

TREATMENT & FOLLOW-UP



Initial Chest X Ray showing vascular congestion



CTA chest/abd/pel showing significant pericardial calcification

LEARNING POINTS

- Early Recognition and Symptoms:** Recognizing early symptoms and distinguishing constrictive pericarditis from other causes of heart failure is critical. Common signs include elevated jugular venous pressure, Kussmaul's sign, and specific echocardiographic findings like septal bounce and pericardial thickening. Understanding these can guide prompt and accurate diagnosis.
- Pathophysiological Insights:** Understanding the pathophysiology of constrictive pericarditis is vital for effective management. The disease process involves a chronic inflammation leading to fibrosis and calcification of the pericardium, impeding normal cardiac filling and function. This distinct pathophysiology affects both diagnostic strategies and therapeutic approaches.
- Importance of Comprehensive Diagnostic Evaluation:** Echocardiography is fundamental in diagnosing constrictive pericarditis, but the integration of CT and MRI can provide crucial details about pericardial thickness and calcification. Additionally, right heart catheterization might be necessary to confirm the diagnosis by demonstrating hemodynamic patterns characteristic of constrictive pericarditis.
- Surgical and Medical Treatment Options:** While pericardiectomy is the definitive treatment for relieving the restrictive heart condition, it carries significant risks, especially in patients with extensive comorbidities. Medical management, including anti-inflammatory medications and diuretics, plays a crucial role in managing symptoms and is particularly important for patients who are not candidates for surgery.
- Long-term Follow-up and Prognosis:** Regular follow-up using echocardiography is essential for monitoring disease progression and managing potential complications. The prognosis varies depending on the underlying cause, with idiopathic cases generally having a better outcome compared to those caused by radiation therapy or associated with severe comorbidities.

DISCUSSION

The case of a 70-year-old male with a history of diabetes and hypertension, who presented with acute hypoxic respiratory failure and was subsequently diagnosed with constrictive pericarditis, underscores the diagnostic and management challenges of this complex cardiac condition. Constrictive pericarditis, marked by fibrous thickening and calcification of the pericardium, restricts normal heart filling and mimics other cardiac conditions such as restrictive cardiomyopathy and cardiac tamponade. The diagnosis necessitates a comprehensive approach using echocardiography to observe hemodynamic function and septal bounce, supplemented by CT and MRI for detailed imaging of the pericardial thickness and calcifications. These imaging techniques, along with hemodynamic studies such as right heart catheterization, are essential to confirm the presence of constrictive physiology and to guide appropriate treatment plans.

Management of this condition demands a collaborative, multidisciplinary approach involving cardiologists, cardiothoracic surgeons, and radiologists, who collectively determine the most suitable intervention based on the severity of the disease and the patient's overall health status. The decision between surgical pericardiectomy and conservative medical management hinges on various factors including the patient's comorbidities and the extent of pericardial calcification. Pericardiectomy, while being the definitive treatment, poses significant risks and may not be viable for all patients, particularly those with extensive comorbidities. For patients not suited for surgery, managing symptoms with diuretics and anti-inflammatory medications becomes crucial to improving quality of life and managing heart failure symptoms.

The prognosis of constrictive pericarditis varies significantly based on its etiology and the timeliness of intervention. Early and accurate diagnosis is crucial for managing the disease effectively and can lead to improved outcomes. However, delayed diagnosis or misdiagnosis can lead to severe complications, underscoring the importance of vigilant monitoring and follow-up. This case exemplifies the need for heightened awareness and expertise in diagnosing and managing constrictive pericarditis, ensuring that patients receive tailored treatment strategies that address both the immediate symptoms and the underlying causes of the disease.

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