

Pericardial Empyema Resulting in Cardiac Tamponade In A Young Male With Bruton's Agammaglobulinemia

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Introduction

- Purulent pericarditis is defined as a localized infection of the pericardial space characterized by gross pus in the pericardium or microscopic purulence (>20 leukocytes per oil immersion field).
- Less than 7% of cases of pericardial effusion are due to an infectious cause, which is important to note, because purulent fluid is not synonymous with infection.
- Infectious purulent pericardial effusion is now a rare occurrence in developed countries, due to the widespread use of antibiotics, however, it was previously a common complication of pneumococcal pneumonia
- Infectious causes usually develop from the contiguous spread of an infection from the pleural cavity
- When present it is a life-threatening emergency, therefore, immediate diagnosis and intervention is required.

Clinical Case

The patient is a 28-year-old male with a past medical history significant for Bruton's Agammaglobulinemia and asthma. He presented to the hospital with a chief complaint of fatigue, chest pain and dyspnea which had been present for 3 days. The patient recently lost insurance and was non-compliant with scheduled IVIG injections. He reported about 2 episodes of pneumonia per year for the past 3 years, treated with antibiotics as an outpatient.

Hospital Course

Chest CT (image 2) and CXR (image 3) revealed pneumonia and a large pericardial effusion. Blood cultures collected and the patient was started on broad spectrum antibiotics and vasopressors for septic shock. EKG was notable for diffuse ST elevations (image 1) and he was taken for left heart catheterization (LHC) which revealed patent coronaries. Stat ECHO was also performed, and a pericardial effusion was noted and deemed to be small to moderate with no tamponade physiology. He was diagnosed with pericarditis and indomethacin and naproxen was initiated by the ED. The next morning, he developed severe respiratory distress, tachycardia and acute kidney injury. Vasopressor requirements increased. He was intubated to prevent airway compromise, after which his hemodynamics worsened. Tachycardia increased to the 140s and pulsus paradoxus witnessed on bedside telemetry. EKG was notable for diffuse ST elevations, low voltage and electrical alternans. An increased size of the pericardial effusion and impaired right ventricle filling was seen on bedside ultrasound and the patient was taken immediately for pericardiocentesis. 600mL of purulent pericardial fluid (image 5) with fibrin chunks was removed and sent for studies. A closed suction drain was left in place. In less than 10 hours the patient was weaned completely off pressor support. AKI resolved and heart rate was within normal range. He was extubated to nasal cannula. The patient developed increased work of breathing 2 days later after removal of the pericardial drain and stat ECHO and repeat Chest CT (image 6) ruled out re-accumulation of fluid and confirmed worsening pneumonia respectfully.

Decision Making

Although the patient's respiratory distress was likely due to pulmonary edema secondary to the tamponade, intubation was necessary for stabilization. Intubation and positive pressure ventilation, however, increases thoracic pressure which decreases venous return and cardiac output. With the patient already critically ill, prompt action was taken. The European Society of Cardiology Working Group on Myocardial and Pericardial Diseases scoring system aided in the decision to take the patient for emergent pericardiocentesis. According to the guidelines, suspected cardiac tamponade requires STAT ECHO. The patient is then scored according to disease etiology, clinical presentation, and findings on imaging. A score of 6 or more requires the patient to undergo immediate pericardial drainage while lower scores indicate drainage can be postponed for 12-48 hours. This patient had a score of 14 and was taken directly for intervention. A closed suction drain was left in place in this patient due to the fibrous chunks discovered in attempts to pull fluid that may be trapped. In addition to pericardiocentesis, the pericarditis, pneumococcal pneumonia and immunodeficiency was aggressively treated with colchicine, IVIG injection and high dose Rocephin.

Conclusion

This case highlights how rapidly patients with increased susceptibility to cardiac tamponade can decline and how important prompt diagnosis and treatment are to decreasing mortality. Treatment of the underlying etiology is just as important, as it plays a role in prevention.

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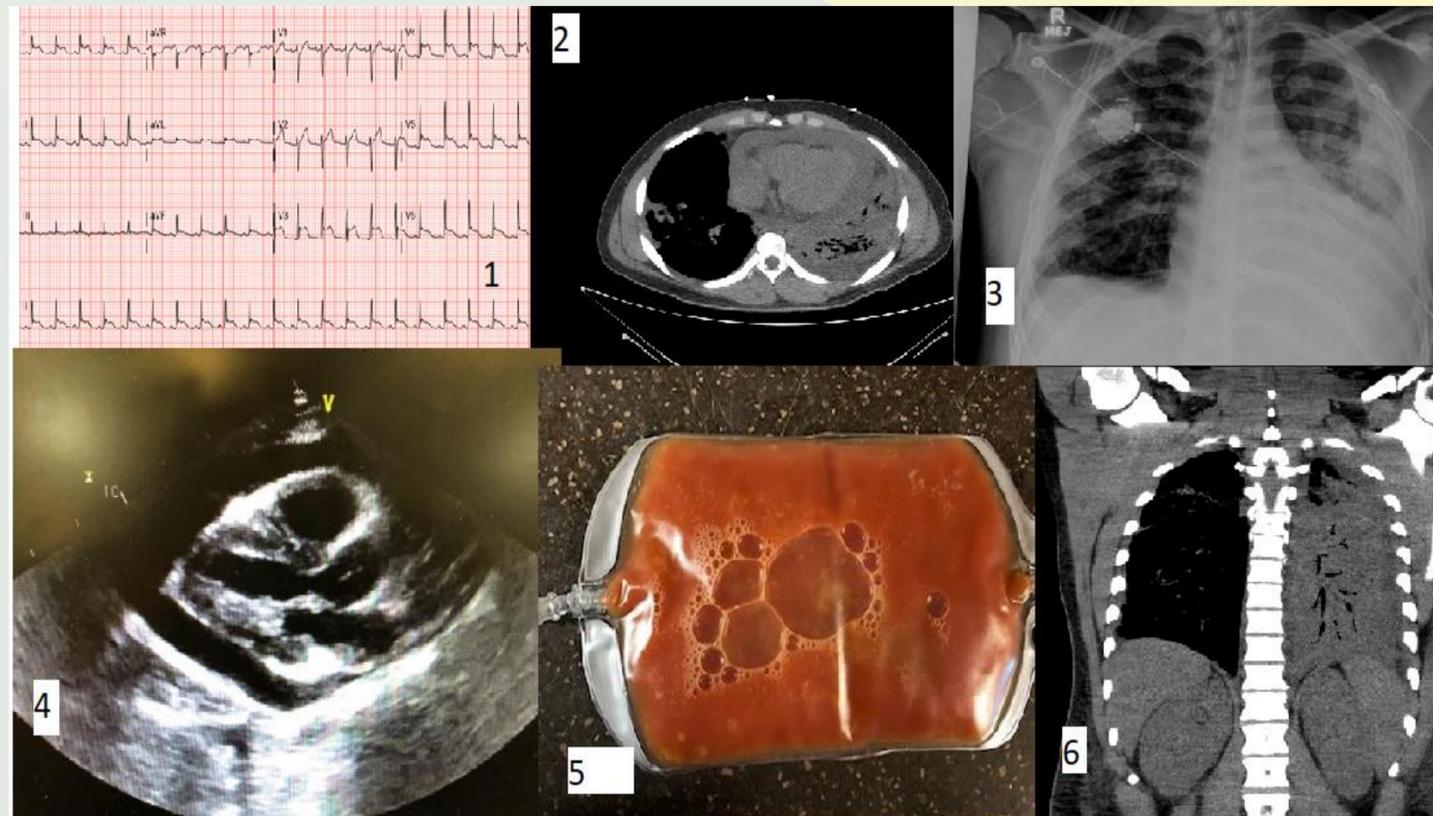


Figure 1: Initial EKG with diffuse ST elevation. Figure 2: Initial Chest CT revealing PNA and pericardial effusion. Figure 3: initial CXR with cardiomegaly and PNA. Figure 4: Pericardial effusion. Figure 5: Purulent Pericardial fluid with fibrin strands. Figure 6: Worsening PNA with air bronchogram