

Purulent Pericardial Effusion with Cardiac Tamponade in the Setting of MRSA Bacteremia on Treatment

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knowledge changing life



Introduction

- An estimated 80-90% of acute pericarditis is idiopathic
 - Largely thought to be due to viral etiologies^{1,2}
 - Other causes: bacterial, mycobacterial, fungal, neoplastic, autoimmune, and systemic inflammatory disorders
 - Bacterial causes represent <1% of cases
- Normally, the pericardial space contains a small amount of fluid
 - In cases of pericardial inflammation, increased amounts of fluid can develop
 - Rapid increase in fluid accumulation can lead to cardiac tamponade

Case – Initial Presentation

- 87 yo M with h/o T2DM, PVD s/p L BKA, pAF, HTN, and chronic unstageable sacral wounds with known ischial osteomyelitis
- Presentation: several weeks of drainage from RLE wounds with surrounding cellulitis and months of progressively worsening mobility
 - Superficial wound cultures obtained with MRSA and pseudomonas growth
 - Treated with 7 days of IV Vancomycin & cefepime for superficial infection
 - MRI deferred by patient, deemed poor surgical candidate by vascular & plastic surgery
 - Transferred to inpatient rehab floor for PT/OT/wound cares

Hospital Course

- 2 months into rehab stay, tested positive for COVID19 (Asymptomatic)
- 1 week later, ICU transfer for a fib with RVR, hypotension, and fevers
 - 2/2 blood cultures revealed MRSA bacteremia
 - Stabilized with amiodarone and vancomycin
 - Repeat blood cultures negative
- Transferred back to the floor after improvement in hemodynamics
- Three days later post initial transfer, patient developed acute hypotension and lethargy

Physical Exam & Labs

Vitals: afebrile, P90, BP 92/51, RR 25, 95% RA

General: A&Ox3, **however lethargic, appears uncomfortable.** Following commands

HEENT: Normocephalic, PERLA, EOMI, Normal neck ROM. Clear oropharynx.

Trachea midline.

Pulmonary: No adventitious breath sounds auscultated bilaterally including wheezes, rhonchi, rales, or crackles. Normal inspiratory and expiratory phase.

Cardiovascular: **irregular rhythm**, clear S1/S2. No S3/S4. **Pericardial rub present.** No murmurs or gallops. JVD difficult to assess 2/2 habitus

Gastrointestinal: Normoactive bowel sounds, soft, Non-tender to light and deep palpation.

Integumentary: **L BKA, R LE wrapped**, sacral wounds not visualized

Neurological: No focal CN deficits, no focal weakness

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AST – 248

ALT – 106

Alk phos – 78

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Lactate 1.7

Imaging

CT a/p – summary (salient results):

Solid organ evaluation limited without IV contrast and with artifacts. No evident retroperitoneal hematoma/hemorrhage at this time. Body wall edema.

Cardiomegaly, dense coronary calcifications, small to moderate size pericardial effusion. Partially seen moderate size pleural effusion

Imaging

TTE - Summary:

1. Hyperdynamic left ventricular systolic function. Left ventricular ejection fraction is estimated at 70 to 75%.
2. Unable to assess left ventricular diastolic function due to technical limitations.
3. **There is evidence of impaired RV filling and diastolic collapse consistent with tamponade.**
4. In the subcostal views the effusion measures 4.3 cm in its largest dimension.
5. **Large pericardial effusion, as described above.**
6. Doppler assessment of respirophasic variation in flow velocities is limited due to irregular cardiac rhythm.

Comparison to prior study: **The results of this study are significantly worse than the prior study. There is now a large circumferential pericardial effusion with cardiac tamponade.** Findings discussed with the Cardiology consult service and the interventional cardiology service.

Hospital Course

- Pericardiocentesis performed with 450cc serosanguinous fluid drained
 - 1+ MRSA growth on culture
 - Cell count 7,900, 92% PMNs, cloudy, red, 0.4% Hct, RBC 48,000, protein 4.1, LDH 2,002
- Deemed not a candidate for pericardial window d/t instability, started on high dose colchicine
- Over the following days, vasopressors were weaned and pericardial drain was pulled after decreasing output
- Clinically improving until frank aspiration event led family to pursue comfort cares

Discussion

- Bacterial pericarditis remains an uncommon but dangerous entity in the current antibiotic era, with mortality estimates of 15-40% in treated cases⁴⁻⁷
- Pathogenesis may involve contiguous spread of intrathoracic infections, hematogenous spread, surgical complications, or penetrating chest injury^{2,5}
- Predisposing factors include immunosuppression, prior thoracic surgery, renal failure, and malignancy^{5,8}
- Often presents as only fevers or decompensated sepsis, with typical pericarditis signs/symptoms of chest pain and friction rub less common^{4,5,9}

Discussion

- Diagnosis may be made through direct visualization of purulent pericardial fluid, culture data, or microscopic analysis^{4,5}
- Therapy involves adequate drainage to normalize hemodynamics and achieve source control + IV antibiotics to treat infection^{2,4,5,10}
- Intrapericardial infusions with fibrinolytics may be necessary in cases of loculation development or fibrin deposition^{2,5}
- Further complications of constrictive pericarditis or mycotic aneurysms may warrant further surgical intervention^{5,10}

Take Home Points

- Most cases of acute pericarditis/pericardial effusion are idiopathic in nature, thought 2/2 viral causes
- Consider cardiac tamponade early in workup/differential of shock, and if found, emergent pericardiocentesis is indicated
- If acute bacterial pericarditis is suspected, empiric IV antibiotics with prompt drainage are vital for treatment and stabilization

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Questions?