

From Skin Infection to Pericardectomy: A Cautionary Tale of Undertreated MRSA

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Abstract

Background: Perimyocarditis is characterized by inflammation of the pericardium and myocardium commonly associated with viruses. Infrequently, a purulent perimyocarditis can be associated with bacterial infections, a condition with a much higher mortality (40%). Few cases have been documented of purulent perimyocarditis secondary to community acquired methicillin resistant staph aureus (CA-MRSA).

Case: A 48 year-old male Naval officer with no significant prior medical history was deployed in Bahrain and presented to local providers with malaise and fevers. On exam, he was found to have a right elbow abscess with surrounding cellulitis. The abscess was incised and drained and Augmentin was started. Two days later, cultures of abscess fluid identified MRSA and antibiotics were transitioned to Linezolid. One day later, Linezolid was stopped after a presumed drug rash developed and desloratadine and prednisolone were administered with subsequent resolution of the rash. No antibiotics were restarted. 19 days later, patient re-presented with shortness of breath, chest pain, cough, persistent fevers, and one episode of syncope. A transthoracic echocardiogram revealed a large pericardial effusion with tamponade physiology and a reduced left ventricular ejection fraction (25%). On admission, labs were notable for leukocytosis with left shift, troponin I 3.26 ng/dL, and blood cultures growing MRSA. Emergent pericardiocentesis was performed and 750cc of sanguinous fluid was aspirated. Pericardial fluid cultures again grew MRSA. Intravenous vancomycin was started. Patient was transferred to a United States facility once hemodynamically stable, where a repeat echocardiogram indicated a smaller but loculated effusion with a heavy fibrinous content and constrictive physiology not amenable to repeat pericardiocentesis. Surgical complete pericardectomy was performed. He was transitioned to the surgical intensive care unit where he required pharmacologic and mechanical blood pressure support post operatively but was able to be weaned. Post-operative echocardiogram performed one week after surgery showed an improved ejection fraction (40-45%). At the time of discharge, he was afebrile and hemodynamically stable.

Conclusion: This case illustrates catastrophic consequences of CA-MRSA perimyocarditis including both cardiac tamponade and constrictive myopericarditis. Although the disease typically presents in immunocompromised individuals, this patient likely developed purulent perimyocarditis in the setting of an inadequately treated soft tissue infection and brief immunosuppression for a presumed drug reaction. Increasing awareness and education of CA-MRSA perimyocarditis will allow for early diagnosis and appropriate intervention, which we ultimately hope will contribute to reduced mortality.

Introduction

- Perimyocarditis is characterized by inflammation of the pericardium and myocardium commonly associated with viruses.
- Infrequently, a purulent perimyocarditis can be associated with bacterial infections, a condition associated with much higher mortality.
- Prior to the age of antibiotics, the disease occurred in children and young adults.
- Few cases have been documented of purulent perimyocarditis secondary to community acquired methicillin resistant staph aureus (CA-MRSA).

Case Description

- 48 year-old male Naval Officer with no significant prior medical history who was deployed in Bahrain presented to local providers with malaise, fevers, and a right elbow rash.
- He was diagnosed with a right elbow abscess and managed accordingly.
- His clinical course is described in Figure 1.

Discussion

- Organisms commonly isolated in patients with purulent pericarditis include staphylococcus aureus, Streptococcus pneumonia, and gram-negative bacilli¹.
- CA-MRSA has an estimated prevalence of 56% among skin and soft tissue infections and can cause infection in healthy individuals².
- CA-MRSA can be identified by PCR evaluating for the presence of the Panton-Valentine Leukocidin gene (identified only in CA-MRSA). However, our patient had no risk factors for hospital acquired MRSA.
- Perimyocarditis differs from pericarditis in that the myocardium is involved significantly, which can be evidenced by functional changes as seen in the case described.
- Only 5 cases of purulent pericarditis caused by CA-MRSA have been reported in English literature. Of those:
 - Only 2 cases reported predisposing conditions (skin infections). Both cases reported significant ventricular function impairment compared to other cases.
- Inadequate treatment of CA-MRSA soft tissue infections can predispose to developing purulent pericarditis. Our patient was also given immunosuppression with steroids in the setting of a known bacterial infection.

Conclusions

- CA-MRSA pericarditis can have major complications:
 - cardiac tamponade
 - constrictive pericarditis
 - mycotic aortic aneurysm
 - significant myocardial involvement with potential to endure as seen in this case.
- Untreated CA-MRSA myocarditis carries a mortality approaching 100%. With treatment mortality is still approximately 35%¹.
- CA-MRSA is a pathogen that can be encountered in almost any setting, including resource limited settings such as Bahrain.
- Because of the high associated morbidity and mortality CA-MRSA associated pericarditis or perimyocarditis requires a high index of clinical suspicion, early diagnosis, and aggressive treatment to include appropriate antibiotics and pericardial drainage.
- Increasing awareness of CA-MRSA perimyocarditis will allow for early diagnosis and appropriate intervention, which we ultimately hope will contribute to reduced mortality.

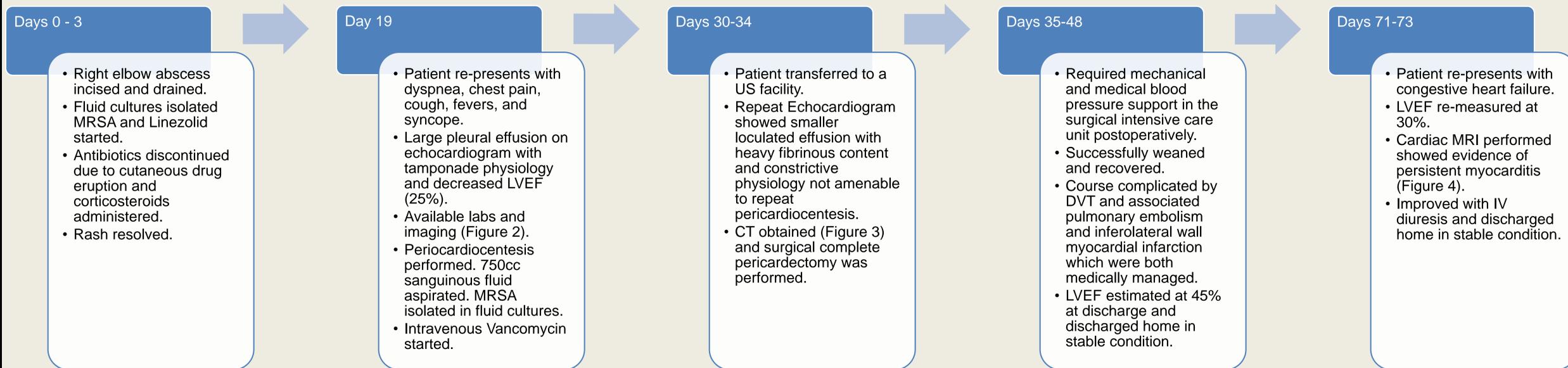


Figure 1. A chronologic description of the patient's presentations and care.

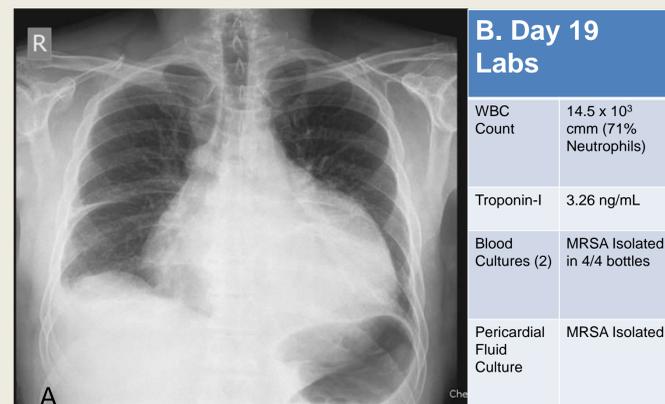


Figure 2. (A) Chest x-ray on Day 19 showing enlarged cardiac silhouette and right pleural effusion. (B) Notable laboratory results.

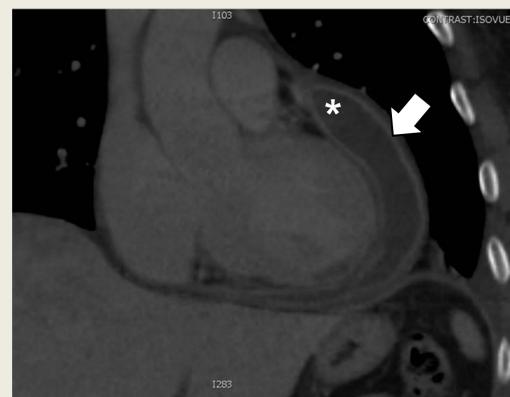


Figure 3. Contrast enhanced computed tomography of the chest on day 31 demonstrating large complex density pericardial effusion (star) and extensive thickening with delayed enhancement of the pericardium (white arrow).

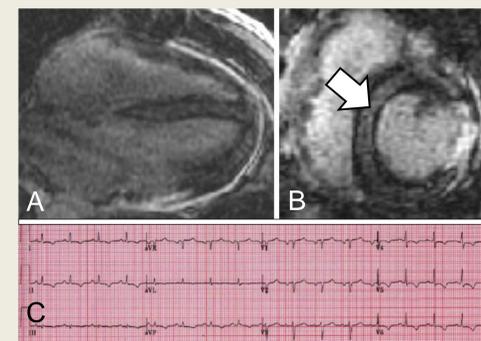


Figure 4. (A,B) Gadolinium enhanced cardiac magnetic resonance image on day 72 demonstrating diffuse myocardial enhancement (white arrow) and an estimated LVEF of 30%. (C) Day 72 ECG tracing showing inferolateral ST changes consistent with ischemic territory but without diffuse ST elevation to suggest acute pericarditis.

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