



## A RARE CAUSE OF PYOPERICARDIUM CAUSING CARDIAC TAMPONADE

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**Abstract-** Cardiac tamponade is a life-threatening emergency. Pyopericardium is one of the rare causes of cardiac tamponade. There are less than 40 cases of adult Pyopericardium reported in medical literature. Here we report an unusual case of Pyopericardium with cardiac tamponade, which was found to be due to *Staphylococcus aureus*.

**Keywords-** Pyopericardium, Methicillin sensitive *Staphylococcus aureus* (MSSA), Cardiac tamponade

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### Introduction

Cardiac tamponade is a life-threatening emergency. Purulent pericarditis (PP) is a rare entity accounting for <1% cases of acute pericarditis. Pyopericardium is one of the rare causes of cardiac tamponade. A literature search has found less than 40 cases of Pyopericardium in adults. Here we report an unusual case of Pyopericardium which was found to be due to *Staphylococcus aureus*.

### Case report

55 year old female with no prior comorbidities presented with complaints of progressive breathlessness on exertion of 1 week duration and 1 day history of fever with chills and rigors. She had been evaluated at a private clinic where her investigations revealed normal blood counts and normal urine routine microscopy examination. Her chest X-ray was showing cardiomegaly and subsequent chest ultrasonography showed large pericardial effusion and small pocket of pleural

effusion and was referred to our hospital for further management.

On presentation, She was tachypneic with respiratory rate of 34/min. Her pulse rate was 110/min with palpable *Pulsus paradoxus* (PP). Her blood pressure at presentation 90/60 mm of Hg with paradoxical drop of 24 mmHg during inspiration. Her pulse oximetry was showing 98% saturation on room air. She was emaciated with BMI of 17.8 kg/m<sup>2</sup>. Her chest auscultation revealed normal bilateral vesicular breath sounds with diminished breath sounds at lung bases and muffled heart sounds with no pericardial rub. Her electrocardiogram was showing sinus tachycardia with low voltage QRS complexes and prolonged QTc interval of 0.49 ms [Fig-1]. 2D echocardiography showed massive pericardial effusion with echocardiographic signs of tamponade including early diastolic collapse of RA, RV and RVOT and significant mitral valve Doppler E wave variation with respiration. The pericardial collection was echo dense with thick echo dense deposits along both the visceral and parietal pericardium.



Fig-1 ECG at admission

Laboratory investigations revealed a total white blood cell (WBC) count of 7800 with 73% neutrophils. Serum albumin was 2.4 g/dl with reversal of Albumin: Globulin ratio of 0.57. There was rise in liver enzymes (SGOT 1329 and SGPT 446) with deranged coagulation profile (INR 1.6). Tests for HbsAg, anti HCV antibodies and HIV serology were all negative.

Emergency pericardiocentesis was done and 6 Fr pigtail catheter was left in situ for subsequent drainage. Initial aspiration revealed 300 ml of thick creamy pus [Fig-2] following which the pulse rate decreased to 90/ min, BP increased to 110/70 mmHg and the patient showed subjective improvement in the dyspnoea.



Fig-2 Thick creamy pus of Pyopericardium

The patient was empirically started on cefepime+ tazobactam combination along with linezolid due to pyogenic nature of aspirate.

The fluid was then sent for analysis, which showed red brown, turbid fluid with degenerated inflammatory cells on wet mount, 18-20 RBC/HPF and plenty of pus cells. Pericardial fluid glucose content was 71 mg% with protein of 3.96 gm%. Microscopy revealed gram-positive cocci arranged singly, in pairs, short chains and clusters. Pericardial AFB was found to be negative and ADA was 262. In view of Pyopericardium, an immediate surgery to create a pericardial window was advised but the patient relatives were not willing for any further interventions. She was thus managed medically with antibiotics along with 3 hourly pericardial tapping via pigtail catheter, with 25-40 ml of pus drained during each aspiration. Liver enzymes showed decreasing trend after pericardial drainage once liver congestion was relieved (SGOT 440, SGPT 222). Two pericardial fluid Cultures which were temporally spaced showed growth of Methicillin-sensitive *Staphylococcus aureus* (MSSA) after 48 hours of aerobic incubation. The same organism was also isolated from her blood culture with the same sensitivity pattern. After 48 hrs the patient went into cardiac arrest following which she was revived after pigtail aspiration of haemorrhagic fluid that has collected rapidly after last aspiration only 1 hr ago suggestive of some bleeding from inflamed pericardium. Emergency surgery was advised but relatives were not willing for it. Following that, the patient left hospital against medical advice. The patient was brought dead to emergency the same night.

### Discussion

Pyopericardium with pericarditis is diagnosed when pus is drained from the pericardial space or when bacteria are cultured from the pericardial fluid. This rare disease is often diagnosed late, when severe hemodynamic compromise occurs due to pericardial tamponade. Viral and idiopathic pericarditis account for 90% of cases of acute pericarditis [1]. Bacterial pericarditis is not typically a primary infection but is almost exclusively a complication from an underlying infection. Risk factors for exudative pericarditis include immunosuppression, chronic diseases, previous chest surgeries and injuries as well as alcohol addiction. The current etiologies of bacterial pericarditis include seeding from circulating bacteraemia, contiguous intrathoracic source (empyema), penetrating trauma, surgical wounds (sternal osteomyelitis), intracardiac source, oesophageal rupture with fistula formation, retropharyngeal abscess, and hepatic/sub diaphragmatic abscess [2,3]. It has a very high mortality rate, of up to 40% if treated and 100% if untreated [4,5]. Our patient did not have any history suggestive of any immuno-compromised state or of any chronic disease. The patient was found to have bacteraemia with blood culture showing growth of *Staphylococcus aureus* but the other reports including chest x-ray [Fig-3] and USG abdomen did not show presence of primary infection elsewhere in the body. Whole body bone x-ray for osteomyelitis anywhere, CECT head and WBC scan would have put some light on any hidden focus; however, it was not possible to do in this patient due to financial constraints.



Fig-3 Chest x-ray of patient after initial pus aspiration showing pigtail catheter in-situ

In the pre-antibiotic era, patients most frequently developed bacterial pericarditis due to pneumonia with empyema, and the most common organism was *Streptococcus pneumoniae* [6]. *S. aureus* is the most common cause of purulent pericarditis in antibiotic era [7]. Other organisms such as *S. pneumoniae*, *H. influenzae*, viridans streptococcus, and anaerobic bacteria have also been reported to be cause of purulent pericarditis [8]. Recent studies have noted a trend toward involvement of anaerobes as a common cause of pericardial infections. One retrospective study found primary anaerobic infections in 40% of cases and mixed infections (aerobic/anaerobic) in 13%; however, there were no clinical or diagnostic differences between these types of infections [8]. The common oral flora *Prevotella* and *Peptostreptococcus* species were predominant anaerobic pathogens in that study.

Management of pyopericardium requires prompt pericardial drainage followed by treatment of underlying cause of the collection. If the pericardial pus is thick, surgical procedures like pericardiectomy with epicardiectomy in addition to the antibiotics according to the sensitivity is required.

Our patient had shown recovery following the pericardial tapping as the tamponade had resolved but was unable to avail the further treatment, which was required and thus succumbed to the disease.

A literature search revealed only 2 cases of *staphylococcal Pyopericardium* being reported from India, one in 34 year old female with end stage renal disease [9] and other in 15 yr old boy with pyomyositis [10]. Our case differs from above two cases by not having any predisposing factors like ESRD as in first and not having any primary focus elsewhere as in the second case.

To summarize, we report a rare case of *staphylococcal Pyopericardium* with bacteraemia from an unknown source of primary infection who could not avail complete antibiotic course and surgical intervention giving rise to a fatal outcome.

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