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A rare complication of dissemination MSSA bacteremia: Pyopericardium with cardiac tamponade managed by pericardial window

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Abstract

Methicillin-susceptible Staphylococcus aureus (MSSA) bactremia is a common clinical diagnosis of general population with variable severity. We demonstrate here a patient who presented with life-threatening condition that required surgical intervention for MSSA pyopericardium that causing cardiac tamponade.

Keywords

MSSA bacteremia; purulent pericarditis; pyopericardium; cardiac tamponade; ECHO; pleura-pericardium window

Introduction

Methicillin-susceptible Staphylococcus aureus (MSSA) bactremia is extremely common with 20–30% of people being carriers [1]. The clinical spectrum ranges from soft tissue infections to more severe and deep-seated infections as bacteremia, toxic shock syndrome, endocarditis, osteomyelitis, etc. MSSA bacteremia is associated with a high mortality rate of 23.3% [1]. Here we demonstrate a rare complication of dissemination MSSA bacteremia.

Case Report

A 46 year old gentleman with underlying diabetes mellitus. He was un-well since 2 months ago, started with multiple leg pustules and gluteal abscesses which were drained surgically in a district hospital. Tissue culture showed Staphylococcus aureus and treated with oral Unasyn®. He was presented to our hospital with lethargy, subfebrile, pedal oedema, and dyspneic a week after discharged from the hospital. He appeared mild tachypneic without septic looking. His initial physical examination was unremarkable

except the pitting pedal oedema. Chest X ray showed cardiomegaly with normal lung field. His blood investigations showed raised white blood cell, 17 x 10^9/L with elevated aspartate aminotransferase (AST) and alanine aminotransferase (ALT). His blood culture grew MSSA which was sensitive to penicillin, methicillin and erythromycin. He was commenced on Cloxacillin® parentally.

Nevertheless, he was deteriorating over days with worsening of dyspneic. His blood pressure throughout the admission was remained normal range (systolic 100-120 mmHg, diastolic 70-80 mmHg) with heart rate persistent tachycardic (ranging 100-120 bpm). Repeated Chest X ray showed massive right pleural effusion. Echocardiography (ECHO) showed pericardial effusion with cardiac tamponade signs. Pericardiocentesis was performed immediately by cardiologist and drained 50 cc thick pus which was grew MSSA as well. CECT Thorax was performed and showed massive right pleural effusion with right lung collapsed and loculated pericardial effusion. He was then referred to cardiothoracic surgical team for surgical intervention. Upon our assessment, he appeared tachypneic with orthopnea. Blood pressure still remained within his usual range. Heart rate was ranging 100-120 bpm. We performed bedside ECHO which still demonstrating the loculated collection with measuring 3 X 4 cm, confined anterior to right heart chambers, causing right atrium and right ventricular collapsed. This critical condition was explained to patient and his family. They agreed for emergency high risk surgery.

He was intubated under general anesthesia. Central venous catheter was inserted. The initial central venous pressure (CVP) reading was 22 mmHg. After positioned him into left lateral position. He was cleaned and draped as per protocol. Transescophageal echocardiography (TEE) was performed which showed right heart chambers were collapsed by the located collection (Figure 1).

Figure 1: Transesophageal echocardiography (TEE): Loculated collection causes right heart chambers collapsed.

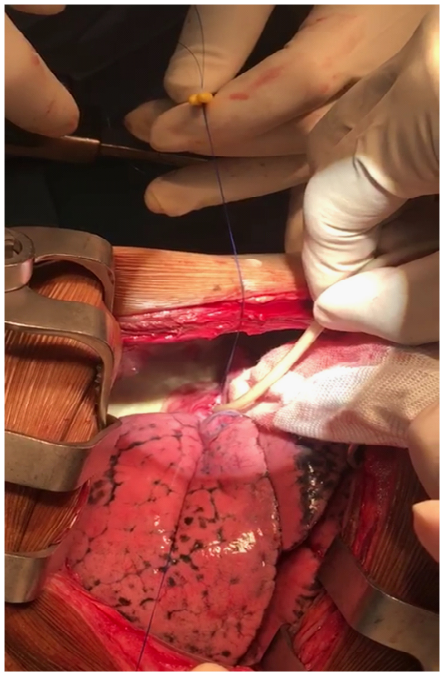

Figure 2: Yellowish thick pus drained after an incision made on the pericardium.

We performed right posterolateral thoracotomy on him via 6th intercostal space. Upon entry the right pleural cavity, 800 ml of straw-coloured fluid was drained. Pericardium appeared bulging and tensed. Upon incising the pericardium, the thick yellowish pus emancipated from the cavity (Figure 2). A total of 400 ml of thick pus drained from the pericardial cavity. The CVP dropped to 14 mmHg with systolic blood pressure raised to ranging of 130-140 mmHg after removed the source of tamponade. Transthoracic echocardiography (TTE) showed no more tamponade effect on right heart chambers compared to prior drainage. A pericardial window with measuring 4 X 4 cm was created anterior to the phrenic nerve. Two chest drains were inserted into pleural cavity which drain apically and basally respectively.

Post-operatively, he was kept in Cardiac intensive care unit (CICU) for close monitoring. The liver enzyme levels and WBC were resume to normal level immediately after the surgery. He was extubated after a day. Repeated ECHO post-operatively no longer show pericardial effusion. Chest tubes were removal after 1 week. He was recovery well with completion of parental Cloxacillin®.

Discussion

Purulent pericarditis (aka pyopericardium) is a rare clinical entity which quoted less than 1% cases of acute pericarditis especially in adults [1,2]. The mode of infection spreading can be classified into: direct extension of chest wall infection, local extension from an intrathoracic process, open chest wall wounds (e.g., penetrating injury or cardiothoracic surgery), and hematogenous spread. The infection is exceptionally high in patients who are immunocompromised, diabetes mellitus, alcohol abuse, and wide spread systemic infection [3]. In our patient, the pyopericardium likely caused by hematogenous spread which evidenced by MSSA cultured in blood and pericardial pus drainage. ECHO remains the gold standard tool for diagnosing pericardial disease and cardiac tamponade [4]. Pericardiocentesis with ECHO-guided is the always the first line treatment in cardiac tamponade [4]. However it cannot evacuate the thick purulent fluid. Hence surgical pericardial drainage with pleuro-pericardium window creation is a mainstay management in this case [4].

Conclusion

Pyopericardium with cardiac tamponade is a fatal condition which required prompt diagnosis and drainage. Surgical pericardial window offers better treatment when subxiphoid pericardiocentesis fails to relieve the life threatening condition.

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