Case Report

Unusual site of disseminated Staphylococcus infection: Erosive chest wall abscess

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ABSTRACT

We report a case of disseminated *Staphylococcus aureus* infection with an erosive chest wall abscess in a 16 year-old gentleman, who presented with 2 days of left knee swelling and high grade fever for one week's duration. He was in sepsis with multiorgan dysfunction. He was found to have left calf abscess, tricuspid valve infective endocarditis, bilateral pulmonary septic emboli with loculated pleural effusion, bilateral pyelonephritis with left renal abscess, and chest wall abscess. The striking feature was the presence of the abscess, which extended through the sternum into the mediastinum with manubriosternal dislocation, involvement of bilateral sternoclavicular joints and left clavicle cortical erosion. Both cultures from blood and pus from calf abscess grew *Methicillin Sensitive Staphyloccus Aureus (MSSA)*. (Rawal Med J 2014;39:356-358).

Key Words: *Staphylococcus aureus,* Sepsis, Disseminated *Staphylococcus aureus* infection, bacteremia, chest wall abscess, infective endocarditis.

INTRODUCTION

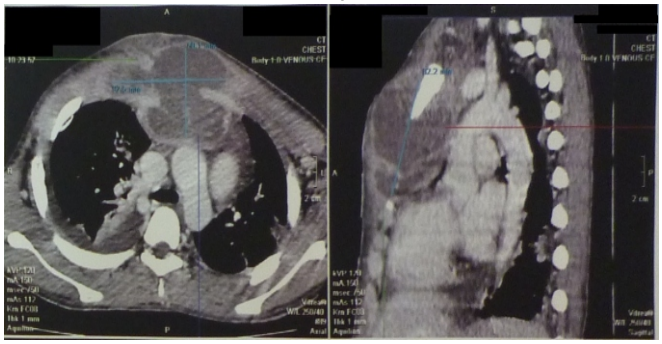
Staphyloccocus aureus is well-known organism responsible for pus-forming skin infection with the tendency for disseminated disease, commonly involving heart valves and bones.[1] Association with blood stream infection and infective endocarditis is reported to be 8%.[2] However, chest wall structure erosion as a result of disseminated *Staphylococcus aureus* infection happens infrequently.

CASE PRESENTATION

A 16 year-old previously healthy gentleman, presented with high grade fever, chills and rigors, preceded by 2 days' history of painful left knee swelling with pus discharge. There was no history of intravenous drug abuse, knee trauma or frequent infection to suggestive of immunocompromised state. On admission, his blood pressure was 123/62mmHg, pulse rate 130 beats per minutes, temperature 38.6 °C, and he was tachypneac with 55 breaths per minute. He was dehydrated, had jaundice and was pale. Erythema was seen on his right chest wall. Cardiovascular examination was normal. There were decreased breath sounds on the right lower zone and crepitations on the right middle zone. His liver was enlarged and Traube's space percussion was dull without a palpable spleen. There was a tender and fluctuant left knee swelling measuring 12cm x 5cm.

Full blood count showed WBC counts 15,000/ µL and platelet count was 21000/ µL. Sodium was 116 mmol/L), urea 40.4 mg/dL, creatinine 129 mmol/L, potassium 5.2 mmol/L), total bilirubin 26 µmol/L, albumin 19 g/L, alanine aminotransferase (ALT) 206 U/L and prothrombin time (PT) 17 seconds. Arterial blood gases showed compensated metabolic acidosis. The chest radiography demonstrated a heterogeneous opacity at the right lower zone. The left knee radiography had no evidence of osteomyelitis. His electrocardiography (ECG) showed sinus tachycardia.

Fig 1. Thoracic CT: Peristernal abscess 5.8 x 11.2 x 8.2 cm with intrathoracic extension, manubriosternal dislocation and bilateral sternoclavicular joint involvement.



Given the clinical picture, he was treated as septicemia with intravenous cloxacillin and ceftazidime as empirical treatment of MSSA infection and melioidosis. After initial stabilization, right lower limb exploration and arthrotomy were performed. The abscess at the posterior compartment of the calf was drained. There was no evidence of septic arthritis at arthrotomy. The echocardiography demonstrated ejection fraction of 65% and a vegetation measuring 1.9cm x 1.2 cm at the tricuspid valve. Following the positive culture of MSSA in the blood and left knee pus with tricuspid valve vegetation, he was treated with high dose cloxacillin and gentamycin as the renal function had normalized.

The erythematous area on the chest wall turned fluctuant and pulsatile. Thoracic computed tomography (Fig.1) revealed a chest wall abscess with retrosternal extension. 150 cc of thick hemorrhagic pus was drained. However, the pus did not yield MSSA. Retroviral screening was negative and he was normoglycaemic. Multiorgan dysfunction resolved with supportive care, interventional procedures and intravenous antibiotics.

DISCUSSION

Staphylococcus aureus bacteremia (SAB) is well known for its association with morbidity and mortality.[1,3] Although in two third of the cases, the focus of the infection can be detected early in the clinical course, but remain elusive in the other cases. The incidence of metastatic infection is higher in the community-acquired infection compared to nosocomial infection.[2,4] Deep structure involvement usually occur hematogenously. Joints, kidneys, central nervous system, intervertebral disc, lungs, liver, spleen, bone and heart valves are the commonly affected sites. Of note, seeding to the heart valve may be totally asymptomatic. According to current data, non-traumatic mediastinal *Staphylococcus aureus* abscess is extremely rare and usually reported in pediatric polulation.[5]

Symptoms of SAB are variable, ranging from fever and myalgia to toxic shock syndrome. The following are features with risk of developing complicated SAB and Staphylococcus infective endocarditis: persistent positive blood culture at 48-96 hours, community-acquired infection, persistent fever at 72 hours after presentation, and skin lesions.[6,7]

This patient presented with typical SA infection. He was at risk of disseminated SA infection. The primary focus of infection was the left knee skin abscess, and subsequently involved various organs. The chest wall abscess had either originated in the mediastinum or had primarily infected the sternum with secondary extension. The mechanism of spread could be via hematogenous or lymphatic system of the lungs. There was no evidence of immunocompromised state in this patient. Unfortunately, the abscess was unable to be contained by the host immune system and antibiotics, and further eroded the adjacent skeletal structures, requiring surgical drainage.

The case highlighted the three key principles in treating such cases with SAB: good supportive care in the intensive unit, early and appropriate antibiotics, early detection of metastatic infection and aggressive removal of the focus of infection.

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