



Case Report

Case Report Of Disseminated Staphylococcal Disease In An Adolescent Boy

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ABSTRACT

A 12 year old previously healthy adolescent boy presented with fever, vomiting, pain in the right hip and a limp. Over the next few days he developed pain in multiple joints, arthritis of left knee, osteomyelitis of right lower femur and left sided loculated pleural effusion with underlying collapse /consolidation. Methicillin Susceptible Staphylococcus aureus was recovered from cultures of blood, synovial fluid and sub periosteal abscess of right lower femur. A final diagnosis of disseminated staphylococcal disease was made. In addition to surgical drainage of infected sites, the patient received 4 weeks of parenteral antibiotics based on reports of culture and sensitivity of blood and pus. Patient improved with a good clinical outcome. He is being followed up for development of residual orthopedic problems.

KEYWORDS: Staphylococcus aureus, Disseminated staphylococcal disease, Septic polyarthritis.

INTRODUCTION

Staphylococcus infection encompasses a wide spectrum of diseases in children [1]. Staphylococcus aureus (S. aureus) bacteremia can be associated with dissemination and life threatening complications [2-7]. Acute disseminated staphylococcal disease (DSD) is the most severe form of staphylococcal infection and

it was first described in 1977 [7]. A case of DSD with septic polyarthritis, osteomyelitis and pneumonia with empyema is presented here. The purpose of reporting this case is to increase awareness about the recognition and management of DSD especially in children presenting with polyarthritis.

CASE REPORT

A previously healthy 12- year- old boy presented to the emergency room limping with fever, vomiting and pain in the right hip. On physical examination the patient had fever (temperature 39° C), bounding pulses, heart rate of 142 beats/minute, respiratory rate of 36 breaths/minute and blood pressure of 100/70 mm Hg. He was toxic, poorly nourished with a weight of 25 Kg. Systemic examination revealed mild pallor, hyperdynamic precordium and hepatomegaly measuring 2 cm below right costal margin. Chest

examination was normal. Left hip joint was tender with restriction of movements. A provisional diagnosis of Septic Arthritis/ Osteomyelitis was entertained and the patient was started on intravenous Ceftriaxone after collecting blood for culture and other investigations.

Initial laboratory investigations included the following: total leucocyte count - 14,400/cu mm, differential leucocyte count - 71% neutrophils with a shift to the left, 22% lymphocytes, 5% monocytes, 2% eosinophils, platelets- 1.5 lacs/cu mm, erythrocyte sedimentation rate -114 mm in

1st hour and C- reactive protein– 48 mg/dl. Chest and pelvic radiographs were normal.

Later on the same day, the patient developed pain in the left shoulder. On the second day he further developed pain in left elbow and right knee joints without obvious swelling. A trial of Aspirin was administered for 48 hours. The patient remained febrile with persistence of pain in the joints. Cultures of blood reported Methicillin Susceptible *Staphylococcus aureus* (MSSA) resistant to Penicillin G, Clindamycin and Erythromycin. Based on culture sensitivity reports the patient was administered parenteral Ampicillin/Cloxacillin and Gentamycin. On the same day he developed pain and swelling of the left knee joint. Around 30 ml of turbid purulent synovial fluid was aspirated from the joint. Gram stain of synovial fluid revealed gram positive cocci in clusters and pairs and culture grew MSSA with antibiotic sensitivity pattern similar to that of blood.

On the 7th day after admission the patient developed chest pain with severe respiratory

distress for which he was transferred to the ICU. Chest radiograph and Ultrasonography (USG) showed loculated left sided pleural effusion with underlying collapse/ consolidation (Figs- 1&2). ECHO was normal. USG guided pleural tap was performed and around 10 ml of blood tinged pus was aspirated. Gram stain and culture of pleural fluid was negative. As the patient showed no improvement, parenteral Vancomycin was added. On the 9th day he developed pain with erythema and swelling in the right thigh. Patient underwent surgical exploration and 15 ml of pus was drained from sub periosteal abscess from the right lower femur. MSSA was recovered from culture of pus with the same antibiotic sensitivity pattern as that of blood and synovial fluid. Based on the results of the above findings a final diagnosis of DSD was made. An evaluation for deep vein thrombophlebitis (DVT) by Doppler USG was negative. Coagulation profile was normal. Surveys for immunodeficiency and connective disease were negative.

Figures 1 : USG chest showing left sided loculated pleural effusion with underlying collapse/consolidation



The patient improved over the next two weeks. He completed 4 weeks of antibiotics with good clinical outcome. Hematological parameters and chest radiograph obtained at the time of discharge

had normalized. On follow up after 1 month there was no fever or recurrence of infection. He is being followed up for development of residual orthopedic problems.

DISCUSSION

S. aureus is ubiquitous and may be a part of human flora found in axillae, inguinal and

perineal areas and anterior nares. Among healthy individuals, 20 – 30 % carries at least one strain of *S. aureus* in their anterior nares. Autoinfection is common and minor infections (styes, pustules) may be the source of disseminated infection. DSD is characterized by fever, persistent bacteremia despite antibiotics and focal involvement of two or more separate tissue sites [1]. The most common organs involved in DSD are lungs, bones and joints followed by skin and muscles, kidneys, liver, central nervous system and heart [8].

S. aureus is the most common cause of septic arthritis and osteomyelitis in children but septic arthritis with *polyarticular* involvement is uncommon [1]. In our case, even though a working diagnosis of septic arthritis was made initially, rapid involvement of multiple joints with persistent fever caused considerable confusion in diagnosis while awaiting blood culture reports. Joint aspiration could not be attempted initially as there was no swelling of the joints. Multiple sites of osteitis and/or septic arthritis as part of DSD have been reported in literature [2-4,6].

Metastatic disease due to *S. aureus* is known to occur in populations with certain pre disposing conditions such as underlying cardiac diseases, prosthetic implants, diabetes, human immunodeficiency virus infection, chemotherapy for neoplasia and steroid therapy. Absence of predisposing factors does not exclude the presence of metastatic disease due to *S. aureus* [9].

Pulmonary complications in sepsis caused by *S. aureus* are common and it is a cause of considerable morbidity [2-5]. In our case, the patient developed unilateral left sided empyema with collapse/ consolidation which resolved completely without the need for chest tube or ventilatory support. Children presenting with *S. aureus* septicemia have higher frequencies of multiple foci [2-7]. Identification and eradication of septic foci is of utmost importance as it not only causes local tissue destruction but is also a source of continued exotoxin release. Heiber et al [7] reported that 50% of extracutaneous foci of infection were not detected and one third of the lesions were noted for the first time on autopsy. If blood cultures remain positive or temperature persists despite appropriate antibiotics, an aggressive search for septic foci is imperative [5]. Untreated staphylococcal septicemia is associated

with a mortality rate of $\geq 80\%$ [1]. Intensive care support, appropriate antibiotics and drainage of septic foci are crucial for a favorable outcome.

CONCLUSION

A high index of suspicion of DSD is to be kept in mind especially in children with fever and polyarthritis. In addition to antibiotics, a meticulous search for foci of infection and drainage is re-emphasized.

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