BILATERAL PNEUMOTHORAX COMPLICATING SEPTIC PULMONARY EMBOLI IN A CHILD WITH OSTEOMYELITIS

Sheeza Imtiaz, Muhammad Saad Ahmed, Ambreen Ibrahim, Muhammad Kashif Shazlee

Department of Radiology, Dr. Ziauddin University Hospital, Karachi, Pakistan.

PJR April - June 2017; 27(2): 135-138

ABSTRACT

Osteomyelitis in childrens are primarily hematogeneous in origin although cases secondary to trauma, surgery or infection in contiguous sites are also reported. Septic pulmonary emboli is a rare complication of osteomyelitis. Numerous pulmonary complications of septic pulmonary embolism have been described, but only a few have reported spontaneous pneumothorax. High clinical suspicion should be raised in patients with osteomyelitis presenting with shortness of breath for prompt diagnosis and treatment. Here we present a rare case of bilateral pneumothorax complicating septic pulmonary emboli in a nine year old child with biopsy proven osteomyelitis.
Keywords: Pneumothorax, Bilateral, Osteomyelitis, Septic pulmonary emboli, Children, Complication

Introduction

Osteomyelitis in childrens are primarily hematogenous in origin although cases secondary to trauma, surgery or infection in contiguous sites are also reported. Septic pulmonary emboli is an uncommon entity in childrens and is a rare complication of osteomyelitis.[1] In SPE, the embolic blood clot that leads to an infarction in the pulmonary vasculature also contains microorganisms that incite focal abscess. Numerous pulmonary complications of septic pulmonary embolism have been described, but only a few have reported spontaneous pneumothorax. Here we present a case of bilateral pneumothorax complicating septic pulmonary emboli in a child with biopsy proven osteomyelitis.

Case Report

A 9 year old boy presented with swelling of the right knee joint with pain. Radiograph of the right knee joint demonstrated ill defined soft tissue swelling with blurring of the myofascial planes. No periosteal reaction or cortical break was identified (Fig. 1). For further

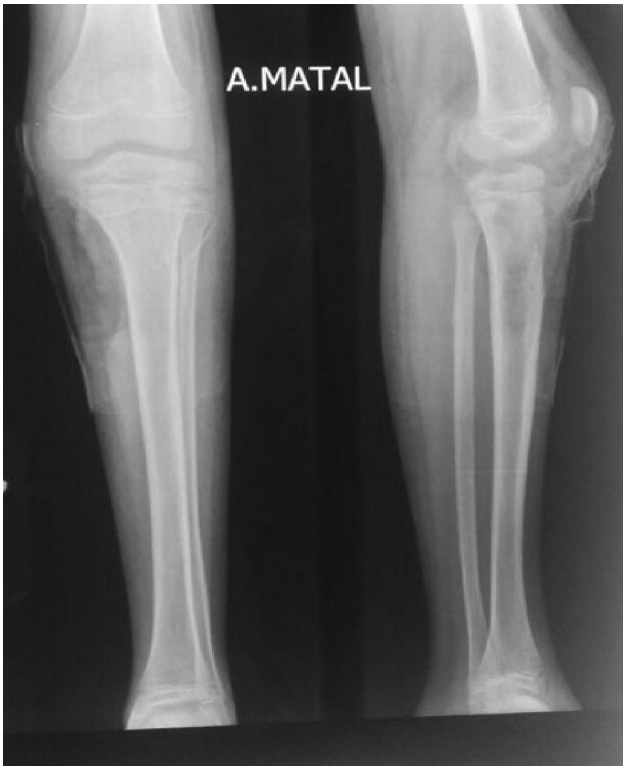

Figure 1: Anteroposterior (AP) and Lateral (L) Radiograph of the right knee joint showing ill defined soft tissue swelling with blurring of the myofascial planes. No periosteal reaction or cortical break was identified.

Correspondence : Dr. Sheeza Imtiaz
Department of Radiology,
Dr. Ziauddin University Hospital,
Karachi, Pakistan.
Email: dr.sheeza.imtiaz@gmail.com

Submitted 3 January 2017, Accepted 15 February 2017

characterization MRI was performed that showed ill defined hyperintense areas involving epiphysis and metadiaphysis of tibia along with marked soft tissue edema (Fig. 2). A differential diagnosis of osteomyelitis and tumor mass lesion was made and biopsy of the lesion suggested. Histopathology confirms the diagnosis of osteomyelitis secondary to staphylococcal aureus infection. Patient was then managed conser vatively under antibiotics cover.

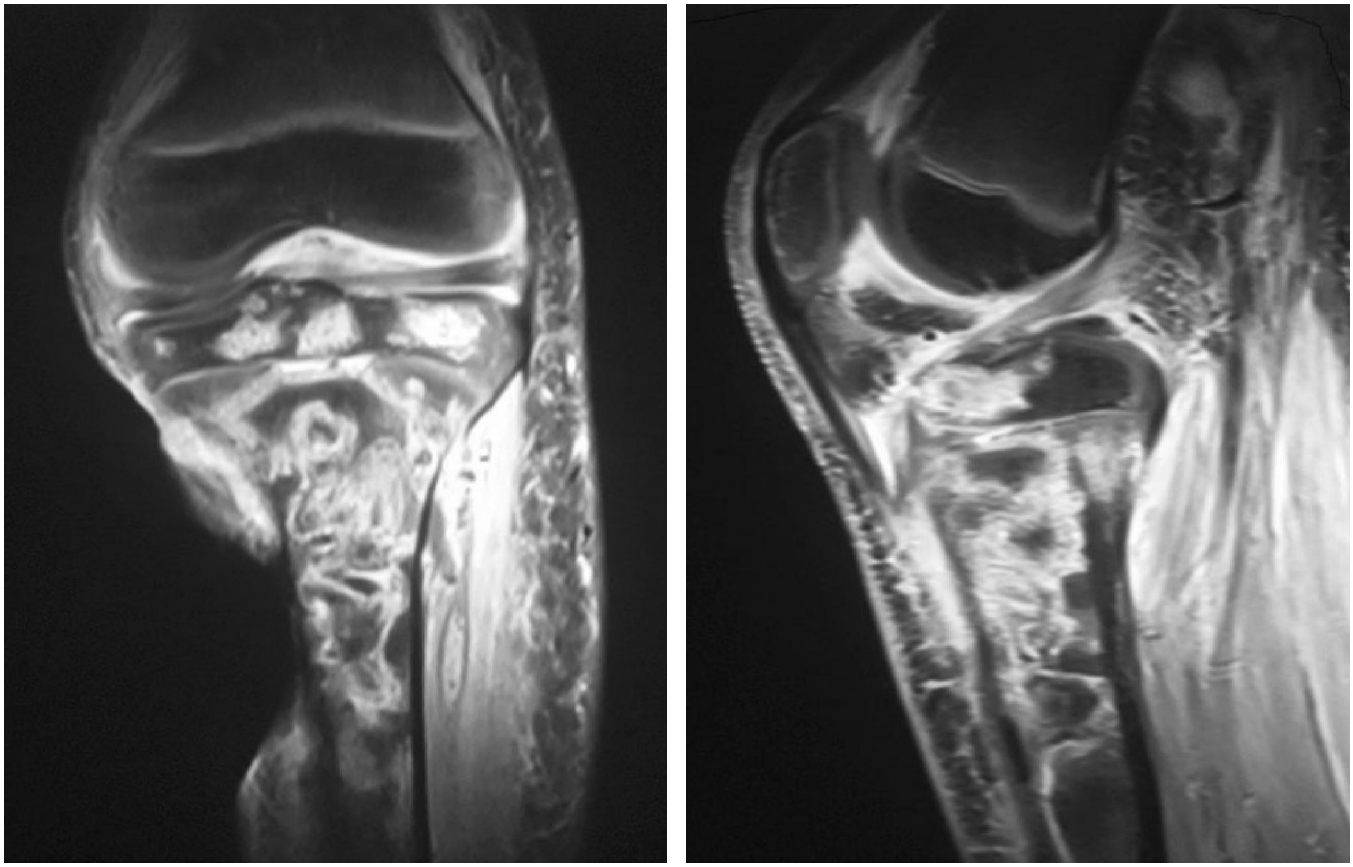

Figure 2: Coronal and Sagittal images of right knee joint showing an ill defined hyperintense areas involving epiphysis and metadiaphysis of tibia along with marked soft tissue edema.

Two weeks after that patient again presented in the emergency department with severe respiratory distress and shortness of breath resulted in hypoxemia. Oxygen saturation was decreased to 75%. Clinically, he was tachypneic (40 breaths / min), tachycardiac (121 beats / min) and febrile (102 degree Fahrenheit). Breath sounds were decreased bilaterally. Laboratory investigations revealed leukocytosis (13,000 cells/mm). Immediate chest radiograph demonstrated bilateral pneumothorax more on the right side. CT Scan chest with contrast was done later on which showed bilateral pneumothorax. Multiple pulmonary nodules of varying sizes are seen scattered throughout both lung fields. These are predominantly peripherally distributed with feeding vessel sign (Fig. 3). Few of the nodules were showing cavitation. Mild left sided pleural effusion was also present. A diagnosis of septic pulmonary emboli was made resulting in spontaneous pneumothorax due rupture of some cavitary lung nodule. An intercostal chest tube was immediately placed. Patient's clinical condition improved after insertion of chest tube and intravenous antibiotics. Later on brochoscopic biopsy of the pulmonary lesions confirmed septic pulmonary emboli. Transesophageal Echocardiography was also performed to rule out vegetations and infective endocarditis that turned out to be negative.

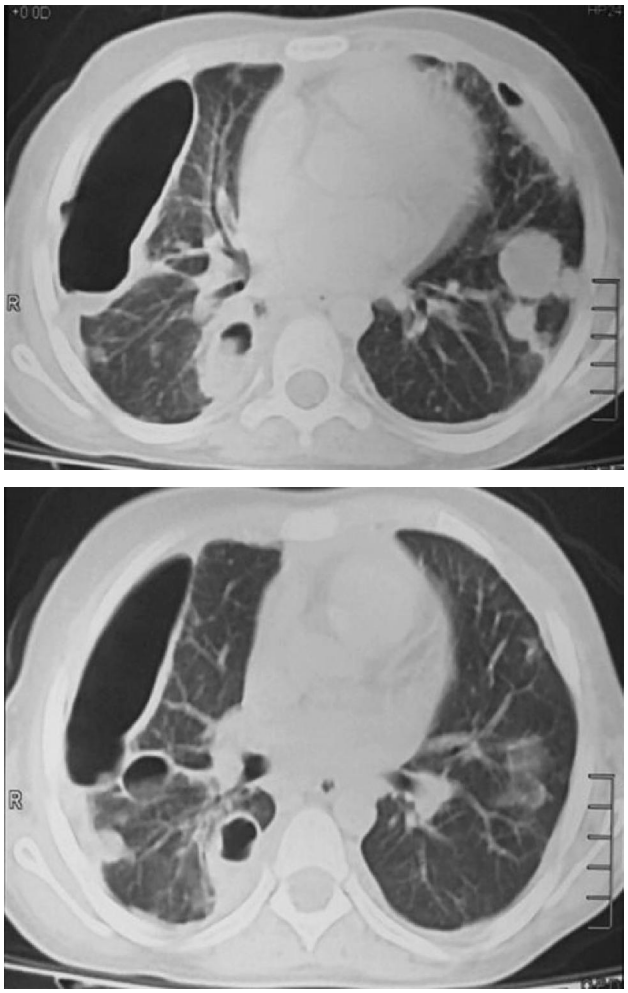

Figure 3: Axial sections of CT scan chest with contrast showing bilateral pneumothorax more on right side. Multiple pulmonary nodules of varying sizes seen in both lungs, peripherally distributed with feeding vessel sign. Few of the nodules showing cavitation.

Discussion

SPE has been associated with risk factors such as IV drug use, pelvic thrombophlebitis and increasing use of indwelling catheters and devices. In children, it is an uncommon disorder and the causes of described in literature include septic thrombophlebitis, bacterial endocarditis, osteomyelitis, soft tissue and urinary tract infection.[2] Osteomyelitis is a rare association of septic pulmonary emboli. If the infective focus is not clinically apparent, Three phase bone scan or WBC labelled bone scan is suggested to identify the source. Children with staphylococcal bacteraemia are particularly prone to osteitis and myositis.[3] Staphylococcus aureus found to be the most common pathogen in 89.2% of the reported cases of SPE in pediatric patients, 70% were MRSA.[1] It has been increasingly associated with deep tissue infections, such as osteomyelitis, septic arthritis, cellulitis, and, rarely, pyomyositis. Wong KS et al.[3] found soft tissue and bone infections as the commonest cause of SPE. In a study conducted by Gonzalez et al.[4] seven children had septic pulmonary emboli of which six had osteomyelitis and one had septic arthritis. Miyashita et al.[5] reported a case of septic pulmonary emboli caused by cellulitis and Yuksel et al.[6] reported with pyomyositis.

High clinical suspicion and awareness is necessary to diagnose SPE. Different radiological presentations has been seen in SPE. The typical features include multiple ill defined rounded or wedge shaped densities ranging in sizes from 0.5 to 3.5 cm. These are predominantly located peripherally abutting the pleura. Feeding vessel sign may be evident on CT scans chest. Patchy air space opacification mimicking non-specific bronchopneumonia may also be seen. Lesions are mostly bilateral and occasionally unilateral. There is rapid progression of nodules into cavities and abscesses.[7] Other features may include empyema, bronchopleural fistula, hilar or mediastinal lymphadenopathy which was not present in this case. In addition mild left sided pleural effusion was present in this case.

Spontaneous pneumothorax from septic pulmonary emboli is a rare entity and should be considered with worsening pulmonary function in an appropriate clinical context. Up to authors knowledge four cases of spontaneous pneumothorax secondary to SPE has been reported in patients with infective endocarditis and only one case reported in intravenous drug abuser.[8] This case is unique as no case of spontaneous pnemothorax complicating SPE in a child with osteomyelitis has been reported in the literature so far. This case demonstrated bilateral spontaneous pneumothorax more on the right side. The pathophysiology of pneumothorax in the setting of SPE is presumed to be erosion of an embolic bacterial cavitary lesion into bronchus with formation of a bronchopleural fistula.

For the treatment of pneumothorax immediate intercostals chest tube insertion would be necessary. Early and prompt treatment with appropriate antibiotics

is important to reduce potential life threatening complications. Empirical treatment requires activity against MRSA using a combination of Vancomycin and Gentamicin or Daptomicin alone. Therapy should be continued for atleast six weeks.

Conclusions

Spontaneous bilateral pneumothorax is a possible lethal complication of septic pulmonary emboli and is rare in patients with osteomyelitis. High clinical suspicion should be raised in patients with osteomyelitis presenting with shortness of breath for prompt diagnosis and treatment. CT scan chest is the imaging modality of choice in the diagnosis of septic pulmonary emboli and to rule out other causes of spontaneous pneumothorax.

References

1. Thabet FC, Alhejaili AS, Alodayani AN, Chehab MS. Septic pulmnary embolism secondary to staphylococcus aureus septic thrombophlebitis in a peadiatric patient. Saudi Med J. 2013; **34(10):** 1080-82

2. MacMillan JC, Milstein SH, Samson PC. Clinical spectrum of septic pulmonary embolism and infarction. J ThoracCardiovasc Surg. 1978; **75:** 670-9.

3. Wong KS, Lin TY, Huang YC, Hsia SH, Yang PH and Chu SM. Clinical and radiographic spectrum of septic pulmonary embolism. Arch Dis Child. 2002; **87:** 312-15.

4. Gonzalez BE, Hulten KG, Dishop MK, Lamberth LB, Hammerman WA, Mason EO, et al. Pulmonary manifestations in children with invasive community-acquired Staphylococcus aureus infection. Clin. Infect. Dis. 2005; **41:** 583-90.

5. Miyashita T, Shimamoto Y, Nishiya H, Koshibu Y, Sugiyama H, Ono, T. et al. Destructive pulmonary embolism in a patient with community-acquired staphylococcal bacteremia. J. Infect Chemother. 2002; **8:** 99-102

6. Yuksel H, Yilmaz O, Orguc S, Yercan HS, and Aydogan D. A pediatric case of pyomyositis presenting with septic pulmonary emboli. Joint Bone Spine. 2007; **74:** 491-94.

7. Cohen RI, Rossoff LJ. A patient with fever and an abnormal roentgenogram. EurRespir J 1994; **7:** 1719-20.

8. Sheu CC, Hwang JJ, Tsai JR, Wang TH, Chong IW, Huang MS. Spontaneous Pneumothorax as a complication of septic pulmonary embolism in an Intravenous Drug User: A Case Report. Kaohsiung J Med Sci. 2006; **22:** 89-93.