

Bilateral Necrotizing Pneumonia Secondary to Septic Pulmonary Embolism in the Setting of Septic Shock, Septic Arthritis, Bacterial Endocarditis, and Methicillin Sensitive Staphylococcus Aureus Bacteremia

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Introduction

Community acquired pneumonia is the most common type of pneumonia in children. Pneumonia due to septic emboli is extremely rare in this age group. We present a unique case of bilateral necrotizing pneumonia that occurred in the setting of septic shock and multisystem septic emboli.

Case

The patient is a 16-year-old previously healthy male who presented with a four day history of right knee pain and swelling and a two day history of dyspnea with orthopnea. Symptoms started soon after playing football without history of significant injury. He was admitted because of worsening shortness of breath and knee swelling.

On admission, he was noted to have fever, increased work of breathing, and hypoxemia. Chest X-ray showed bilateral lung infiltrate. He progressed rapidly to respiratory failure and required intubation on the day of admission. Simultaneously, he displayed signs of septic shock with decreased capillary refill, tachycardia, and hypotension. He received multiple intravenous (IV) fluid boluses and IV vasopressors to maintain hemodynamic stability. Blood culture was positive for Methicillin Sensitive Staphylococcus Aureus (MSSA). Therefore IV antibiotics were started. Chest computed tomography (CT) on admission showed scattered bilateral round infiltrates consistent with septic emboli (Figure 1). Repeat chest CT four days later showed expanded consolidation with pneumatoceles and air leak consistent with necrotizing pneumonia (Figure 2).

Figure 1: CT chest with IV contrast with bilateral granular infiltrates

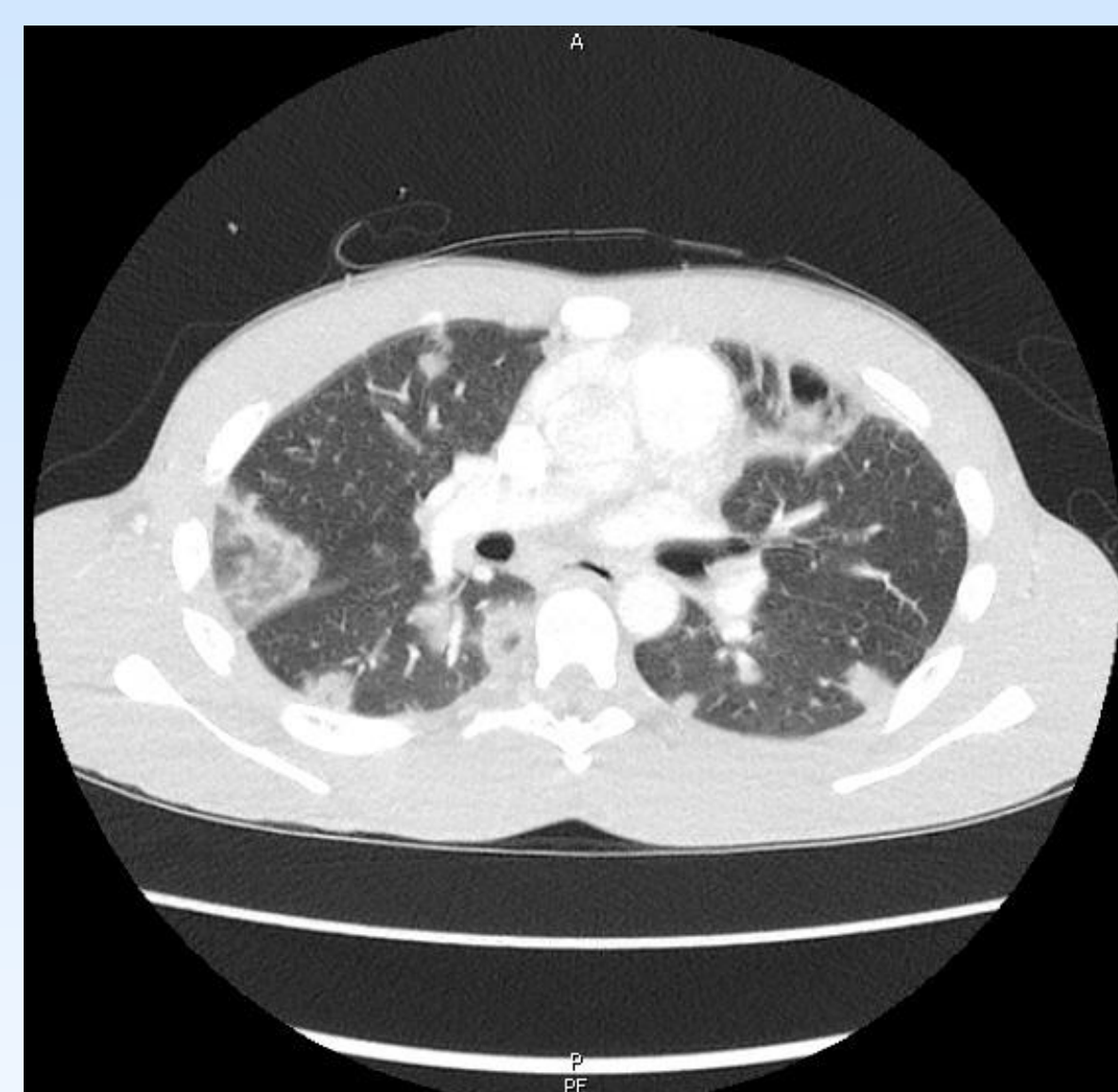
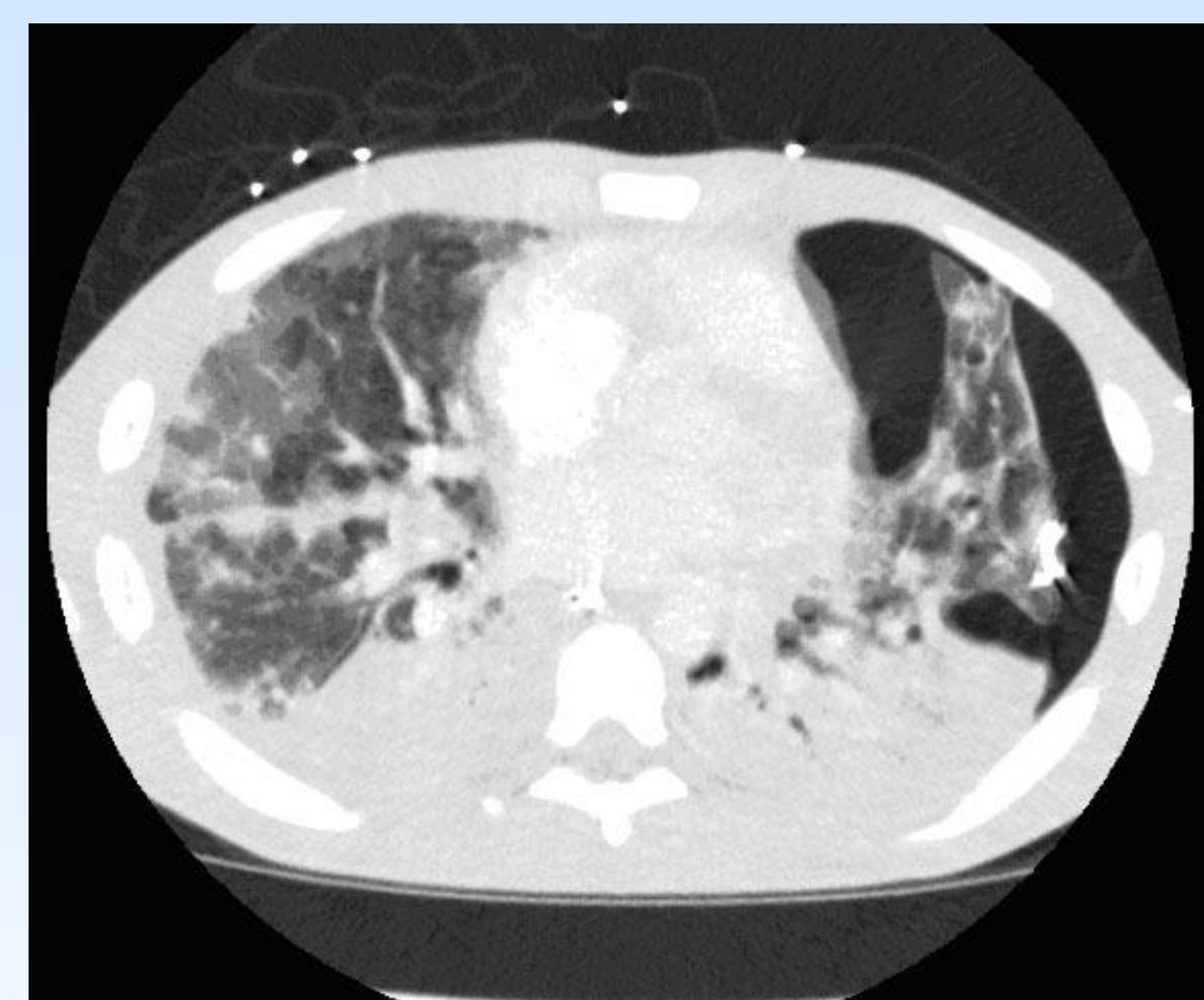


Figure 2: CT chest with IV contrast with extensive lung consolidation bilaterally and left pneumothorax



The right knee joint fluid was aspirated, and the culture was positive for MSSA. Left knee swelling was noted but was of lesser degree. Ultrasound showed thrombosis of the right superficial femoral and popliteal veins. Transesophageal echocardiography (TEE) showed a small vegetation on the mitral valve with evidence of mitral valve perforation consistent with acute bacterial endocarditis (Figures 3,4).

Figure 3: Mitral Valve Anterior Leaflet Vegetation with Perforation on TEE (Arrow)

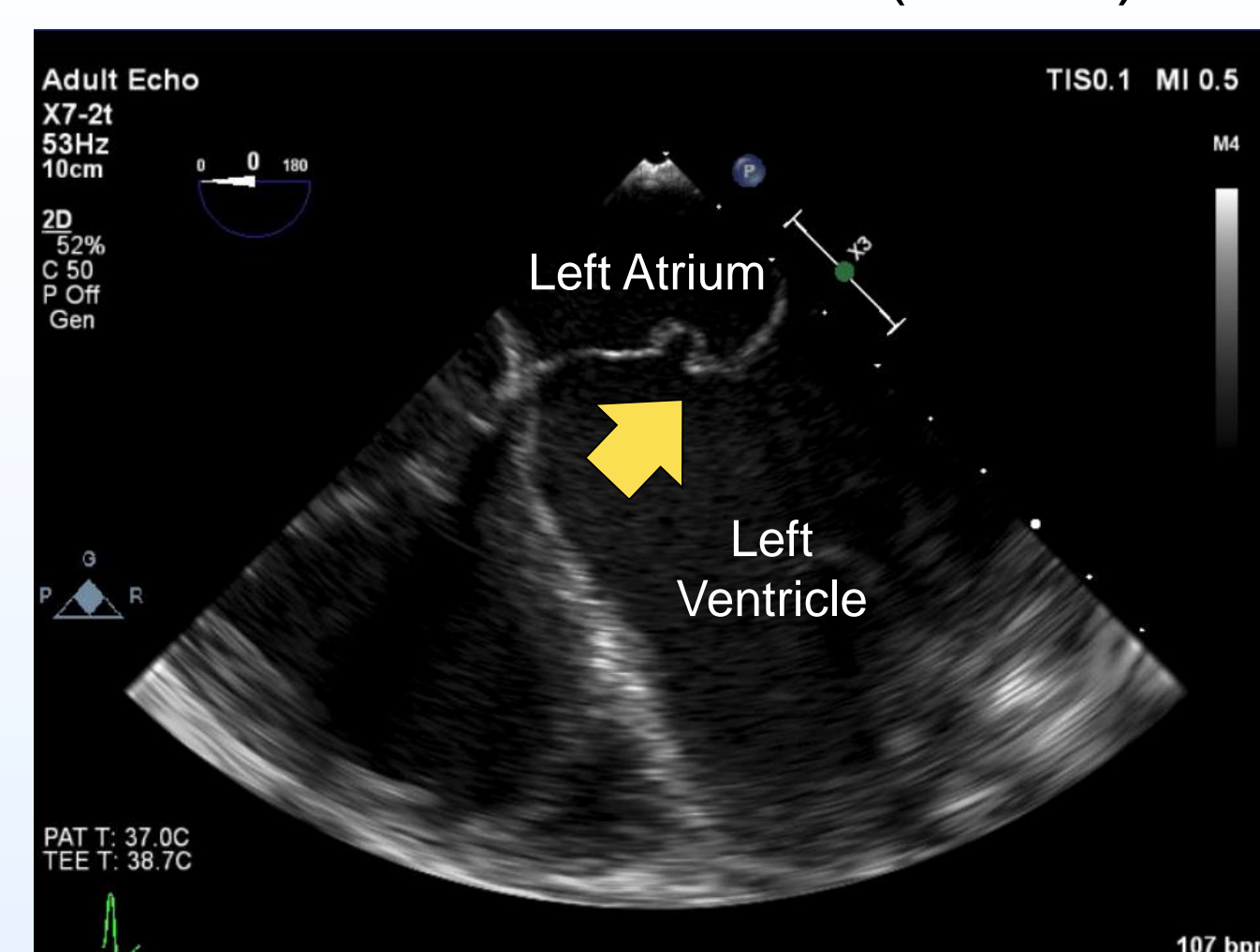
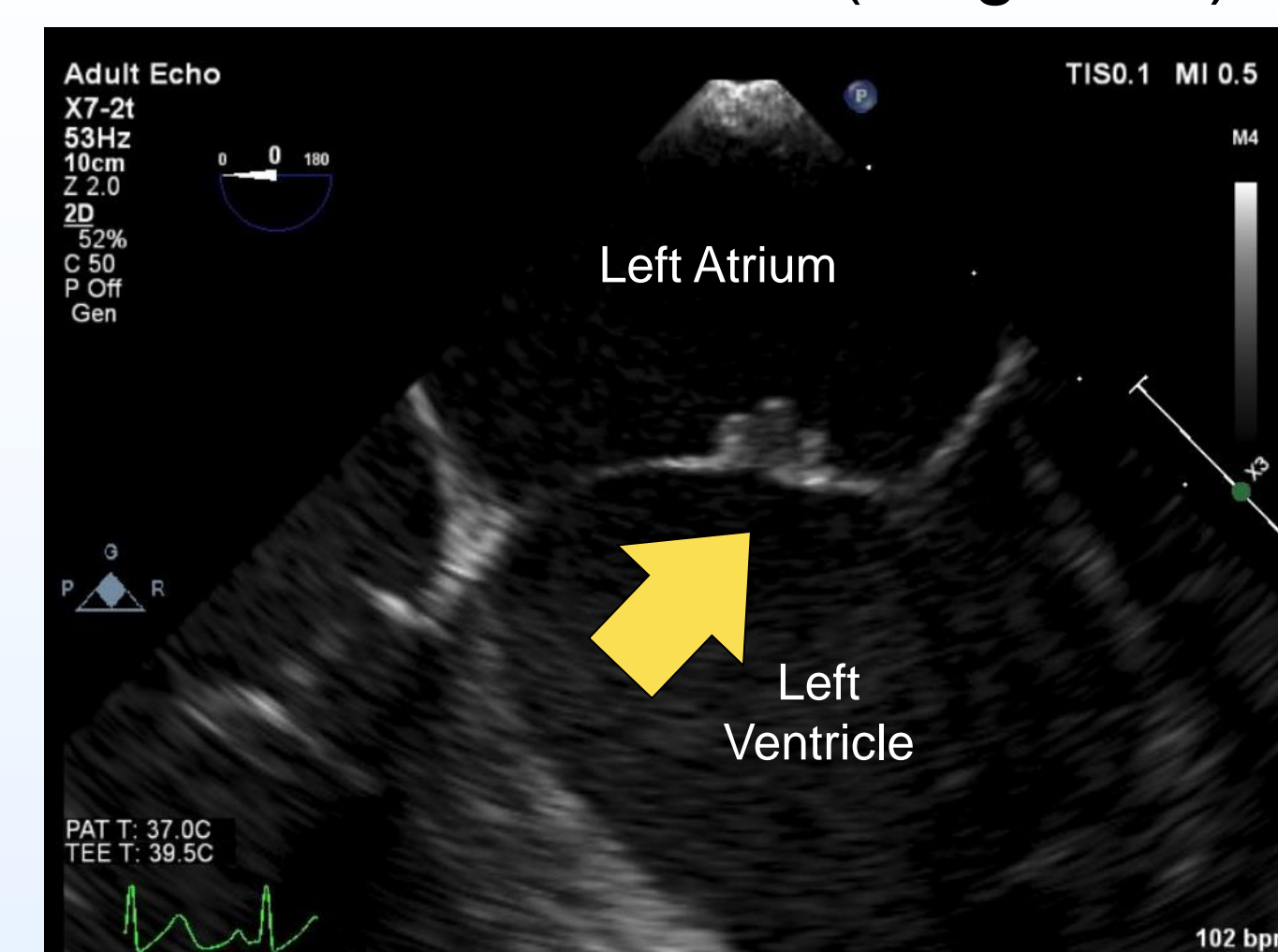


Figure 4: Mitral Valve Anterior Leaflet Vegetation with Perforation on TEE (Magnified)



The patient demonstrated clinical improvement with IV antibiotic therapy. He underwent open-heart surgery for excision of the anterior mitral valve leaflet vegetation with patch valvuloplasty of the mitral valve leaflet perforation. He was successfully extubated to high flow nasal cannula 15 days after admission as his clinical condition improved.

Discussion

The initial nidus of the MSSA infection that led to septic shock with multiorgan involvement that included the knee joints, the heart, and the lungs is unknown. Possible initial etiologies include IV drug abuse, a break in the skin, or de novo bacterial endocarditis with multiorgan septic emboli^{1,2}. The patient denied IV drug use. It was unlikely that the patient was immunocompromised based on the history of no prior infections, normal serum immunoglobulin levels, and negative HIV testing. This case of pneumonia in a previously healthy teenage patient is unique in its presentation because of the association with multiple septic emboli possibly caused by infective endocarditis of the mitral valve. The rapid clinical progression from knee pain to respiratory failure in a small number of days and the severe presentation both highlight the importance of recognizing this unique presentation early and intervening aggressively when this occurs.

References:

1. Khan S, Smyrlis A, Yaranov D, Oelberg D, Jimenez E. A Complicated Case of Triple Valve Infective Endocarditis in an IV Drug User with a Bicuspid Aortic Valve Requiring Three Separate Salvage Operations: A Case Report and Literature Review. *Case Reports in Cardiology*. 2015.
2. Griethuysen J, Dubrey S. Fever in an intravenous drug user. *BMJ*. 2016; 352:i1137. doi: 10.1136/bmj.i1137.