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CORRESPONDENCE

Septic pulmonary and cerebral embolism caused by community-associated methicillin-resistant *Staphylococcus aureus* in a healthy child



Septic pulmonary embolism (PE) is a rare disease in children, but the mortality rate is high. No cases of children with septic cerebral embolism (CE) were found in the literature. A previously healthy 13-year-old boy presented to a community hospital in 2007 complaining of headache, nausea, and intermittent fever for the past 3 days, and was treated empirically with amoxicillin. Three days later, he was transferred to our hospital with nuchal rigidity, severe vomiting, and drowsiness. A review of his history revealed that he had developed a carbuncle over his left thigh in the past week. A detailed clinical examination revealed a congested throat, nuchal rigidity, and coarse breathing. Brudzinski and Kernig signs were all negative. Initial laboratory investigations revealed a white blood cell count of $9.6 \times 10^3/\text{mm}^3$ (91.9% neutrophils), hemoglobin level of 13.5 g/dL, platelet count of $200,000/\text{mm}^3$, and C-reactive protein level of 37.88 mg/dL. The cerebrospinal fluid analysis revealed a red blood cell count of $840/\text{mm}^3$ and a white blood cell count of $1960/\text{mm}^3$ (neutrophil 84%). Empiric antibiotics, vancomycin 750 mg i.v. q6h and ceftriaxone 2.0 g i.v. q12h, were used. The cerebrospinal fluid culture was negative. Two sets of blood cultures grew methicillin-resistant *Staphylococcus aureus* (MRSA), which was susceptible to gentamicin, vancomycin, teicoplanin, trimethoprim–sulfamethoxazole, and ciprofloxacin, but resistant to oxacillin, penicillin, clindamycin, and erythromycin. The isolated strain carried the staphylococcal chromosomal cassette (*SCC*) *mec V_T* gene, sequence type ST59, and the Pantone–Valentine leukocidin (*PVL*) gene.

On the 4th day of treatment, a chest X-ray displayed patchy opacities over the right middle lobe and 1.6 cm nodular opacity over the lower left lung zone. Thoracic computed tomography revealed multiple nodules in both lungs associated with cavitory change. These findings

strongly suggested septic PE (Fig. 1A). Brain magnetic resonance imaging was performed because the headache and nausea persisted. After contrast administration, areas of leptomeningeal enhancement along the sulci and fissures were observed on the left and bilateral cavernous sinuses, as well as two acute lacunar infarcts in the left frontal and anterior temporal white matter (Fig. 1B). The findings were suggestive of septic CE. After 4 weeks of vancomycin administration, the patient was administered oral antibiotics with rifampin and co-trimoxazole for 2 weeks. Recovery has remained uneventful to date.

Septic PE is an unusual nonthrombotic PE. We did not notice any common potential source or underlying condition that predisposed the patient to pediatric septic PE. The probable source of septic PE was a soft tissue infection. To our knowledge, no other case of concomitant septic PE, CE, and acute infarction has been reported to date. The most common pathogen of septic PE was *S. aureus*,¹ and community-associated MRSA infections have increased markedly in the past decade in the United States, as well as in Taiwan.² The community-associated MRSA isolate in our case carried the *SCCmec V_T* and *PVL* genes. The *SCCmec V_T* was first identified in Taiwan in 2004.³ The molecular community-associated MRSA isolates in Taiwan belonged to ST59 and carried *SCCmec V_T* and *PVL* genes, and has been called the “Taiwan clone.”^{2,4} The strain has not spread from health care facilities, but has originated *de novo* in the community and has been found in several cases with invasive infection, including endocarditis and necrotizing pneumonia.^{5,6} Another brief report showed a 15-year-old boy with community-acquired osteomyelitis complicated by PE caused by *PVL*⁺ ST59 methicillin-susceptible *S. aureus*, strain KS1, which had *PVL* and peptide cytolysin (PSMs) with high expression levels, which may be related to invasive

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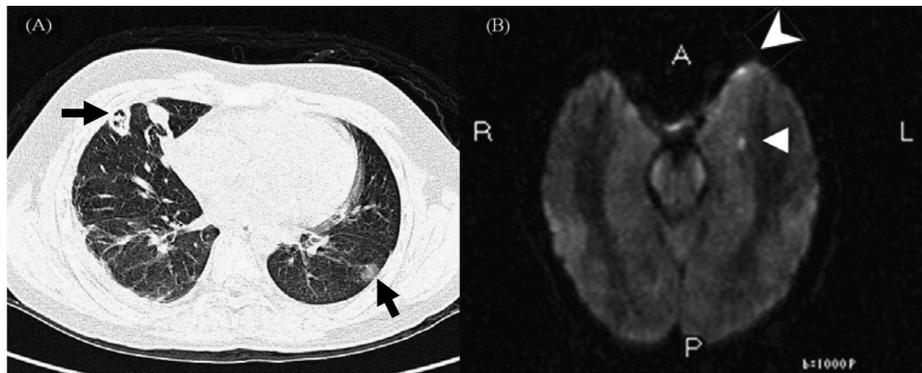


Figure 1. (A) Chest computed tomography revealed multiple nodules in both lungs associated with cavitory change (arrow), especially over the outer border, suggesting septic pulmonary embolism. (B) Brain magnetic resonance imaging study. Diffusion-weighted image reveals two acute lacunar infarcts in the left frontal (arrowhead) and anterior temporal white matter area (triangle). These findings are suggestive of septic cerebral embolism.

infections and PE.⁷ Pediatricians should be aware that critically ill children with a skin or soft tissue infection, when associated with septic PE and CE, in an area with a high rate of MRSA, should be empirically treated with glycopeptides prior to susceptibility results being known.

Conflict of interest

All the authors declare that they have no competing interests.

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