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SHORT COMMUNICATION

Lung abscess from *Staphylococcus aureus* after varicella infection in a 3-month-old infant



Deniz Aygun^{a,*}, Fatih Aygun^b, Ayse A. Kılınc^c, Halit Cam^b,
Haluk Cokugras^a, Yıldız Camcıoğlu^a

^a Department of Pediatric Infectious Diseases, Clinical Immunology and Allergy, Cerrahpasa Medical Faculty, Istanbul University, Istanbul, Turkey

^b Department of Pediatric Intensive Care Unit, Cerrahpasa Medical Faculty, Istanbul University, Istanbul, Turkey

^c Department of Pediatric Pulmonology, Cerrahpasa Medical Faculty, Istanbul University, Istanbul, Turkey

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Abstract Varicella is a common, highly contagious viral infection of childhood. Varicella is a usually benign and self-limited disease, but it can be complicated by severe bacterial infections, especially in immunocompromised hosts. In this study, we describe a previously healthy 3-months-old infant who was admitted with high fever, cough, and respiratory distress, who had a history of varicella infection three weeks before, with exposure from her adolescent, unvaccinated sister. A lung abscess caused by *Staphylococcus aureus* complicating the varicella infection was discovered. The patient was aggressively treated with drainage of the abscess and intravenous antibiotics and had a good recovery.

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Introduction

Varicella is a vaccine preventable childhood disease caused by the varicella zoster virus (VZV), an alpha-herpesvirus of the genus *Varicellovirus*. Primary varicella infection is characterized by fever and a specific, generalized pruritic vesicular rash.

* Corresponding author at: Department of Pediatric Infectious Diseases, Clinical Immunology and Allergy, Cerrahpasa Medical Faculty, Istanbul University, Istanbul, Turkey.
Tel.: +90 532 7868682; fax: +90 212 6328633.

E-mail address: fdenizaygun@gmail.com (D. Aygun).

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The virus is present in both the respiratory secretions and skin vesicles. It is transmitted through the airborne route with respiratory secretions and through direct contact with the skin lesions. It is an extremely contagious disease; in secondary household contacts the transmission rate can be as high as 90% [1,2]. Although, varicella is generally a mild and self-limited illness, it can cause severe complications in infants and immunocompromised patients [3]. Herein, we describe a case of a lung abscess due to *Staphylococcus aureus* complicating a varicella infection in a 3-months-old infant. Vaccination is the most effective strategy in preventing the complications of varicella. This case report highlights a rare complication of varicella and underscores the importance of vaccination against varicella for all age groups, as our case developed varicella after her adolescent unvaccinated sister's primary varicella infection.

Case report

A previously healthy 3-months-old female infant was admitted with high fever, cough, and respiratory distress. Three weeks prior to admission to the hospital, she had suffered from a varicella infection after exposure to her unvaccinated, adolescent sister's infection. She did not receive any treatment.

On examination, she had resolving lesions typical of varicella without superinfection of the skin. She was tachypneic, with a respiratory rate of 80 breaths/min and blood oxygen saturation was 84%. The body temperature was 39.8° C and the heart rate was 144 beats/min with poor perfusion. Auscultation of the lungs revealed decreased respiratory sounds in the right upper lobe. The remainder of the physical exam was unremarkable. Initial laboratory investigations revealed, total leukocyte count of 26300/mm³ (neutrophils: 19,600, lymphocytes: 4,700), hemoglobin 8 gr/dL, and platelet count of 437, 000/mm³. Erythrocyte sedimentation rate was 58mm/h and C-reactive protein (CRP) was 11.4mg/dL. Liver and renal function tests and electrolyte levels were all within normal ranges. Serum immunoglobulin levels were normal (immunoglobulin (Ig) G: 682 mg/dL (normal range: 232–1411), Ig M: 139 mg/dL (normal range: 0–145), Ig A: 7 mg/dL (normal range: 0–83)). Cytometric analysis of T, B, and NK cells revealed normal values. Nitroblue tetrazolium test (NBT) was normal. Venous blood gas measurements were, pH: 7.32, pCO₂: 55.4 mmHg, pO₂:29.2 mmHg, NaHCO₃: 28.1 mmol/L, and BE: 2 mmol/L. For

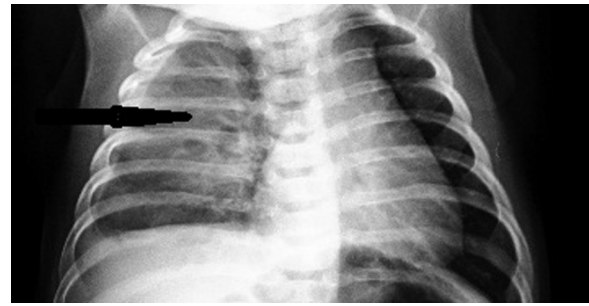


Fig. 1 Chest x-ray showing consolidation in the right lung with air bronchograms and hyper-infiltration of the left lung.

acute respiratory failure noninvasive positive pressure ventilation (NPPV) was initiated in pressure support mode (FIO₂ 0.5, inspiratory positive airway pressure 12 cm H₂O, expiratory positive airway pressure 8 cm H₂O).

Chest x-ray showed consolidation in the right lung with air bronchograms, obliteration of the right costophrenic sinus, and hyper infiltration of the left lung (Fig. 1). Computed tomography (CT) scan of the chest demonstrated an abscess 1.5 cm in diameter in the left pulmonary field with an air-fluid level (Fig. 2). The abscess was percutaneously drained by pig-tail catheter insertion. Aspirated fluid appeared sludgy with studies as follows: white blood cell count 20/mm³ (predominantly polymorphonuclear leucocytes) glucose 30 mg/dL, protein 48.1 mg/dL, and LDH 22 IU/L. The culture of the abscess yielded methicillin resistant *Staphylococcus aureus*. On the fifth day of treatment, the catheter was removed. Based on the history of varicella, radiological and culture results, pneumonia and lung abscess were considered and parenteral



Fig. 2 Chest CT demonstrating a lung abscess in the left pulmonary field.

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