Varicella Reinfecion with Unilateral Varicella Pneumonia

Ryo Ariyasu, Kazuhiko Nakagawa, Naoya Ikegami, Chisato Konishi, Satoshi Nakao, Tomoko Funazo, Masato Taki, Kyohei Morita, Moon Hee Hwang, Chie Yoshimura, Toshiaki Wakayama and Yasuo Nishizaka

Abstract

Varicella zoster virus (VZV) infection does not always provide lifelong immunity. A reinfection with VZV occurs more commonly than previously thought. Varicella infection spreads through the blood-stream, causing pneumonia. Varicella pneumonia results in bilateral pulmonary nodular infiltrations. We herein report a case of varicella reinfection with unilateral varicella pneumonia in which a reduced pulmonary blood flow due to radiation damage was considered to be the cause of unilateral pneumonia. In patients with an asymmetric pulmonary blood flow, careful interpretation of unilateral infiltration is therefore considered to be important with making a differential diagnosis.

Key words: varicella zoster virus, varicella reinfection, varicella pneumonia, unilateral pneumonia

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Introduction

Varicella zoster virus (VZV) infection generally provides lifelong immunity. However, reinfection with VZV occurs more commonly than previously thought (1). Varicella pneumonia is the most common complication of VZV infection in adults (2). Computed tomography (CT) findings in varicella pneumonia patients generally show bilateral nodular infiltration (3). We herein report a case of varicella reinfection with unilateral varicella pneumonia.

Case Report

A 56-year-old male with a history of varicella in childhood presented with a cough and skin rash. The patient was diagnosed with Stage IIIIB lung adenocarcinoma in the left lung nine months prior to admission. The patient was treated with opposing portal irradiation (total 60 Gy), combined with four chemotherapy cycles of cisplatin and pemetrexed. Five months after the therapy, the patient developed radiation pneumonitis in the left lung and began to take oral prednisolone (2.5 mg/day). Oral prednisolone was gradually tapered and the disease activity was controlled with prednisolone (2.5 mg/day).

A physical examination revealed the following findings: temperature, 36.4°C; blood pressure, 144/82 mmHg; pulse, 78/min. Chest auscultation revealed fine crackles in the upper left lung area. Many erythematous macules and papules measuring 2-3 mm in diameter were observed over the entire body, and one vesicle was evident on the knee (Fig. 1).

The laboratory analysis indicated a white blood cell count of 6,990/mm³ and a C-reactive protein level of 2.1 mg/dL. The serum titer of VZV IgM was positive [2.12 on an enzyme immunoassay (EIA)], and the titer of VZV IgG showed a significant elevation (1190 on EIA). The VZV antigen test of the vesicle was also positive.

Chest CT revealed an infiltrative shadow of radiation pneumonitis in the left upper lobe and displayed diffuse small nodules with surrounding ground-glass attenuation only in the right lung field (Fig. 2).

Bronchoscopy showed a normal mucosa. A smear and culture of bronchoalveolar lavage fluid (BALF) in the right lung was negative for any infectious pathogens. A polymerase chain reaction (PCR) analysis of the BALF was positive for VZV.

The patient was diagnosed with varicella reinfection with varicella pneumonia. After treatment with acyclovir, the skin

Department of Respiratory Medicine, Osaka Red Cross Hospital, Japan
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Correspondence to Dr. Ryo Ariyasu, ariari88@hotmail.com
rash and respiratory symptoms were all resolved.

Discussion

We herein report a case of varicella reinfection with unilateral varicella pneumonia. To our knowledge, this is the first reported case of unilateral varicella pneumonia.

Reinfection with VZV occurs more commonly than previously thought, and the incidence of varicella in adults has increased in recent years. In an active surveillance initiative in California, the percentage of patients diagnosed with varicella who reported previous varicella infections ranged from 4.5-13.3% (1).

The patient in this case was immunocompromised because of corticosteroid use and lung cancer, which may be a risk factor for reinfection (4). However, the case report demonstrates that reinfection with VZV can occur even in an immunocompetent adult (5).

Varicella pneumonia is the most common complication of varicella infection in adults (2), spreading through the bloodstream and causing pneumonia (6, 7). The most common CT findings of varicella pneumonia thus include bilateral nodular infiltrates (3).

However, the CT findings in the present case showed unilateral nodular infiltrates only in the right lung. We speculate that the blood flow through the left lung was reduced because of radiation therapy. McDonald et al. and Chin et al. demonstrate that radiation therapy for lung cancer commonly induces pulmonary damage resulting in decreased perfusion (8, 9). One month after discharge, we performed perfusion scintigraphy on the patient, which showed a decreased perfusion rate in the left lung (left, 37.7% versus right, 62.3%) (Fig. 3).

In a search of the pertinent literature, we found similar cases of drug-induced pneumonia, Izumo et al. and Umeki et al. reported on drug-induced pneumonia patients with unilateral pulmonary infiltrates (10, 11). They also showed that

Figure 1. A) Many erythematous macules and papules measuring from 2-3mm in diameter were observed over the patient’s entire body. B) One vesicle was also observed on the knee.

Figure 2. A high-resolution CT scan obtained on presentation showing diffuse small nodules with surrounding ground-glass attenuation only in the right lung field and infiltrative shadow of radiation pneumonitis in the left upper lobe.

Figure 3. Perfusion scintigraphy showing a decreased perfusion rate in the left lung (left 37.7% versus right 62.3%).
the blood flow through the lung on one-side was reduced because of lobectomy, thereby causing unilateral pneumonia. In patients with an asymmetric pulmonary blood flow, careful interpretation of unilateral infiltration is therefore considered to be important when making a differential diagnosis.

The authors state that they have no Conflict of Interest (COI).

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