

# Computed tomography manifestations of a case of varicella zoster virus (VZV) pneumonia

Minlong Zhang  | Cuiping Yang | Yinghua Guo

College of Pulmonary & Critical Care Medicine,  
8th Medical Centre, Chinese PLA General  
Hospital, Beijing, People's Republic of China

## Correspondence

Minlong Zhang and Yinghua Guo, College of  
Pulmonary & Critical Care Medicine, 8th Medical  
Centre, Chinese PLA General Hospital,  
Corresponding address: No.17 Heishanhu Rd,  
Haidian District, Beijing, People's Republic  
of China.  
Email: 740720039@qq.com and 15991798305@  
163.com

Associate Editor: Jennifer Ann Wi

## Key message

Disseminated VZV infections is rare in healthy adults. Several studies have reported VZV reactivation and eruption happens in an immunocompromised host especially after solid organ transplantation. Nonetheless, diffuse bilateral lung VZV infections is also rare. We report a case of disseminated VZV pneumonia after renal transplantation and methylprednisolone treatment. This report highlights the computed tomography manifestations of disseminated VZV pneumonia.

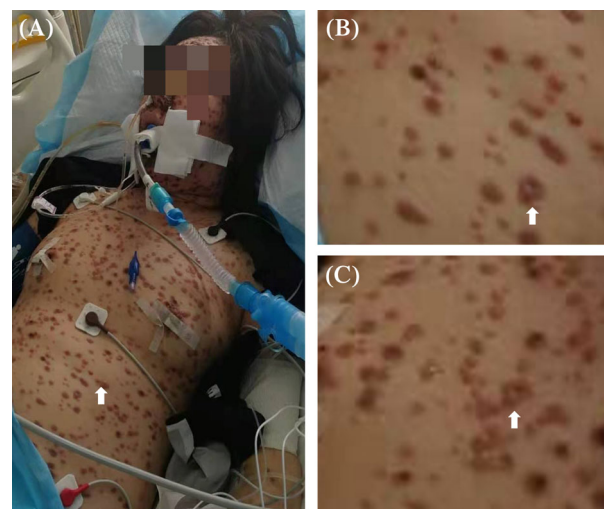
## KEYWORDS

computed tomography, pneumonia, varicella-zoster virus

## CLINICAL IMAGE

A 28 year old woman, presented with fever, dyspnea, and generalized rash (Figure 1). In 2 days, purple spots, some with blisters, appeared all over the body. Patient had undergone double kidney transplantation due to uremia which had lasted a year. There had been a significant increase in blood creatinine (Cr) (with the maximum Cr reaching 358  $\mu\text{mol/L}$ ) in the previous one month but she was diagnosed with acute rejection reaction after a renal biopsy. Methylprednisolone 500 mg qd for 5 days was administered. However, 3 days after methylprednisolone treatment, the above symptoms appeared and then the treatment was stopped. Computed tomography (CT) of the thorax showed multiple, diffuse, and symmetrically distributed ground-glass opacities (GGO) throughout the whole lungs (Figure 2). The lymphocyte subsets of this patient were: total T cells, 77/ $\mu\text{L}$ ;  $\text{CD4}^+$  T cells, 6/ $\mu\text{L}$ . Bronchoscopy with bronchoalveolar lavage fluids (BALFs) were collected and tested by Metagenomic Next-generation Sequencing (mNGS). The blood and skin blisters secretions were collected and tested by mNGS at the same time. mNGS reported *herpes simplex virus-3* (HSV-3; Varicella-zoster virus, VZV) in both BALFs

(quantities of sequence 1420), blood (quantities of sequence 94,552) and skin specimens (quantities of sequence 2,671,530). Skin biopsy showed local epidermal hyperplasia with excessive keratinization, formation of blister spaces in the spinous layer, cell degeneration, and a small amount of

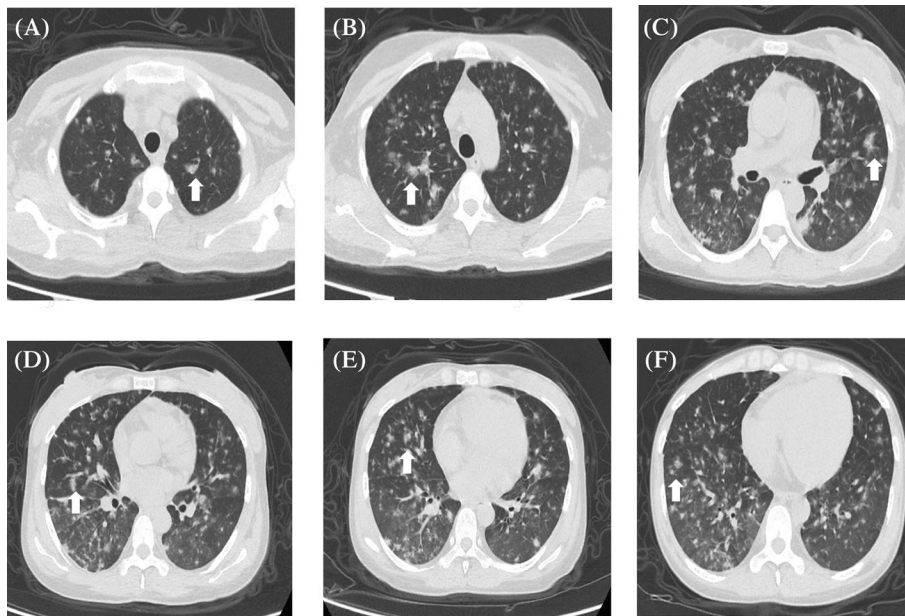


**FIGURE 1** Skin was covered with dark purple spots, some with blisters, all over the whole body (white arrow).

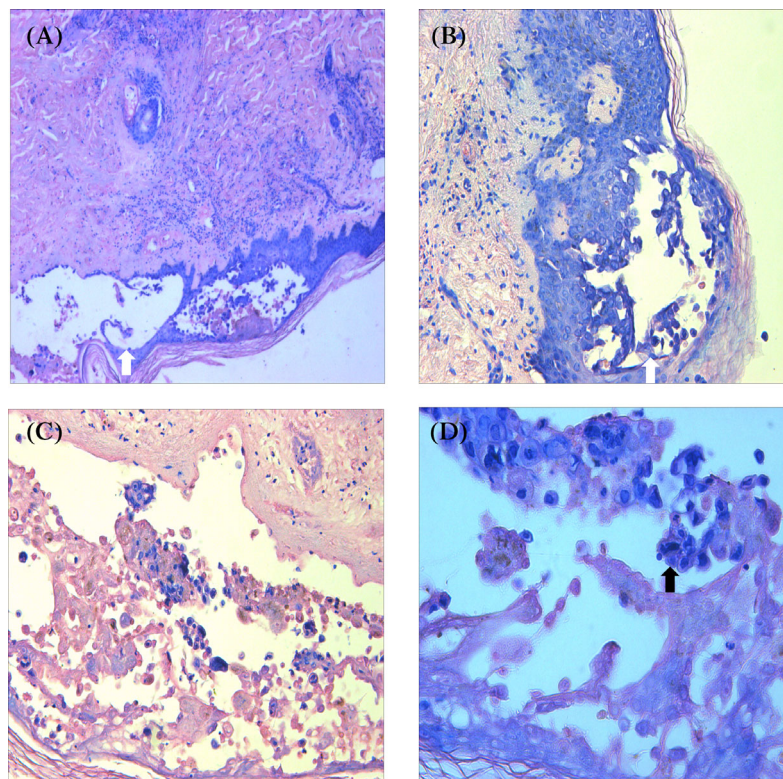
Minlong Zhang and Cuiping Yang have contributed to the article equally.

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial](https://creativecommons.org/licenses/by-nc/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

© 2023 The Authors. *Respirology Case Reports* published by John Wiley & Sons Australia, Ltd on behalf of The Asian Pacific Society of Respiriology.



**FIGURE 2** Computed tomography of the thorax in disseminated varicella zoster virus pneumonia showed multiple, diffuse, and symmetrically distributed ground-glass opacities (white arrow) throughout the whole lungs.



**FIGURE 3** Skin biopsy indicated that local epidermal hyperplasia with excessive keratinization, formation of blister spaces in the spinous layer (white arrow), cell degeneration, and a small amount of lymphocyte infiltration in the superficial dermis (black arrow).

lymphocyte infiltration in the superficial dermis (Figure 3). She was treated with acyclovir for VZV. Unfortunately, the patient eventually died with respiratory failure and septic shock.

## DISCUSSION

Disseminated VZV infections is rare in healthy adults. The probability of VZV reactivation and dissemination will

increase in immunocompromised populations.<sup>1,2</sup> Several studies have reported that VZV reactivation and eruption in the process of immuno-suppression happens especially in solid organ transplantation (SOT) patients. The reactivation of VZV could induce pneumonia, meningitis and multiple cranial nerve palsy.<sup>3,4</sup> Nonetheless, diffuse bilateral lung VZV infections is also rare. We report a case of disseminated VZV with pneumonia and generalized skin lesions after a renal transplantation and methylprednisolone treatment. The VZV virus was documented both in BALFs, blood and skin biopsy specimens. The computed tomography done demonstrated the imaging manifestations of disseminated VZV pneumonia.

#### AUTHOR CONTRIBUTIONS

Minlong Zhang and Yinghua Guo were the lead author involved in drafting the initial manuscript and preparing the images. Minlong Zhang and Cuiping Yang provided radiological expertise including interpretation and description of the images. All authors contributed to the writing, review and final approval of the manuscript.

#### CONFLICT OF INTEREST STATEMENT

None declared.

#### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

#### ETHICS STATEMENT

The authors declared that appropriate written informed consent was obtained for the publication of this manuscript and associated images.

#### ORCID

Minlong Zhang  <https://orcid.org/0000-0002-6900-3790>

#### REFERENCES

1. Gurevich I. Varicella zoster and herpes simplex virus infections. *Heart Lung*. 1992;21(1):85–91.
2. Feldman S. Varicella-zoster virus pneumonitis. *Chest*. 1994;106(1 Suppl): 22S–27S.
3. Kluger N, Puisto R, Suhonen J, Mazur W. Disseminated varicella zoster virus and herpes simplex virus co-infection in a lung-transplant recipient. *Ann Dermatol Venereol*. 2022;149(1):71–3.
4. Reza Hosseini O, Sørensen SS, Perch M, Ekenberg C, Møller DL, Knudsen AD, et al. Measles, mumps, rubella, and varicella zoster virus serology and infections in solid organ transplant recipients during the first year posttransplantation. *Clin Infect Dis*. 2021; 73(11):e3733–9.

**How to cite this article:** Zhang M, Yang C, Guo Y. Computed tomography manifestations of a case of varicella zoster virus (VZV) pneumonia. *Respirology Case Reports*. 2023;11:e01242. <https://doi.org/10.1002/rcr2.1242>