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Acute Necrotizing Herpetic Pleuritis in a Patient with Systemic Sclerosis and Immunosuppression: Report of a Novel Pulmonary Herpes Infection

To the Editor:

Herpes simplex virus-1 (HSV-1) is a highly contagious pathogen that causes pneumonia in immunocompromised adults.[1] Lung samples showing viral growth or positive immunohistochemical staining are confirmatory.[2]

HSV-1 infection of the pleura has not, to our knowledge, been described. We report a case of biopsy-proven HSV-1 pleuritis in a patient with systemic sclerosis (SSc).

CASE REPORT

A 72-year-old woman with SSc was admitted for muscle biopsy to evaluate possible myositis. After the biopsy, hypoxemia was noted. Three weeks prior, she began prednisone, 45 mg daily, for muscle weakness. Her SSc was complicated by interstitial lung disease and gastroesophageal reflux.

Physical examination revealed a blood pressure of 95/50 mm Hg with a heart rate of 92 beats per minute. The respiratory rate was 29 breaths per minute, and the oxygen saturation was 85% on room air. Temperature was 36.6°C. She had diminished breath sounds over the right chest and telangiectasias on her face and arms. Muscle power was normal. She required suctioning of purulent oropharyngeal secretions.

A chest radiograph revealed right-sided pneumothorax (**Figure 1A**). A thoracostomy tube was placed. Chest computed tomography (CT) revealed a right hydropneumothorax (**Figure 1B**). Complete blood count showed leukocytosis ($18.8 \times 10^3/mm^3$, 96.5% neutrophils).

Pleural fluid analysis demonstrated a lactate dehydrogenase level of 80,915 μg/L, a pH of 6.6, and 14,875 nucleated cells per mm^3, with neutrophilic predominance. Fluid culture revealed *Streptococcus intermedius*.

On hospital day 7, repeat CT showed consolidation of the right middle and lower lobes and a loculated pleural effusion (**Figure 1C**). Alteplase and dornase alfa were administered through the chest tube, with drainage of serosanguineous fluid. A follow-up CT scan showed decreased pleural fluid volume (**Figure 1D**).

On hospital day 10, she developed an air leak. She underwent video-assisted thoracoscopic surgery, with collapsed bullae at the right lung apex and a dense pleural attachment of the right lower lobe consistent with chronic empyema. Decortication, drainage of the empyema, and a wedge biopsy of the right upper lobe were performed.

Histopathology of the pleura revealed necrosis, with multinucleated cells (**Figure 2A and B**), and immunohistochemical staining for HSV-1 was strongly positive (**Figures 2C**). Acyclovir was started and on postoperative day 7, the air leak resolved.

DISCUSSION

We report a case of necrotizing HSV-1 pleuritis. Risk factors for HSV-1 infection were immunosuppression and spread to the lower airway through frequent oropharyngeal suctioning and aspiration of pharyngeal contents. The patient also had *S. intermedius* empyema and pneumothorax.

Pneumothorax is a rare manifestation of SSc and is probably due to rupture of subpleural cysts, with bronchopleural fistula formation. Pulmonary infections are common in patients with SSc because esophageal dysmotility predisposes to recurrent aspiration.[3] Our patient probably aspirated oropharyngeal secretions containing *S. intermedius*, resulting in pneumonia, rupture of underlying lung blebs, and empyema. HSV-1 followed the same route of transmission, resulting in HSV-1 pleuritis.

Empyema treatment consists of antibiotics and pleural fluid drainage.[4] Intrapleural administration of fibrinolytics may speed resolution, reducing the need for surgery.[5] Our patient's pleural disease did not resolve until acyclovir treatment, supporting our hypothesis that HSV-1 caused clinically relevant pleural infection.

Instrumentation or mechanical trauma of the airways may injure the airway mucosa and predispose to herpetic infection.[2] HSV-1 pleuritis should be considered a potential cause of pleural disease refractory to medical and surgical treatment of empyema or pneumothorax in susceptible patients.

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Requests for reprints should be addressed to David A. Kaufman, MD, Department of Internal Medicine, Section of Pulmonary, Critical Care and Sleep Medicine, Bridgeport Hospital, Yale-New Haven Health System, 267 Grant Street, Bridgeport, CT 06610.

E-mail address: David.Kaufman@ynhh.org

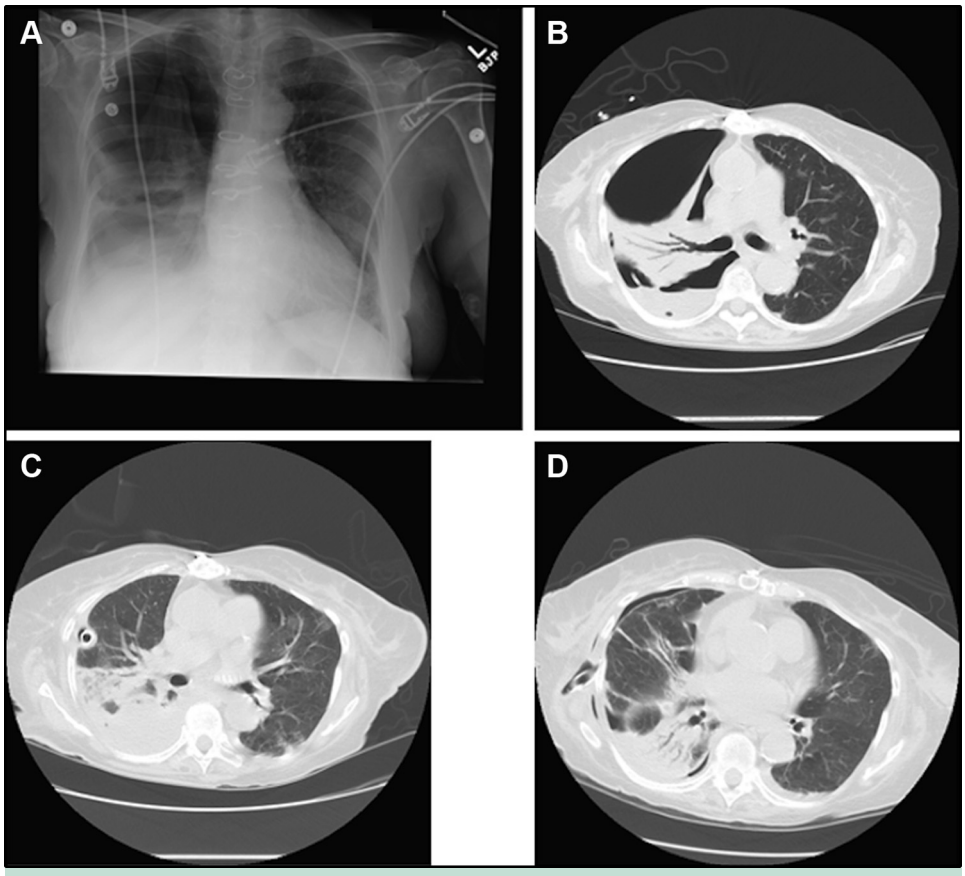

Figure 1 (**A**) Portable anteroposterior chest radiograph showing a large right pneumothorax with tethering of the apex of the lung to the chest wall. (**B**) Computed tomography (CT) of the chest on hospital day 1 shows large right hydropneumothorax with tethering of the lung to the chest wall. (**C**) CT scan of the chest on hospital day 7 shows marked decrease in the hydropneumothorax with persistence of middle and lower lobe consolidation. (**D**) Hospital day 10: decrease in hydropneumothorax with slight improvement in the amount of consolidated lung.

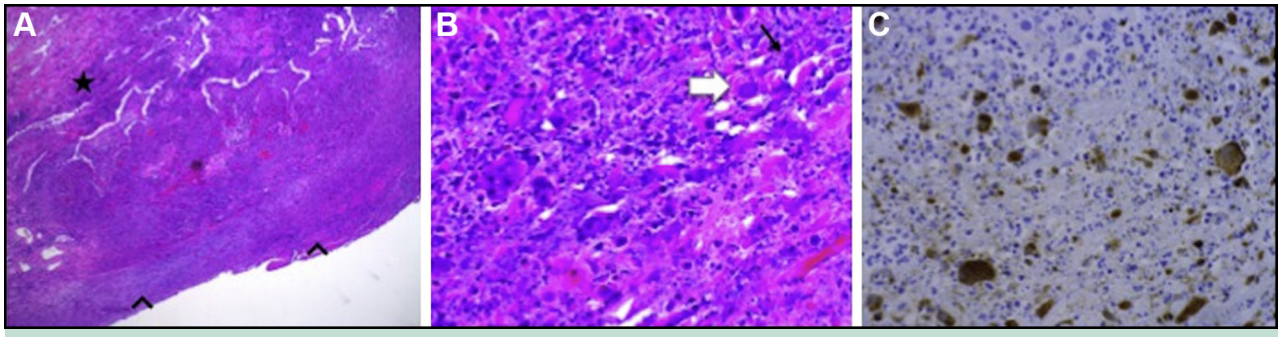

Figure 2 Histopathology of the pleura and lung parenchyma, right upper lobe. (**A**) Hematoxylin and eosin (H&E) staining showing pleural surface (open arrowheads) with subpleural inflammation (asterisk) and necrosis (area between open arrowheads and asterisk), 100×. (**B**) H&E staining with areas of necrosis and acute inflammation, intranuclear inclusions (black arrow), and multinucleated giant cells (white arrow), 400×. (**C**) Immunohistochemistry positive for herpes simplex virus 1, reflecting necrotizing herpetic pleuritis, 400×.

Despina Michailidou, MD[a]
James V. Lettera, MD[b]
Inga Forde, MD[c]
Paul J. Cohen, MD[d]
Armand J. Wolff, MD[e]
David A. Kaufman, MD[e,f]

[a]*Department of Internal Medicine, Bridgeport Hospital, Yale-New Haven Health System, Bridgeport, Conn*
[b]*Section of Cardiothoracic Surgery, Bridgeport Hospital, Yale-New Haven Health System, Bridgeport, Conn*
[c]*Section of Pulmonary, Critical Care and Sleep Medicine, Bridgeport Hospital, Yale-New Haven Health System, Bridgeport, Conn*
[d]*Department of Pathology, Bridgeport Hospital, Yale University School of Medicine, New Haven, Conn*
[e]*Department of Internal Medicine and Section of Pulmonary, Critical Care and Sleep Medicine, Bridgeport Hospital, Yale-New Haven Health System, Bridgeport, Conn*
[f]*Section of Pulmonary and Critical Care Medicine, Yale University School of Medicine, New Haven, Conn*

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