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Legionnaires’ disease was first described after a pneumonia outbreak among American legion members attending a convention in Philadelphia in July of 1976.1 To date, there are approximately 4000 reports in the literature describing the many different manifestations of Legionnaires disease.2 Legionnaires’ disease is a common cause of non-zoonotic atypical community-acquired pneumonia (CAP).3 The radiologic manifestations of Legionnaires’ disease are variable, but generally, infiltrates are often rapidly progressive and there is a lag in radiologic improvement compared with clinical improvement.

Legionnaires’ disease may also mimic other diseases because it may produce abscesses, cavitations, and even wedge-shaped opacities in immunosuppressed patients, mimicking pulmonary infarcts and embolism.4-7 Spontaneous pneumothorax may be associated with a variety of infectious and noninfectious disorders.8-14 Spontaneous pneumothorax is a rare presenting feature of Legionella CAP.15,16

To the best of our knowledge, this is the first report of bilateral spontaneous pneumothorax as the presenting radiological manifestation of Legionella CAP.

CASE REPORT

A 20-year-old man presented to the emergency department after he was found unresponsive. His family started cardiorespiratory resuscitation (CPR). He was intubated in transit to the hospital. His chest x-ray and chest computed tomography scan revealed bilateral pneumothoraces with...
patchy bibasilar infiltrates (Fig 1). Chest tubes were placed bilaterally, and the patient was transferred to the intensive care unit. On admission, he was febrile (101°F) and beginning to respond to verbal stimuli. His family denied any history of trauma or drug abuse. His physical examination was unremarkable except for chest findings associated with his bilateral pneumothoraces. Admission laboratory studies revealed a hypophosphatemia of 2 mg/dL (n = 2.7-4.7 mg/dL), an elevated creatine phosphokinase of 23,485 IU/L (n = 47-422 IU/L), and elevated liver enzymes, that is, a serum glutamate oxaloacetate transaminase of 282 IU/L (n = 13-39 IU/L), a serum glutamate pyruvate transaminase of 180 IU/L (n = 4-36 IU/L), and an alkaline phosphatase of 155 IU/L (n = 25-100 IU/L). Doxycycline 200 mg was administered intravenously every 12 hours. The patient’s condition improved during the next few days; he became afebrile and was extubated. Microbiological test results for typical and atypical CAP pathogens were negative, but his urine Legionella antigen test was positive. He completed 3 weeks of doxycycline therapy and had an uneventful recovery.

**DISCUSSION**

Pneumothorax is an accumulation of air in the pleural space and can be spontaneous or caused by a complication of trauma or medical procedures. Spontaneous pneumothorax mostly occurs in patients with underlying lung pathology. The most common noninfectious causes of spontaneous pneumothorax are related to lung diseases (eg, emphysema). Other less common pulmonary diseases include interstitial lung disease, connective tissue diseases (Marfan’s/Ehlers-Danlos syndrome), malignancy, histiocytosis X (Langerhan’s cell/eosinophilic granuloma), sarcoidosis, lymphangioleiomyomatosis, and endometriosis. The most common infectious causes of spontaneous pneumothorax are tuberculosis, necrotizing pneumonia, *Staphylococcus aureus* presenting with pneumatoceles (children), lung abscesses, *Pneumocystis (carinii) jiroveci* pneumonia, and severe acute respiratory syndrome. Septic pulmonary emboli (secondary to right-sided endocarditis) has also been reported to cause spontaneous unilateral pneumothorax. Spontaneous bilateral pneumothoraces are rare, but there has been a case report in a patient with rheumatoid lung (on steroids) infected with *Aspergillus sp*.

Unilateral spontaneous pneumothorax is a rare presenting feature of *Legionella* CAP. If there is no history or clinical findings of an underlying connective tissue disorders or lung disease, an infectious cause should be considered (Table 1).

The radiologic manifestations of Legionnaires’ disease are nonspecific, ranging from interstitial infiltrates to infiltrates with consolidation, and uncommonly cavitation or pleural effusions. Although there are no pathognomonic findings of *Legionella* CAP, infiltrates characteristically are basilar and rapidly progressive. Typically, the infiltrates of Legionnaires’ CAP progress despite adequate antibiotic therapy (Table 2). This case of spontaneous bilateral pneumothoraces as the presenting manifestation of *Legionella* CAP is unique. *Legionella* CAP was suspected on the basis of non-specific but characteristic extrapulmonary laboratory findings and the known association of pneumothorax with *Legionella*, which prompted specific diagnostic testing for *Legionella*.17-20

Because the patient’s CPR did not result in multiple rib fractures, his pneumothoraces should not be attributed to CPR. In cases of CPR with rib fractures, pneumothorax, if present at all, is unilateral and not bilateral. Therefore, we believe this to be the first reported case of spontaneous bilateral pneumothoraces caused by *Legionella* CAP. Clinicians should be aware that spontaneous pneumothorax is a rare presenting feature of *Legionella* CAP and may be unilateral or bilateral.
### Table I
**Differential diagnosis of spontaneous pneumothorax**

| Infectious causes | Noninfectious causes |
|-------------------|----------------------|
| **Common**        |                      |
| • TB              | • Emphysema          |
| • PCP (HIV)       | • Congenital blebs   |
| • *S. aureus* pneumatocoeles (children) | • Asthma (status asthmaticus) |
| • Histocytosis X (Langerhan’s cell/eosinophilic granuloma) | • Osseous sarcoma (metastatic to lungs) |
| **Uncommon**      |                      |
| • SARS            |                      |
| **Rare**          |                      |
| • Septic pulmonary emboli | • Endometriosis |
| • Legionnaire’s disease | • Lymphangioleiomyomatosis |

TB, Tuberculosis; PCP, Pneumocystic (carinii) jiroveci pneumonia; HIV, human immunodeficiency virus; SARS, severe acute respiratory syndrome.

### Table II
**Radiologic manifestations of Legionnaires’ disease**

| Common | Uncommon |
|--------|----------|
| • Unilateral patchy lower lobe infiltrates | • Wedge-shaped opacities |
| • Bibasilar patchy lower lobe infiltrates | • Cavitation (more common in immunocompromised hosts) |
| • Infiltrates with consolidation | • Abscesses |
| • Rapidly progressive asymmetric infiltrates (on appropriate anti-Legionella antibiotic therapy) | • Unilateral pneumothorax |
| • Pleural effusion (frequency increases as disease progresses) | |

Legionnaires’ community-acquired pneumonia: Cunha, Pherez, and Nouri

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