

# Lemierre Syndrome: A Common Presentation of an Uncommon Disorder

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Lemierre syndrome results from an acute bacterial oropharyngeal infection that causes septic thrombophlebitis of the internal jugular vein and frequent secondary metastatic infections. Also known as *necrobacillosis* and *postanginal septicemia*, the syndrome was initially described in 1900 by Courmont and Cade.<sup>1</sup> Lemierre, however, provided the first extensive review of cases and description of the syndrome.<sup>1</sup> Since the introduction of antibiotics, Lemierre syndrome has become an increasingly rare infectious disease. Nevertheless, it still occurs with sufficient regularity to warrant consideration by physicians, because its potential severity necessitates swift diagnosis and treatment.

This report presents the case of a 31-year-old man whose medical history and presentation were typical of Lemierre syndrome. The pathophysiology, clinical features, and management of the syndrome are also briefly discussed.

### CASE PRESENTATION

#### Presenting Symptoms

A 31-year-old man returned to our hospital's emergency department because of worsening pleuritic right-sided chest pain that radiated across the chest, into the neck, and to the right shoulder. The patient also reported nausea, vomiting, dyspnea, and diaphoresis. A review of systems revealed symptoms of weakness, night sweats, and mild dysphagia. The patient was admitted to the hospital.

#### History

The patient was without any health problems until 7 days previously, when he went to an urgent-care facility because of a sore throat and right ear pain. Physical examination at that time was significant for a right tonsillar exudate. After a diagnosis of streptococcal pharyngitis was reached (no rapid streptococcal antigen detection test or throat culture was performed), the patient was treated empirically with amoxicillin. The patient returned to the same facility the next day reporting difficulty swallowing and trouble breathing.

The patient was evaluated, found to have no active disease on chest radiography, and released without change to his treatment plan. Two days later, he first came to our hospital's emergency department reporting chest pain and dyspnea; associated symptoms included headache, neck pain, and fever. Physical examination at that time was significant for a temperature of 39.4°C (103°F). A chest radiograph (**Figure 1**) revealed a right-middle-lobe infiltrate. The patient's condition was subsequently diagnosed as community-acquired pneumonia, and he was released to home after his antibiotic was changed to clarithromycin.

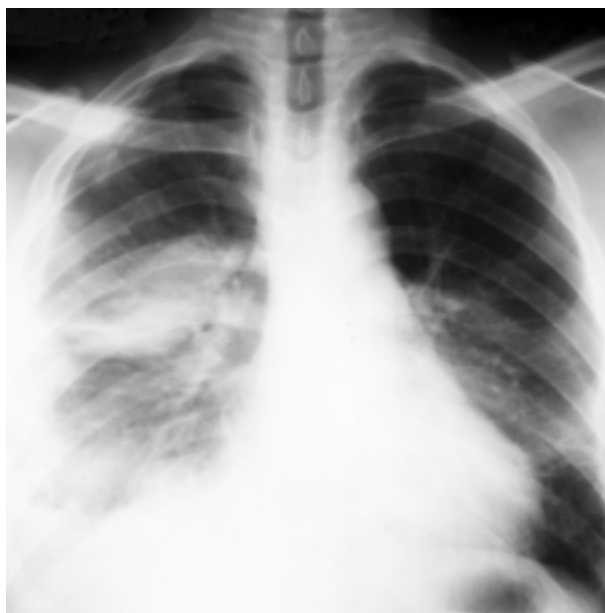
The patient's medical history included left knee surgery 5 years prior to admission and gonorrhea at age 18 years. He had no HIV risk factors, did not use tobacco or intravenously administered illicit drugs, and used alcohol and marijuana only occasionally. The patient had been on no medications other than the antibiotics previously mentioned.

#### Physical Examination

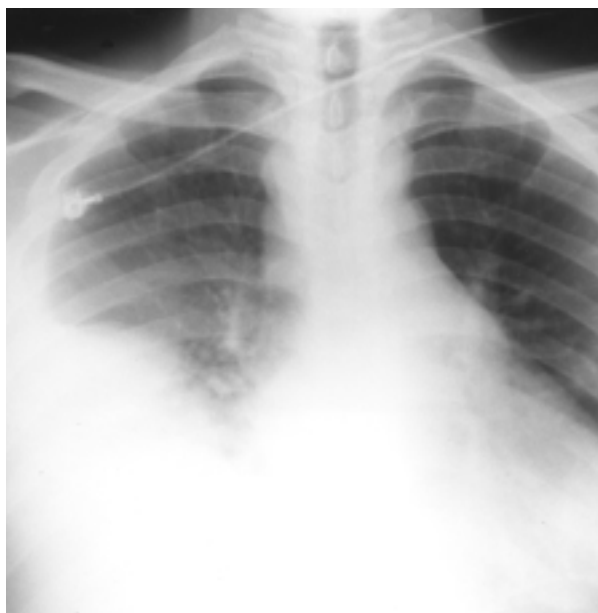
Current physical examination showed a well-nourished, well-developed young man in obvious distress. He was leaning forward for comfort and was diaphoretic. The patient had a temperature of 40°C (104°F), a blood pressure of 138/69 mm Hg, a pulse of 110 bpm, and a respiratory rate of 24 breaths/min. Pulse oximetry showed an oxygen saturation of 98% while the patient breathed through a nasal cannula (flow, 1 L/min). Specific examination findings included pharyngeal erythema, tenderness of the right sternocleidomastoid muscle on palpation, no lymphadenopathy, a poor inspiratory effort with decreased breath sounds at both lung bases, and a loud, diffuse pericardial friction rub. Auscultation of the chest revealed no S<sub>3</sub>, S<sub>4</sub>, or murmur.

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**Figure 1.** Chest radiograph showing a right-middle-lobe infiltrate 4 days prior to admission.



**Figure 2.** Chest radiograph showing a right pleural effusion on the day of admission.

### Laboratory Studies

Laboratory values on admission were as follows: leukocyte count,  $21.9 \times 10^3/\text{mm}^3$  (absolute number of polymorphonuclear leukocytes,  $18.2 \times 10^3/\text{mm}^3$ ); platelet count,  $212 \times 10^3/\text{mm}^3$ ; hemoglobin level, 15.0 g/dL; and serum lactate dehydrogenase level, 882 U/L. An electrocardiogram showed sinus tachycardia with diffuse ST elevation, consistent with pericarditis. A chest radiograph (**Figure 2**) was significant for a large right pleural effusion, which represented a profound change from the previous radiographs. Two-dimensional echocardiography showed a small pericardial effusion without evidence of tamponade.

### Treatment and Hospital Course

A diagnosis of community-acquired pneumonia and pericarditis was made, and the patient's antibiotics were changed to ceftriaxone and azithromycin, administered intravenously. The patient was admitted to a monitored bed. He subsequently underwent ultrasound-guided thoracentesis of a loculated right pleural effusion, which was confirmed on decubitus radiographs. Analysis of the pleural fluid was significant for a lactate dehydrogenase level of 35,438 U/L, a glucose level of 10 mg/dL, and a leukocyte count of  $22.05 \times 10^3/\text{mm}^3$  (96% polymorphonuclear leukocytes). Results of Gram stain of the pleural fluid were negative for any organisms. A purified protein derivative (tuberculin) skin test to detect tuberculosis, a VDRL test to detect syphilis, and additional lab-

oratory tests to detect HIV antibodies and antigens to legionella in urine were also all negative.

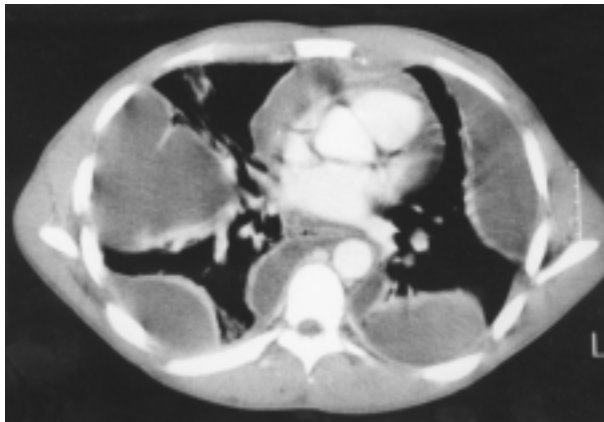
Within 24 hours of admission, the patient's condition worsened. A computed tomography (CT) scan of the thorax was ordered to further evaluate the complicated right pleural effusion and to aid in determining the appropriate drainage procedure(s). A CT scan scout film revealed severe compromise of lung volumes. A subsequent CT scan (**Figure 3**) revealed multiple bilateral loculated pleural effusions. The patient was taken urgently to the operating room for bilateral tube thoracostomy. Grossly purulent fluid was drained successfully. Pleural fluid cultures grew *Streptococcus viridans*, *S. intermedius*, *S. bovis*, and *Fusobacterium varium* ( $\beta$ -lactamase negative). During his subsequent hospital course, the patient required reinsertion of a chest tube (after recurrence of a loculated effusion) and pleural decortication.

On suspicion of Lemierre syndrome, duplex ultrasonography of the neck vessels was performed and confirmed the presence of a thrombus of the right internal jugular vein. Because the thrombus was assumed to be septic, the patient received 2 weeks of intravenously administered penicillin and 2 weeks of orally administered penicillin. He had a full recovery and remains in excellent health.

### DISCUSSION

#### General Considerations

Prior to the era of antibiotics, Lemierre syndrome resulted in fulminant sepsis and rapid death in the majority



**Figure 3.** Computed tomography scan of the thorax showing multiple loculated pleural effusions and pericardial involvement.

of patients with the disease.<sup>2</sup> Although now an infrequent entity, it still needs to be part of the differential diagnosis in patients whose history and symptoms are typical of the disorder, because rapid diagnosis and treatment will usually result in an excellent clinical outcome.

#### Pathophysiology

Lemierre syndrome primarily affects previously healthy adolescents and young adults. Typical features include a history of oropharyngeal infection; suppurative thrombophlebitis of the internal jugular vein; infection with anaerobic microbes, especially *F. necrophorum* (not the species infecting the case patient); and septic emboli that travel primarily to the lungs and large joints.<sup>2-9</sup> The pathophysiology of Lemierre syndrome involves the lateral pharyngeal space that includes the peritonsillar veins. A septic thrombophlebitis occurs in the peritonsillar veins and directly extends into the internal jugular vein. This thrombophlebitis is the source of septic emboli that travel primarily to the lungs and large joints. Classic physical examination findings include high fevers, lymphadenopathy along the angle of the jaw, and neck tenderness along the sternocleidomastoid muscle. A CT scan of the neck is the imaging study of choice to discover the pathognomonic internal jugular vein thrombus.

#### Management

In patients with Lemierre syndrome, therapy is directed toward eliminating *F. necrophorum*, a strictly anaerobic gram-negative bacillus; the infection, however, can be polymicrobial, involving anaerobes and streptococcal species. Increased documentation of  $\beta$ -lactamase-producing *Fusobacterium* species will most likely rule out penicillin G as the antibiotic of first choice.<sup>10</sup> Other

antibiotics that have been used successfully to treat Lemierre syndrome include clindamycin, metronidazole, cefoxitin, and chloramphenicol. A favorable response to treatment occurs, in most cases, within 2 to 6 weeks of initiating antibiotic therapy.<sup>5</sup> Ligation of the internal jugular vein is reserved for cases of recurrent septic emboli. Anticoagulation has not been shown to be necessary, unless there is propagation into the cavernous sinus.<sup>5</sup>

Although the case patient was initially treated with antibiotics, administered orally, the infection most likely had already spread to the lateral pharyngeal space and internal jugular vein. Consequently, intravenous administration of antibiotics was necessary.

#### SUMMARY

Although Lemierre syndrome is today a rare disorder, its presenting symptoms and signs are characteristic. This syndrome must be considered in previously healthy young adults with recent oropharyngeal infections who have fever, neck pain, and pulmonary symptoms. Appropriate and prompt antibiotic therapy is the treatment of choice for this potentially life-threatening infection.

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