Lemierre’s Syndrome Causing Cavitary Pulmonary Disease
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Citation

Abstract
A previously healthy 17-year-old female presented with fever, sore throat and lymphadenopathy. Initial management was directed at treating infectious mononucleosis, however, her condition did not improve. A CT scan of the chest indicated multifocal pneumonia. A subsequent CT scan of the neck revealed internal jugular vein thrombosis. A diagnosis of Lemierre’s syndrome was made after blood cultures returned positive for Fusobacterium necrophorum. Due to the initial delay in diagnosis she developed complications in the form of cavitary lung lesions which required Video Assisted Thoracic Surgery (VATS) for decortication.

INTRODUCTION
Jugular vein suppurative thrombophlebitis, also known as Lemierre’s syndrome, remains a rare disease with an incidence described as approximately one per million persons per year(1). Although rare, there is evidence of resurgence in the condition in recent years, possibly associated with decrease in use of antibiotic therapy for sore throats(2). Pharyngitis, usually in association with tonsillar or peritonsillar involvement, generally precedes the condition, but other antecedent conditions have been reported including primary dental infection and infectious mononucleosis(3). The infection spreads via a septic thrombophlebitis of the tonsillar vein and internal jugular vein. The ensuing bacteremia is complicated by septic emboli to a range of sites such as lung, joints, and bones. The typical clinical picture is characteristic but many clinicians are unaware of the condition and diagnosis is often delayed or even missed. The pulmonary cavitation complication rate is now decreasing with increased use of antibiotics(4).

CASE PRESENTATION
A 17-year-old previously healthy female presented to her pediatrician with cough and sore throat for the past three days while vacationing along the northwest coast. She was initially diagnosed with infectious mononucleosis and treated with supportive therapy. Unfortunately, her condition failed to improve and she presented to the emergency room with severe shortness of breath, odynophagia, left shoulder and neck pain as well as chest pain. Examination was significant for tonsillar enlargement, oropharyngeal erythema and right anterior cervical lymphadenopathy. Vital signs were significant for a fever of 101.2°F, tachycardia of 110 per minute and tachypnea of 22 per minute. The remaining physical examination was significant for accessory muscle use and bilateral coarse crackles. She was transferred to the intensive care unit for worsening shortness of breath requiring Bilevel Positive Airway Pressure (BPAP).

INVESTIGATIONS: Laboratory tests were significant for thrombocytopenia with a platelet count of 44000/µL, a white count of 24000/µL and lactic acid of 3 meq/L (normal range 0.5 - 2.2 meq/L). Initial chest x-ray(CXR) was suggestive of multifocal pneumonia(Figure 1).
Figure 1
Initial CXR showing multifocal pneumonia with bibasilar infiltrates

A CT scan of the chest showed multifocal consolidation and cavitary lesions as well as multiple nodules consistent with an atypical infection (Figure 2).

Figure 2
Admission CT Chest showing multifocal consolidation mostly in the left lower lobe and also multiple nodules in both lungs

Due to the unclear etiology of her multifocal cavitary lesions a CT scan of the neck was ordered to rule out a neck abscess. Surprisingly, the scan revealed a clot within the left internal jugular vein (Figure 3).
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Figure 3
CT neck showing Right Internal Jugular Vein thrombosis (white arrow)

On day three of admission blood cultures grew Fusobacterium necrophorum.

DIFFERENTIAL DIAGNOSIS: The diagnosis of Lemierre’s syndrome was made based on a constellation of signs and symptoms including a history of mononucleosis, the presence of an internal jugular vein clot, septic pulmonary emboli, and blood cultures consistent with F. necrophorum. Distinguishing features of Lemierre’s syndrome include the presence of generalized rather than purely cervical lymphadenopathy as noted with infectious mononucleosis, unilateral signs of internal jugular venous thrombosis with metastatic septic lesions and a markedly raised C-reactive protein. Due to the high level of pulmonary involvement, rapidly progressive lung lesions on radiography are often mistaken for acute bacterial pneumonia, Legionnaire’s disease, or aspiration pneumonia. Negative urinary legionella and streptococcal antigens decrease the likelihood legionnaires disease and multifocal pneumonia from streptococcus. Mycoplasmal infections rarely cavitate and are most often interstitial in nature. The presence of rapidly developing cavitory lung lesions can be mistaken for staphylococcal pneumonia or right sided staphylococcal endocarditis. However, this was less likely in the presence of negative sputum and blood cultures(5). Finally, with no obvious risk factors, aspiration pneumonia was less likely.

TREATMENT: She was started on intravenous ampicillin-sulbactam for three weeks. This was followed by amoxicillin-clavulinate for four weeks. During the course of her hospital stay, she underwent chest tube placement for loculated pleural effusions and dectrication via VATS. Anticoagulation was not initiated but repeat imaging was performed to ensure clot stability.

OUTCOME AND FOLLOW-UP: Her symptoms improved considerably on a three week follow up visit. A repeat CT scan of chest and neck (Figure 4) showed improvement in cavitory lesions and no progression of the internal jugular clot.

After completing a total of seven weeks of antibiotics she returned to college.

Figure 4
CT scan of the chest upon discharge showing considerable decrease in consolidative changes.

DISCUSSION
On initial presentation, our patient had findings suggestive of pharyngitis, right sided anterior cervical lymphadenopathy and shortness of breath. In a healthy adolescent or young adult, the single most common initial symptom of Lemierre’s syndrome is pharyngitis, usually followed by neck pain and development of multiple pulmonary abscesses (6). The onset of septicemia typically occurs four to five days after onset of sore throat and is heralded by a marked rise in fever to 39–41°C, often followed by rigors. The initial sore throat varies in severity
and may even improve with the onset of septicemia. Examination of the throat can vary from a normal appearance, mild tonsillar and/or pharyngeal inflammation, or even severe exudative tonsillitis with peritonsillar abscess. As seen in our case, patients often complain of associated neck and shoulder pain. Cervical lymphadenopathy may be present either unilaterally or bilaterally, often in the anterior triangle. In 26%–45% of cases there may be unilateral tenderness and swelling at the angle of the jaw, or anterior to the sternocleidomastoid muscle, reflecting the development of internal jugular venous thrombophlebitis(4). Additional local septic complications may occur including parapharyngeal and paratracheal abscesses(7).

Chest radiograph typically shows multiple nodular infiltrates scattered throughout both lung fields, small pleural effusions, and cavitary lesions may even be identifiable on early radiographs(8,9). Rapid development of pulmonary complications can lead to empyema in 10%–15% of cases(1). Adult respiratory distress syndrome occurs in a relatively small proportion of cases and fewer than 10% of cases reported in cited literature since 1990 have required mechanical ventilation.

The diagnosis of Lemierre’s syndrome is primarily clinical and should be entertained early when respiratory symptoms, significant neck swelling, or signs of toxicity occur in the week after an oropharyngeal infection. Common laboratory abnormalities include leukocytosis, thrombocytopenia, abnormal liver function, and an elevated C-reactive protein(10). F. necrophorum is a gram-negative anaerobic bacterium that is difficult to grow on routine culture media from throat swabs. Blood cultures grow the organism, but identification is delayed. Diagnoses are often made after the blood cultures become positive and complications have already occurred. Chest x-ray and CT scan imaging may show findings suggestive of multifocal pneumonia. Often a CT scan of the neck may show clot in the internal jugular vein of the affected side and also helps in ruling out the presence of an abscess.

Treatment is directed at oral anaerobes(4). Fusobacterium spp. have 100% sensitivity to metronidazole, beta lactamase resistant beta lactams, cefoxitin, and imipenem(11) and are resistant to gentamicin and quinolones. Duration of treatment is not well established, ranging from 9 to 84 days depending on severity and patient response. Patients are generally treated with intravenous antibiotics for two to three weeks until clinical improvement is seen, followed by oral treatment to complete a four to six week course. Persistent symptoms despite adequate antimicrobial coverage may suggest loculated abscesses or infectious foci. Any parapharyngeal or peritonsillar abscess, empyema, septic arthritis, or other cavitation should be drained(5,12).

Initiating anticoagulation is still a controversial subject that will require further investigation(13).

If Lemierre’s syndrome is promptly recognized and treatment with antibiotics is initiated, the overall prognosis is good. As our case demonstrated, however, morbidity can be significant in otherwise healthy, young patients.

Lemierre’s syndrome should be suspected in the setting of antecedent pharyngitis, septic pulmonary emboli, and persistent fever despite antimicrobial therapy. Delay in diagnosis may lead to cavitary lung lesions, respiratory failure as in our case and even death. Treatment consists of beta lactamase resistant beta lactam antibiotics for 4 to 6 weeks. The decision to anticoagulate is still controversial. Early suspicion and initiation of appropriate treatment may prevent morbidity and mortality associated with this severe illness.

References
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