

Lemierre's syndrome: An often missed life-threatening infection

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Abstract

Lemierre's syndrome is an uncommon, but fatal infection of the internal jugular vein (IJV) that is usually caused by *Fusobacterium necrophorum* although a wide range of bacteria has been reported as causative agents. Typical symptoms include fever, sore throat, neck swelling, pulmonary symptoms and arthralgia; however, the diagnosis of this infection is frequently overlooked as initial manifestation might be subtle and non-specific. Definite diagnosis requires positive blood culture and radiological evidence of thrombus in the IJV. We describe a case of a patient with Lemierre's syndrome who was initially misdiagnosed with viral upper respiratory tract infection. High index of suspicion is pivotal to the diagnosis of this infection and Lemierre's syndrome should always be considered as a potential cause of sepsis in an otherwise healthy patient.

Keywords: Anaerobic infection, fusobacterium, Lemierre's syndrome, postanginal sepsis

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Introduction

Lemierre's syndrome is a septic thrombophlebitis of the internal jugular vein (IJV) commonly caused by anaerobic oropharyngeal flora that is usually followed by fulminant sepsis and rapid death in the pre-antibiotic era. Since the introduction of antibiotics, the morbidity and mortality associated with this syndrome have been dramatically decreased. However, delay in diagnosis and antibiotic treatment resulting in poor clinical outcome is not uncommon as physicians are less familiar with this infection and initial manifestations are often non-specific. We describe a case of a patient with Lemierre's syndrome whose the diagnosis was not suspected until blood culture grew *Fusobacterium necrophorum*.

Case Report

An otherwise healthy 36-year-old male presented to our institute with a 4-day history of low-grade fever accompanied by sore throat, myalgia and nausea.

Physical examination was remarkable for a temperature of 38.1°C and an injected pharynx without any neck tenderness or swelling. Complete blood cell count showed thrombocytopenia with platelet of 45,000/uL, hemoglobin of 14.8 g/dL and cell count of 8700 cells/uL (neutrophil of 85% and band form of 6%). Blood chemistry was remarkable for elevated creatinine of 2.1 mg/dL. He was diagnosed with viral upper respiratory tract infection and was admitted to general medicine service for rehydration. He received 2 L of intravenous normal saline over night; however, on the 2nd day of hospitalization, he developed high fever of 39.2°C along with pleuritic chest pain and low blood pressure of 80/50 mmHg. He was transferred to Intensive care unit and resuscitated with intravenous fluids. Blood cultures were obtained and empirical antibiotics (vancomycin and piperacillin/tazobactam) were initiated. Chest X-ray revealed bilateral patchy and irregular parenchymal opacities and subsequent chest computed tomography demonstrated right-sided pleural effusion and multiple thick-walled cavitary and nodular opacities consistent with septic emboli [Figure 1]. His blood cultures grew *F. necrophorum* on the following day and his antibiotic therapy was narrowed down to piperacillin/tazobactam. He responded well to intravenous fluids and antibiotics. His blood pressure was normalized without using any vasopressor or mechanical ventilation (he received 5 L of intravenous

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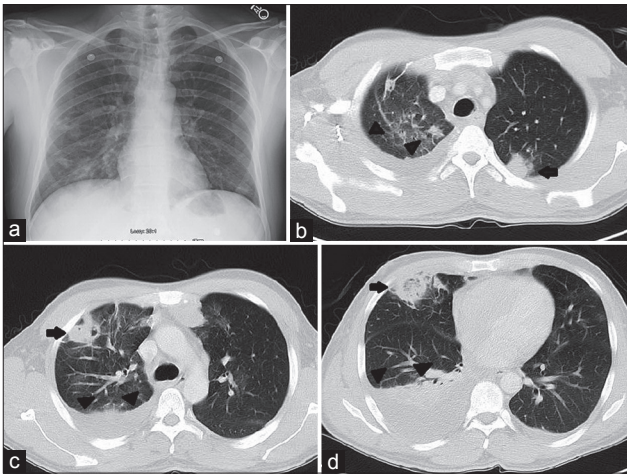


Figure 1: (a) Chest X-ray showed revealed bilateral patchy infiltration. (b-d) Chest computed tomography showed multiple thick-walled cavitary and solid nodules (arrows) and right-sided pleural effusion (arrow heads)

normal saline in total). Venous duplex ultrasonography was immediately obtained after the blood culture and demonstrated thrombus in the left IJV. Patient was finally diagnosed with Lemierre's syndrome and remained stable through rest of the hospital course. His pleural effusion was managed conservatively. Piperacillin/tazobactam was continued for 7 days and he was discharged home with a 4-week course of intravenous ertapenem and recovered well from the infection. He did not receive any anticoagulation during the course of his treatment.

Discussion

Lemierre's syndrome or postanginal sepsis is a rare, but potentially fatal infection of the IJV. It is usually caused by *F. necrophorum* although a wide variety of bacteria, including *Bacteroides*, *Eikenella*, *Porphyromonas*, *Prevotella*, *Proteus*, *Streptococcus*, *Peptostreptococcus* and *Staphylococcus aureus* has been reported as causative organisms. The infection typically starts in the palatine tonsils or peritonsillar tissue and spread into the IJV-containing lateral pharyngeal space though causing septic thrombophlebitis though infection originated from pharynx, middle ear, sinus and parotid gland has also been described.^[1] This septic thrombophlebitis is usually followed by distal septic embolization, resulting in multi-organ involvement with lung being the most commonly affected site with reported incidence of 97%.^[2] Other commonly involved sites are joints, muscle, soft-tissue, meninges, spleen and liver.^[3]

Why *F. necrophorum*, a normal inhabitant of human oropharynx, becomes invasive is unclear. Loss of pharyngeal mucosal integrity caused by bacterial or viral infection might play a major role as several cases of Lemierre's syndrome preceded by acute mononucleosis

have been reported. The increased production of leucotoxin is also pivotal for the pathogenesis as it can avidly activate platelet resulting thrombus formation in the IJV.^[4,5]

Lemierre's syndrome is classically described as a constellation of symptoms of fever, sore throat, neck swelling, pulmonary involvement and arthralgia that frequently affects young healthy adults.^[1] Nevertheless, initial clinical presentation can be subtle and sometimes persistent fever is the only prominent symptom and the syndrome is frequently not suspected until the microbiologic data is available hence high-level of clinical suspicion is needed for the timely diagnosis. Physical examination might reveal an exudative tonsillitis or milder form of pharyngitis; however, these oropharyngeal signs might not be evident as the septic thrombophlebitis or metastatic complication usually occurs 1-3 weeks after the primary infection. Typical signs of IJV thrombophlebitis are pain and swelling along the sternocleidomastoid muscle, but they are found in only approximately a half of patients.^[6]

Diagnosis of Lemierre's syndrome is established on the presence of thrombus in IJV and positive blood culture. Computed tomography of neck with contrast is the diagnostic modality of choice to demonstrate the thrombus. Doppler ultrasonography is an alternative since it is less invasive and can be done at bedside though it is less sensitive particularly in the area deep to clavicle and mandible and can miss newly formed thrombus with low echogenicity.^[4]

Prolonged course of Intravenous antibiotic (3-6 weeks) covering *F. necrophorum* and oral streptococci is the cornerstone of treatment. As beta-lactamase producing strain of *F. necrophorum* has been reported, beta-lactam alone is not generally recommended. Appropriate first-line antibiotics should be one of the following: beta-lactam/beta-lactamase inhibitor, carbapenem, ceftriaxone + metronidazole and clindamycin.^[1,7] The role of anticoagulation is unclear, but is generally not indicated unless there is evidence of expansion of the thrombus. Surgical ligation or excision of the IJV might be necessary in the case of uncontrolled sepsis or septic emboli despite adequate antibiotic.^[1,4]

Conclusion

We report a case of healthy young male who presented with flu-like symptoms and was initially mistaken for viral upper respiratory tract infection. Intensivists should have a high index of suspicion for this diagnosis in otherwise healthy young adult. History of preceding pharyngitis or evidence of septic emboli, especially to the lung may provide an additional clue to the diagnosis.

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