A Pain in the Neck: Lemierre Syndrome with an Atypical Pathogen

Ross Dies MD, Farhan Mohiuddin MD, Arati Joshi MD, Zunair Mohiuddin, Shane Guillory MD

Case presentation:

A 20-year-old female with history of post-traumatic stress disorder, adenoidectomy, and frequent childhood ear infections presented to the emergency department (ED) for shortness of breath over several hours. A week prior, she began having flu-like symptoms with subjective fevers. This subsequently progressed to upper back and neck pain, with associated decreased oral intake and emesis. Notably, she also endorsed sore throat and odynophagia. Vitals in the ED were significant for tachycardia, tachypnea, and mild desaturation on room air. Exam revealed posterior oropharyngeal erythema with leftward deviation of the uvula. Subsequent contrasted tomography (CT) of the neck revealed bilateral tonsillitis, left jugular vein thrombosis, and retropharyngeal edema. CT angiography of the chest revealed diffuse nodular opacities with central lucency, consistent with pulmonary septic emboli, as well as small bilateral pleural effusions. The patient was started on broad-spectrum antibiotic therapy and shortly after admission required the medical intensive care unit for acute hypercapnic hypoxic respiratory failure and septic shock in the setting of Lemierre syndrome. Blood and respiratory cultures speciated to *Arcanobacterium hemolyticum*. Fevers persisted despite proper antibiotic therapy. Evaluation for dural venous sinus thrombosis and endocarditis yielded negative results. Repeat chest imaging demonstrated worsening bilateral pleural effusions with bibasilar consolidations, as well as a new loculated pleural effusion in the left upper lung. Bilateral thoracostomy tubes were placed for administration of lytics, and thoracentesis was performed. Cultures from pleural samples never grew any pathogens. Eventually, she was able to be extubated and weaned off supplemental oxygen. Antibiotic de-escalation continued, and she was eventually discharged on Augmentin monotherapy.

Discussion:

Lemierre syndrome is a condition described as thrombophlebitis of the internal jugular vein secondary to a primary head and neck infection, extending into the lateral pharyngeal spaces of the neck. Also known as postanginal sepsis, it most commonly occurs in otherwise healthy adolescents and young adults. Subsequent release of septic emboli is very common, and the lungs are the most likely site for this to occur. Lung lesions may present as cavitary lesions, pleural effusions, empyema, abscess, or necrotizing mediastinitis. Other sites of spread include the spleen, liver, bone, joint, muscle, cardiac tissues, and brain. The classic pathogen is *Fusobacterium* species, more specifically *Fusobacterium necrophorum*; this gram-negative anaerobic bacterium has been shown to aggregate platelets in vitro. Other implicated agents include *Bacteroides* species, *Streptococcus* species, *Staphylococcus aureus*, and *Klebsiella pneumoniae*; up to one-third of infections are polymicrobial. *Arcanobacterium haemolyticum*, a gram-positive bacillus known for causing pharyngitis with a scarlatiniform rash, has also been implicated. Due to its similarities in presentation with scarlet fever and viral exanthems, along with difficulties isolating in culture, delays in diagnosis can be common. More aggressive infections such as endocarditis and septicemia are possible, but this is usually in elderly or immunosuppressed patients. There are few case reports of Lemierre syndrome in those with *A. haemolyticum*, and several of those that do exist involve co-infection with *F. necrophorum*. Cases with the bug isolated alone on blood culture in immunocompetent patients are very rare, and it has been found on the skin and in the oropharynx of healthy humans. There are no established regimens for treatment of *A. haemolyticum*, although it has often been shown to be susceptible to penicillin. Broad-spectrum antibiotics, including anaerobic coverage, are still recommended until culture sensitivities allow tailoring of therapy. Anticoagulation, although utilized occasionally in other forms of septic thrombophlebitis, has not demonstrated sure efficacy in Lemierre syndrome. It is usually reserved for accompanying dural venous sinus thrombosis, extensive clot burden, or failure to improve in 72 hours on appropriate therapy.