

Clinical Communications: Adults

DIAGNOSIS OF LEMIERRE SYNDROME BY BEDSIDE EMERGENCY DEPARTMENT ULTRASOUND

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□ **Abstract**—Oropharyngeal infections such as pharyngitis and odontogenic abscess are routinely encountered in emergency and primary care medical practice. Lemierre syndrome is a rare but serious complication of such infections. This syndrome is characterized by penetration of the primary infection into the lateral pharyngeal space, suppurative thrombophlebitis of the internal jugular vein, and metastatic infections resulting from septic emboli. A combination of clinical suspicion, microbiologic identification of the causative organism, and diagnostic imaging may be required to make the diagnosis. We present a case of Lemierre syndrome that was rapidly diagnosed in the Emergency Department with bedside ultrasound of the internal jugular vein. This case suggests that bedside ultrasound, performed before other radiologic imaging, may lead to earlier diagnosis and treatment of this syndrome, which historically has been associated with significant morbidity and mortality. © 2010 Elsevier Inc.

□ **Keywords**—Lemierre syndrome; thrombophlebitis; internal jugular vein; ultrasonography; septicemia

INTRODUCTION

Emergency and primary care physicians commonly encounter patients with oropharyngeal infections. The syndrome of suppurative thrombophlebitis of the internal jugular vein with subsequent septic embolism is an important complication of oropharyngeal infection first described by André Lemierre during the pre-antibiotic era (1).

Fusobacterium necrophorum, an anaerobic, Gram-negative bacillus that normally inhabits the oral cavity, is the most common etiologic agent. This infection carried a high mortality in Lemierre's time; only 4 of 20 patients in his review survived. In the modern era, the fulminant sepsis and dramatic mortality previously associated with this disease are rarely encountered. However, Lemierre syndrome continues to result in significant morbidity (2). Furthermore, sources report an increased incidence, partly as a consequence of pressure to avoid prescribing antibiotics for pharyngitis that is culture negative for group A streptococcus (3,4).

As with other forms of sepsis, early diagnosis of Lemierre syndrome and treatment with appropriate antibiotics may lead to improved outcomes. However, definitive treatment of this syndrome may also require anticoagulation or, rarely, ligation or resection of the internal jugular vein (5). These differences in therapy may require the expertise of several medical and surgical specialties, making timely diagnosis even more crucial. Unfortunately, it is difficult to recognize this complex illness in the Emergency Department (ED). Delays in diagnosis ranging from 2 to 11 days after admission have been reported (5–10). Diagnostic imaging can help to quickly identify the lesions characteristic of Lemierre Syndrome; most authors recommend contrast-enhanced computed tomography (CT) scan of the neck and chest (2,11–13). Although there are reports of using ultrasound to diagnose the thrombophlebitic element of this syn-

drome, none describe the use of bedside ultrasound in the ED for this purpose.

CASE REPORT

A 31-year-old male prisoner presented to the ED complaining of neck swelling and fever. Additionally, he had 3 days of sore throat, non-productive cough, neck pain, and difficulty swallowing. He reported progression of his symptoms despite initial treatment by a prison infirmary physician with cefazolin and, later, clindamycin combined with penicillin G. The patient denied headache, visual changes, toothaches, chest pain, hemoptysis, or shortness of breath. He had no history of immunodeficiency. His social history included incarceration for the past 4 years as well as prior alcohol and intravenous drug abuse. Current medications included thioridazine, tegretol, and the antibiotics mentioned previously.

Initial ED vital signs included a temperature of 38.4°C, heart rate of 94 beats/min, blood pressure of 117/68 mm Hg, respiration rate of 18 breaths/min, non-labored; and oxygen saturation of 86% breathing room air. The patient was mildly ill appearing, but not distressed; he sat on the gurney with his head in slight flexion and avoided moving his neck. There was no discernible stridor or muffling when the patient spoke. Examination of the oropharynx demonstrated only subtle fullness of the left palatoglossal and palatopharyngeal arches. These areas were otherwise symmetrical and without exudates. The left neck was moderately tender, but not erythematous or significantly swollen. Multiple discrete, tender lymph nodes along the posterior and anterior cervical chains were present. Breath sounds

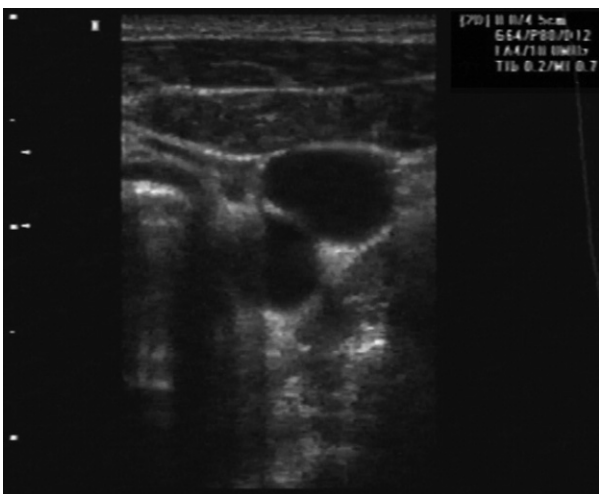


Figure 1. Sonographic view along the short axis of the right internal jugular vein and carotid artery. These structures appear normal.



Figure 2. Sonographic view along the short axis of the left internal jugular vein and carotid artery. There is concentric, echogenic material within the lumen of the vein as well as increased soft-tissue density separating the structures within the carotid sheath. These findings confirm the presence of thrombus within the internal jugular vein and surrounding inflammation.

were diminished in the left base, and crackles were auscultated in that region. The remainder of the patient's examination was normal.

A chest radiograph revealed a left pleural effusion, which appeared to layer on a decubitus view. A contrast-enhanced CT scan of the chest was ordered to further investigate the etiology of the pleural effusion, fever, and hypoxia. Before the CT scan, a bedside ultrasound of the neck was performed using a linear high-frequency (6.5–10 MHz) transducer to evaluate for a deep space infection. Part of this survey included visualization of the internal jugular veins and carotid arteries. The left internal jugular vein was markedly abnormal in appearance when compared to the contralateral side (Figures 1, 2). In particular, the vein was noted to be dilated, full of echogenic material, and deprived of blood flow, as demonstrated using color flow Doppler imaging.

As a result of these findings, the diagnosis of Lemierre syndrome was entertained and a contrast-enhanced CT scan of the neck was ordered in addition to the CT scan of the chest. The neck CT scan demonstrated considerable inflammatory reaction in the areas surrounding and posterior to the left common carotid artery and internal jugular vein. This inflammation extended from the mandible to the superior mediastinum (Figure 3). No definite thrombus was identified within the left internal jugular vein; however, no contrast material could be seen within the lumen as compared to the right. Based on these findings, the interpreting radiologist included Lemierre syndrome in his differential diagnosis. The CT scan of the chest

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