DANSK TIDSSKRIFT FOR AKUTMEDICIN

DANISH JOURNAL OF EMERGENCY MEDICINE

Dansk Tidsskrift for Akutmedicin

Vol. 9, No. 1

Accepted: 24 June 2026 | Published: 31 July 2026

DOI: 10.7146/akut.v9i1.166897

CASE REPORT

OPEN ACCESS

Atypical Lemierre's syndrome with pleural infection

Michael Dan Arvig [1,2,3]

[1]Akutafdelingen, Slagelse Sygehus, Slagelse, Danmark [2]RESCUE (Research Entity for Studies in Clinical Acute Medicine), Syddansk Universitet, Odense, Danmark [3]Københavns Universitet, København, Danmark

Korrespondance (*): doktorarvig@gmail.com

Abstract

A 25-year-old woman presented to the emergency department with dyspnea after recent sore throat and failed antibiotic treatment. Point-of-care lung ultrasound revealed consolidation and pleural effusion, and cultures grew *Fusobacterium necrophorum*. CT showed no thrombosis in the internal jugular vein. The case highlights atypical Lemierre's syndrome, the value of history-taking, point-of-care ultrasound, and early pleural aspiration.

Keywords: Lemierre's syndrome; Pleura infection, Fusobacterium necrophorum; Point-of-care ultrasound; Oropharyngeal symptoms; Internal jugular thrombosis

Introduction

Lemierre's syndrome (LS) is a rare condition with an annual incidence of 3.6 per million and typically affects teenagers and young adults [1]. LS often begins as an oropharyngeal infection and is complicated by thrombophlebitis of the internal jugular vein with spreading to other organs, commonly the lungs [2]. If not recognized and treated in a timely manner, it carries a high mortality [3].

In this case report, an atypical form of LS is described, highlighting diagnostic skills and targeted therapy in the emergency department (ED).

WHAT DO WE KNOW?

Lemierre's syndrome typically consists of throat symptoms, thrombosis of the internal jugular vein with hematogenous spread, most commonly to the lungs.

Case presentation

A 25-year-old previously healthy woman was admitted to the ED due to worsening dyspnea. Three weeks earlier, she had developed a sore throat. On evaluation by her general practitioner, she had dyspnea, cough, sputum, and a C-reactive protein (CRP) of 100 mg/L. Phenoxymethylpenicillin had been administered for five days but had no effect, and CRP continued to increase.

At arrival in the ED, she was alert. No dyspnea at rest or while speaking. Pneumonia or pleural infection was suspected. The vital signs were: Blood pressure 121/58 mmHg, pulse 145, respiratory rate 24, saturation 92% on room air, and temperature 39.1 °C. On physical examination, lung auscultation revealed reduced breath sounds and crackles at the right base.

Blood tests showed anemia (hemoglobin 4.5, considered unrelated to the infection), white blood count 17.2, thrombocytes 706, creatinine 43 µmol/L, normal bilirubin, and CRP 420 (**Table 1**). The arterial blood gas on room air revealed an acute respiratory alkalosis: PaO_2 12.0 kPa, pH 7.51, $PaCO_2$ 4.1 kPa, and normal bicarbonate and lactate (**Table 1**).

Parameter	Value[1]	Reference interval
Blood tests		
Hemoglobin	**4.5**	7.3–9.5 mmol/L
White blood cell count	**17.2**	3.5–8.8 x 10E9/L
Lymphocytes	1.4	1.3–3.5 x 10E9/L
Neutrophils	**14.9**	2.0–7.0 x 10E9/L
Thrombocytes	**706**	145–390 x 10E9/L
Potassium	**3.3**	3.5–4.6 mmol/L
Sodium	**135**	137–145 mmol/L
Creatinine	**43**	45–90 µmol/L
eGFR	> 90	> 60 mL/min/1.73 m^2
Urea	4.4	2.6–6.4 mmol/L
Bilirubin	10.0	5–25 µmol/L
Glucose	5.5	2.9–8.3 mmol/L
CRP	**420**	mg/L
Arterial blood gas		
pH	**7.51**	7.35–7.45
PaO_2	12.0	11.1–14.4 kPa
$PaCO_2$	**4.1**	4.5–6.2 kPa
O_2 saturation	0.99	0.95–0.99
Carbonmonoxyhemoglobin	**0.02**	< 0.02
Methemoglobin	0.01	< 0.02
Oxyhemoglobin	0.97	0.94–0.98
Bicarbonate (standard)	26	21–27 mmol/L
Base excess	2	-3–2 mmol/L
Lactate	1.2	0.5–1.6 mmol/L
O_2-flow	2.0	L/min

[1]Values outside the reference interval are highlighted in bold.

Point-of-care lung ultrasound showed right-sided basal lung consolidation, and a simple pleural effusion that extended into the upper part of the right hemithorax (**Figure 1**).

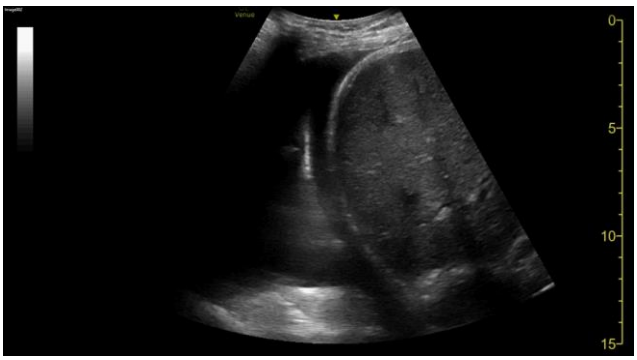

Figure 1. *Lung ultrasound image from the right basal lateral region showing a positive spine sign (visualization of the spine above the diaphragm), a simple pleural effusion without debris, septations, or loculations, and a lung consolidation.*

An ultrasound-guided diagnostic thoracentesis was performed, yielding clear fluid with a pH of 7.15, indicating a high risk of pleural infection. Therefore, a small-bore chest tube (14F) was inserted under ultrasound guidance. Empirical treatment with cefuroxime and metronidazole was initiated, and the patient was transferred to a specialized ward for intrapleural saline flushing. Later, cultures identified *Fusobacterium necrophorum*. Subsequent CT of the neck and thorax showed no internal jugular thrombosis or septic pulmonary emboli. The patient was discharged one week later continued oral antibiotics, with outpatient follow-up.

Discussion

This case report illustrates four important clinical considerations for the ED physician:

First, the importance of a thorough medical history. Although the initial presentation was dominated by pulmonary findings, the preceding oropharyngeal symptoms provided an important clue to the underlying diagnosis of LS and helped guide subsequent evaluation and treatment.

Second, jugular vein thrombosis is not required in LS [2], but isolation of *Fusobacterium,* together with prior oropharyngeal and subsequent lung symptoms, should prompt CT of the neck to assess for thrombosis. Although anticoagulation remains controversial, it may be indicated in progressive thrombosis [3,4]. However, antibiotic therapy is still the cornerstone of treatment for both LS and pleural infection [4].

Third, point-of-care lung ultrasound rapidly identified a consolidation and pleural effusion and facilitated diagnostic thoracocentesis.

PERSPECTIVES

1. Awareness of possible Lemierre's syndrome in patients with preceding sore throat, subsequent pulmonary symptoms, and either thrombosis of the internal jugular vein or isolation of Fusobacterium necrophorum.
2. The importance of medical history in acute visits.
3. The role of point-of-care ultrasound both as a diagnostic tool and in procedural guidance.

Fourth, when a pleural effusion is identified, the decision is whether diagnostic thoracentesis alone is sufficient or therapeutic thoracentesis is required for symptom relief. The choice should be based on the patient's clinical status and current guidelines for pleural infection, which emphasize that even a simple pleural effusion may represent an early stage of empyema and should not be considered uncomplicated based on its appearance alone [5].

In summary, this case highlights that LS should be considered in young, previously healthy patients with recent oropharyngeal symptoms who fail to improve as expected and subsequently develop systemic illness or lower respiratory tract involvement.

WHAT DOES THE PAPER ADD?

Lemierre's syndrome may occur without thrombosis, but with identification of Fusobacterium necrophorum instead.

Conflicts of interest

The author declares no conflicts of interest.

Funding

None.

References

1. Hagelskjaer Kristensen L, Prag J. Lemierre's syndrome and other disseminated Fusobacterium necrophorum infections in Denmark: a prospective epidemiological and clinical survey. Eur J Clin Microbiol Infect Dis. 2008;27(9):779-89. doi:10.1007/s10096-008-0496-4.

2. Riordan T. Human infection with Fusobacterium necrophorum (necrobacillosis), with a focus on Lemierre's syndrome. Clin Microbiol Rev. 2007;20(4):622-59. doi:10.1128/CMR.00011-07.

3. Gore MR. Lemierre syndrome: a meta-analysis. Int Arch Otorhinolaryngol. 2020;24(3):e379-e385. doi:10.1055/s-0039-3402433.

4. UpToDate. Lemierre syndrome: septic thrombophlebitis of the internal jugular vein [Internet]. Waltham (MA): UpToDate; [cited 2026 Mar 24]. Available from: https://www.uptodate.com/contents/lemierre-syndrome-septic-thrombophlebitis-of-the-internal-jugular-vein