Severe peritonsillar/ parapharyngeal abscess mimicking Lemierre syndrome without ınternal jugular vein thrombosis: An emergency department case report

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ABSTRACT

Background: Lemierre syndrome is a rare but potentially life-threatening condition classically characterized by recent oropharyngeal infection, septic thrombophlebitis of the internal jugular vein, and septic embolization. However, severe deep neck infections may occasionally present with clinical features that mimic Lemierre syndrome, even when internal jugular vein thrombosis, septic embolization, and positive cultures are absent.

Case Presentation: A 21-year-old previously healthy man presented to the emergency department with altered mental status following a two-week history of sore throat. Fever, chills, dyspnea, and confusion had developed within the previous 24 hours. On admission, he was febrile, tachypneic, confused, and poorly cooperative. Laboratory investigations revealed neutrophilic leukocytosis and elevated inflammatory markers. Contrast-enhanced neck computed tomography demonstrated a right-sided peritonsillar/parapharyngeal abscess measuring 18 × 28 × 54 mm with obliteration of the parapharyngeal fat planes. However, no evidence of internal jugular vein thrombosis or septic pulmonary embolism was identified. The patient was admitted to the intensive care unit and treated with intravenous piperacillin–tazobactam therapy. Surgical drainage and tonsillectomy were subsequently performed. Blood and abscess cultures remained negative. The patient showed progressive clinical improvement and was discharged on the 21st hospital day without neurological sequelae or other complications.

Conclusion: This case highlights a severe deep neck infection with Lemierre-like clinical features but without radiologically detectable internal jugular vein thrombosis, septic embolization, or positive cultures. Therefore, the case should not be interpreted as classical Lemierre syndrome, but rather as a Lemierre-mimicking presentation requiring early imaging and prompt treatment. Emergency physicians should maintain clinical suspicion for Lemierre syndrome in young patients presenting with prolonged sore throat, deep neck infection, and systemic toxicity even in the absence of classical radiological findings. Early imaging and prompt antimicrobial treatment remain essential for reducing morbidity and potentially fatal complications.

Keywords: Lemierre syndrome, deep neck infection, emergency department, internal jugular vein thrombosis, peritonsillar abscess.

Type of Article: CASE REPORT **Specialty:** Emergency Medicine

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Background

Lemierre syndrome is a rare but potentially life-threatening septic thromboembolic complication that typically follows an oropharyngeal infection. It is classically characterized by septic thrombophlebitis of the internal jugular vein, anaerobic bacteremia most commonly associated with *Fusobacterium necrophorum*, and metastatic septic emboli, particularly to the lungs [1,2]. Although it predominantly affects adolescents and young adults, its early clinical presentation may mimic uncomplicated pharyngitis, deep neck infection, meningitis, or nonspecific sepsis, making early recognition challenging in the emergency department [2,3].

Despite the availability of modern antibiotics and advanced imaging, Lemierre syndrome remains clinically important because delayed diagnosis may result in severe complications, intensive care admission, and mortality. Contemporary reviews report that mortality has decreased compared with the pre-antibiotic era but remains clinically relevant, generally ranging from approximately 4% to 9% in recent series and meta-analyses [3,4]. Therefore, persistent or worsening sore throat accompanied by systemic toxicity, respiratory symptoms, neurological findings, or deep neck space infection should prompt consideration of Lemierre syndrome.

Internal jugular vein thrombosis is considered a hallmark of classical Lemierre syndrome; however, atypical or

incomplete presentations have increasingly been reported. In some patients, thrombosis may be absent, not yet radiologically detectable, or involve alternative venous structures, creating diagnostic uncertainty [2,5]. We present a severe peritonsillar/parapharyngeal abscess with systemic toxicity and altered mental status that mimicked Lemierre syndrome but lacked radiologically detectable internal jugular vein thrombosis, septic embolization, and culture positivity. The novelty of this case does not lie in defining a new variant of Lemierre syndrome, but in highlighting the diagnostic overlap between severe deep neck infection and Lemierre syndrome in the emergency department.

Case Presentation

A 21-year-old male patient was brought to the emergency department with altered mental status. According to the history obtained from his relatives, he had experienced a sore throat for approximately two weeks, and fever, chills, dyspnea, and confusion had developed within the previous 24 hours. He had no known chronic disease, regular medication use, or history of immunosuppression. It was learned that he had not received any regular treatment for his symptoms prior to admission.

On presentation to the emergency department, his vital signs were as follows: body temperature 39.2°C, blood pressure 102/53 mmHg, heart rate 101 beats/minute, respiratory rate 28/minute, and oxygen saturation 95% on room air. The Glasgow Coma Scale score was 12. Physical examination revealed an anxious, confused, disoriented, and poorly cooperative patient. Neck stiffness and meningeal irritation signs were absent. Oropharyngeal examination was suboptimal because of limited patient cooperation. Although no obvious tonsillar abscess formation was visualized, fullness in the right parapharyngeal region was noted. Neurological examination demonstrated no lateralizing motor deficit.

Laboratory investigations revealed a leukocyte count of 14,850/μL with neutrophil predominance. Platelet count was 390,000/μL. C-reactive protein level was 12 mg/L, while the procalcitonin level was measured at 0.48 ng/mL. Serum biochemical parameters and coagulation tests were unremarkable. Cerebrospinal fluid analysis showed no evidence of central nervous system infection.

Contrast-enhanced neck computed tomography demonstrated a collection extending inferiorly from the right peritonsillar region toward the oropharynx, obliterating the parapharyngeal fat planes, measuring approximately 18 × 28 × 54 mm, with central hypodensity and peripheral contrast enhancement. These findings were considered compatible with a peritonsillar/parapharyngeal abscess (Figure 1). However, no radiological evidence of internal jugular vein thrombosis was identified (Figure 2). Thoracic imaging revealed no evidence of septic pulmonary embolism.

The patient was admitted to the intensive care unit for close monitoring. Empirical broad-spectrum intravenous piperacillin–tazobactam therapy was initiated. Surgical drainage and tonsillectomy were subsequently performed under general anesthesia by the otorhinolaryngology team. Blood cultures were obtained during the initial evaluation; however, the exact number of culture sets and whether they were collected before antibiotic administration could not be confirmed from the available medical record. Abscess material obtained during surgical drainage was sent for microbiological culture. Blood and abscess cultures remained negative. Specific documentation regarding anaerobic culture processing and targeted identification of *Fusobacterium* species was not available. During clinical follow-up, progressive improvement in mental status and systemic findings was observed. The patient responded well to antibiotic therapy and was discharged on the 21st day of hospitalization without neurological sequelae or other complications.

Despite the coexistence of oropharyngeal infection, deep neck infection, and systemic toxicity, the absence of demonstrable internal jugular vein thrombosis led us to consider a Lemierre-like clinical presentation.

Discussion

Lemierre syndrome is a rare but potentially life-threatening condition that classically develops following an oropharyngeal infection and is characterized by septic thrombophlebitis of the internal jugular vein and metastatic septic embolization [1,2]. The syndrome predominantly affects previously healthy adolescents and young adults and is most commonly associated with *F. necrophorum* infection [1]. Although mortality rates have significantly decreased in the antibiotic era, recent studies still report mortality rates ranging between approximately 4%

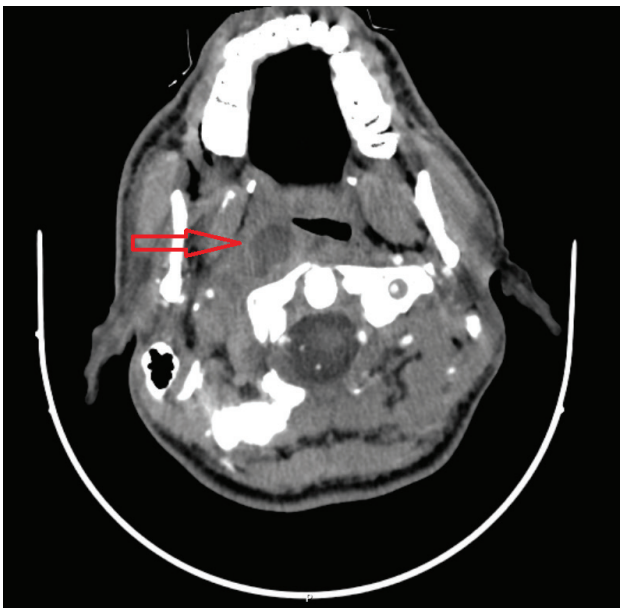

Figure 1. *Contrast-enhanced neck computed tomography demonstrating a right-sided peritonsillar/parapharyngeal abscess without evidence of internal jugular vein thrombosis.*

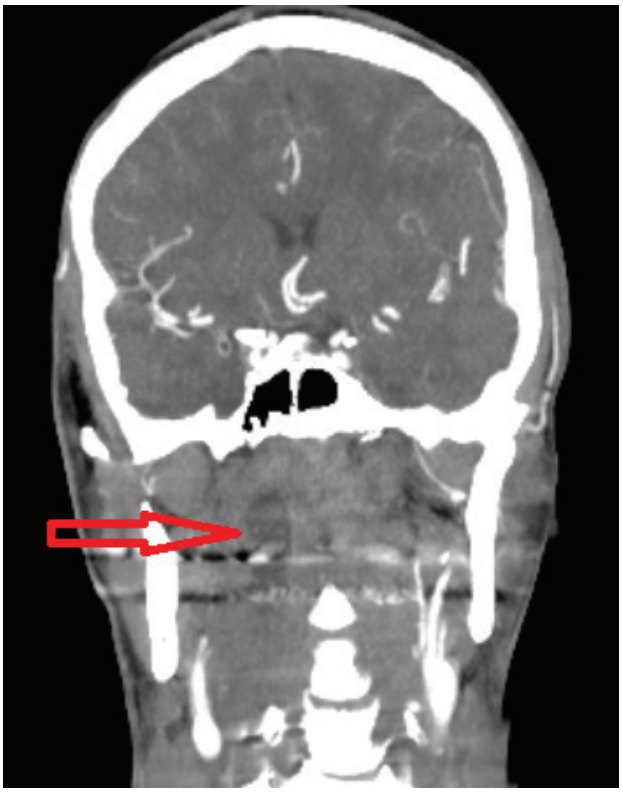

Figure 2. *Contrast-enhanced coronal neck computed tomography revealing a right-sided deep neck abscess with parapharyngeal extension (red arrow) and preserved patency of the internal jugular vein.*

and 9%, emphasizing the importance of early recognition and prompt treatment [3,4].

Internal jugular vein thrombosis is traditionally considered one of the hallmark findings of Lemierre syndrome. However, atypical or incomplete forms lacking radiologically demonstrable thrombosis have increasingly been described in the literature [2,5]. Some authors have referred to these cases as "Lemierre-like syndrome" or "non-thrombotic Lemierre syndrome" [5]. In the present case, despite the coexistence of prolonged oropharyngeal symptoms, deep neck infection, systemic toxicity, and altered mental status, no evidence of internal jugular vein thrombosis was identified on contrast-enhanced computed tomography. This finding complicated the diagnostic process and broadened the differential diagnosis.

Classical Lemierre syndrome is generally defined by a recent oropharyngeal infection complicated by septic thrombophlebitis of the internal jugular vein and metastatic septic embolization. In the present case, although prolonged sore throat, systemic toxicity, altered mental status, and a peritonsillar/parapharyngeal abscess raised clinical suspicion for Lemierre syndrome, the absence of radiologically detectable internal jugular vein thrombosis, septic embolization, and positive cultures indicates that the case does not fulfill the classical diagnostic criteria. Therefore, this case is better interpreted as a severe deep neck infection with Lemierre-like clinical features rather than definite Lemierre syndrome. The clinical value of this case is not that it proves a non-thrombotic variant of Lemierre syndrome, but that it illustrates how a severe deep neck infection may mimic Lemierre syndrome during emergency department evaluation. Given these findings, an alternative and probably more conservative classification of the present case is severe peritonsillar/parapharyngeal deep neck infection with systemic inflammatory response/sepsis. We therefore use the term "Lemierre-like clinical features" only to describe the initial diagnostic concern in the emergency department, not to establish a definitive diagnosis of Lemierre syndrome.

The diagnosis of Lemierre syndrome may be challenging in the emergency department because the initial manifestations are often nonspecific and may mimic uncomplicated upper respiratory tract infection, meningitis, encephalitis, or sepsis of unknown origin [2,6]. In our patient, altered mental status and systemic inflammatory findings initially raised concern for central nervous system infection. However, cerebrospinal fluid analysis was unremarkable, and subsequent imaging revealed a deep neck space infection. Emergency physicians should therefore maintain a high index of suspicion in young patients presenting with persistent sore throat accompanied by systemic toxicity, respiratory symptoms, neurological findings, or neck swelling [2,6]. Culture negativity was another factor limiting a definitive diagnosis of classical Lemierre syndrome in this case. Negative cultures may occur because of prior antibiotic exposure, delayed sampling, suboptimal anaerobic transport conditions, or the fastidious nature of anaerobic organisms such as *Fusobacterium* species. Therefore, the absence of microbiological confirmation further supports a cautious interpretation of this case as a severe deep neck infection with Lemierre-like clinical features rather than definite Lemierre syndrome.

Imaging plays a critical role in the diagnosis of Lemierre syndrome and associated deep neck infections. Contrast-enhanced neck computed tomography is considered the preferred imaging modality because it allows simultaneous evaluation of deep neck spaces, abscess formation, and venous thrombosis [2,7]. Nevertheless, the absence of radiologically detectable thrombosis does not completely exclude the diagnosis, particularly during early disease stages or partially treated infections [5,7]. In some atypical cases, thrombosis may involve smaller venous branches or remain below the detection threshold of imaging modalities [5]. In our patient, computed tomography clearly demonstrated a peritonsillar/parapharyngeal abscess extending into the deep neck spaces while the internal jugular vein remained patent.

Broad-spectrum antimicrobial therapy with adequate anaerobic coverage remains the cornerstone of treatment [1,2]. Recommended empirical regimens include beta-lactam/beta-lactamase inhibitor combinations, carbapenems, or ceftriaxone combined with metronidazole [2,8].

Surgical drainage is frequently required in patients with significant abscess formation, airway compromise, or inadequate response to medical therapy [2]. In the present case, the patient demonstrated marked clinical improvement following intravenous piperacillin–tazobactam therapy and surgical drainage with tonsillectomy.

The role of anticoagulation in Lemierre syndrome remains controversial [8,9]. While some authors advocate anticoagulation in patients with thrombus propagation, persistent septic embolization, or cerebral venous involvement, there is currently insufficient evidence supporting routine anticoagulant therapy in all patients [8,9]. Since no radiologically visible internal jugular vein thrombosis or septic embolic complication was identified in our patient, anticoagulation therapy was not administered.

Recent literature increasingly recognizes atypical and non-thrombotic presentations of Lemierre syndrome [5,10]. Similar to previously reported cases, our patient presented with severe systemic findings despite the absence of demonstrable internal jugular vein thrombosis. This case highlights an important diagnostic pitfall for emergency physicians: the absence of classical radiological findings should not prematurely exclude the possibility of Lemierre-like syndrome in patients with severe oropharyngeal infection and systemic toxicity.

Conclusion

This case demonstrates that severe peritonsillar/parapharyngeal abscess may mimic Lemierre syndrome in young patients presenting with prolonged sore throat, systemic toxicity, and altered mental status. However, the absence of internal jugular vein thrombosis, septic embolization, and culture positivity argues against classical Lemierre syndrome. Early contrast-enhanced imaging, prompt broad-spectrum antimicrobial therapy, airway assessment, and timely surgical drainage are essential in the management of severe deep neck infections.

What is new?

Lemierre syndrome is a rare but potentially life-threatening condition typically characterized by recent oropharyngeal infection, internal jugular vein thrombosis, and septic embolization. Early diagnosis may be challenging because the initial clinical presentation can mimic common upper respiratory tract infections or nonspecific sepsis. This manuscript presents a severe peritonsillar/parapharyngeal abscess with Lemierre-like clinical features in a young patient presenting with altered mental status and deep neck infection in the emergency department. The case emphasizes that the absence of classical radiological findings does not exclude the diagnosis and highlights the importance of early clinical suspicion and prompt treatment in atypical presentations.

Conflict of interest

The authors declare that they have no conflict of interest regarding the publication of this case report.

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Ethics approval and consent to participate

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

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Summary of case

1	Patient (gender, age)	Male, 21 years
2	Final Diagnosis	Severe right peritonsillar/parapharyngeal abscess with Lemierre-like clinical features, without internal jugular vein thrombosis or septic pulmonary embolism
3	Symptoms	Two-week history of sore throat, fever, chills, dyspnea, confusion, and altered mental status
4	Medications	Intravenous piperacillin–tazobactam
5	Clinical Procedure	Contrast-enhanced neck computed tomography, surgical drainage of the abscess, and tonsillectomy under general anesthesia
6	Specialty	Emergency Medicine