

## “Lemierre’s Syndrome Complicating an Untreated Oropharyngeal Infection in a Young Adult: A Case Report”

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Date of Submission: 25-05-2026

Date of Acceptance: 02-06-2026

### Abstract Background

Lemierre’s Syndrome is a rare but potentially life-threatening condition characterized by septic thrombophlebitis of the internal jugular vein following oropharyngeal infection. It commonly affects young adults and is most frequently caused by *Fusobacterium necrophorum*. Early diagnosis and prompt antibiotic therapy are essential to prevent severe complications such as septic emboli and respiratory failure.

### Case Presentation

A 24-year-old male presented with high-grade fever, severe sore throat, neck swelling, dysphagia, and breathlessness following an untreated throat infection for one week. The patient had initially experienced throat pain and fever a few days earlier and had taken self-medication with over-the-counter drugs without antibiotic therapy. Clinical examination revealed tender swelling over the right side of the neck with restricted neck movements and respiratory involvement. Laboratory investigations showed leukocytosis and elevated inflammatory markers.

Contrast-enhanced Computed Tomography (CECT) of the neck demonstrated thrombosis of the right internal jugular vein with surrounding soft tissue inflammation, while chest CT revealed multiple bilateral septic pulmonary emboli. Blood culture isolated *Fusobacterium necrophorum*, confirming the diagnosis of Lemierre’s Syndrome.

The patient was managed with intravenous broad-spectrum antibiotics, anticoagulation therapy, intravenous fluids, oxygen support, and supportive care. Gradual clinical improvement was observed during hospitalization, and the patient was discharged on oral antibiotics and anticoagulants with advice for regular follow-up.

### Conclusion

Lemierre’s Syndrome should be considered in

young patients presenting with persistent fever, neck swelling, and respiratory symptoms following recent oropharyngeal infection.

Early imaging, microbiological diagnosis, and aggressive antimicrobial therapy are crucial for successful management and prevention of life-threatening complications.

### Keywords

Lemierre’s Syndrome; Internal jugular vein thrombosis; Septic emboli; *Fusobacterium necrophorum*; Oropharyngeal infection; Septic thrombophlebitis

### I. Introduction

Lemierre’s syndrome is a rare, life-threatening complication of an acute oropharyngeal infection. It is generally characterized by pharyngitis secondary to *Fusobacterium necrophorum* Figure(a)<sup>(1)</sup>, an anaerobic Gram-negative bacillus normally present in the oropharyngeal flora causing thrombophlebitis of the internal jugular vein and sepsis, with subsequent formation of septic emboli that can rapidly spread to different organ sites<sup>(2)</sup>, most commonly affecting the lungs.<sup>(3)</sup>

Timely diagnosis and antibiotic treatment are essential to prevent adverse outcomes. Clinical circumstances dictate the necessity for therapeutic anticoagulation and surgical intervention. Lemierre’s Syndrome can present atypically in terms of the antecedent condition, the etiological agent, the affected vein, and the distant manifestations. Despite the existence of a characteristic clinical presentation, many clinicians remain unaware of this rare condition, which can lead to delayed diagnosis and potentially fatal consequences.<sup>(3)</sup>

### II. Case Presentation

A 24-year-old male presented to the

emergency department with complaints of high-grade fever, severe throat pain, difficulty swallowing, right-sided neck swelling, and shortness of breath for five days. He had a history of untreated sore throat and fever one week prior to admission and had self-medicated with over-the-counter Paracetamol without taking any antibiotics. The patient had no known comorbidities, previous hospitalization, or chronic illness or immunosuppressive therapy.

On admission, the patient was febrile and appeared acutely ill. His vital parameters were as follows:

Parameter	Finding
Temperature	103°F
Blood pressure	104/68 mmHg
Pulse rate	118 beats/min
Respiratory rate	28 breaths/min
Oxygen saturation	90% on room air

Physical examination revealed inflamed tonsils with pharyngeal congestion. A tender swelling was present on the right side of the neck, associated with restricted and painful neck movements. Chest auscultation revealed bilateral coarse crackles, suggesting respiratory involvement.

### III. Timeline of Clinical Events

Timeline	Clinical event
Day 0	Patient presented to the emergency department with fever, neck swelling, dysphagia, and breathlessness.
Day 0-1	Laboratory investigations and radiological imaging were performed.
Day 1	CECT neck showed right internal jugular vein thrombosis; CT chest showed bilateral septic pulmonary emboli.
Day 5	Symptoms progressed with difficulty swallowing and right-sided neck swelling.
Day 7	Patient developed sore throat and fever.
During hospitalization	Intravenous antibiotics, anticoagulation, oxygen support, intravenous fluids, and supportive care were initiated.
Discharge	Patient was discharged on oral antibiotics and oral anticoagulant therapy with advice for follow-up and repeat imaging.

#### Diagnostic Assessment

Laboratory investigations demonstrated leukocytosis with markedly elevated inflammatory markers, supporting the presence of severe bacterial infection and systemic inflammatory response.

#### Microbiological Investigation

Microbiological investigations revealed growth of *Fusobacterium necrophorum* in the blood culture, confirming the presence of anaerobic bacteremia commonly associated with Lemierre's syndrome. Throat swab culture showed mixed oral flora without any significant pathogenic isolate. Correlating the patient's clinical presentation with radiological evidence of internal jugular vein thrombosis, septic pulmonary emboli, and microbiological findings, a final diagnosis of Lemierre's Syndrome was established.

**Table1. Laboratory Investigations**

Investigation	Result	Interpretation
Hemoglobin	12.4g/dL	Within acceptable range/mild anemia if reference-dependent
Total WB Ccount	21,800cells/mm <sup>3</sup>	Leukocytosis
Platelet count	2.10lakh/mm <sup>3</sup>	Within normal range
C-reactive protein	148 mg/L	Markedly elevated
ESR	66 mm/hr	Elevated
Serum creatinine	0.9mg/dL	Normal renal function
Blood urea	24 mg/dL	Within normal range
Procalcitonin	11.2ng/mL	Suggestive of bacterial sepsis

**Clinical Images.**

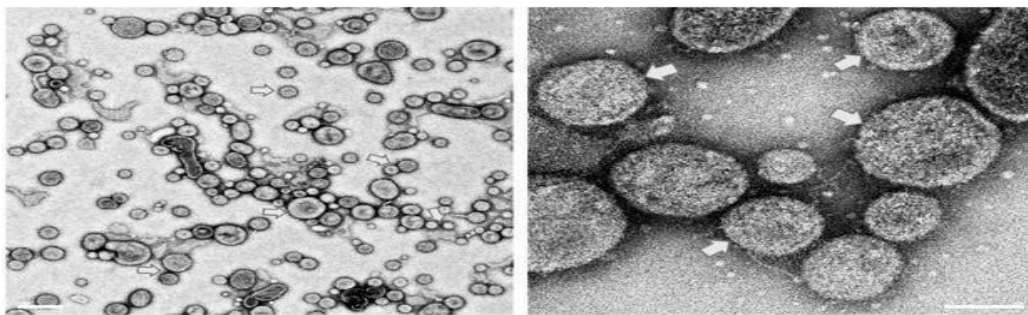


Figure1. Representative image of *Fusobacterium necrophorum*, an anaerobic Gram-negative organism commonly associated with Lemierre's syndrome. <sup>(1)</sup>

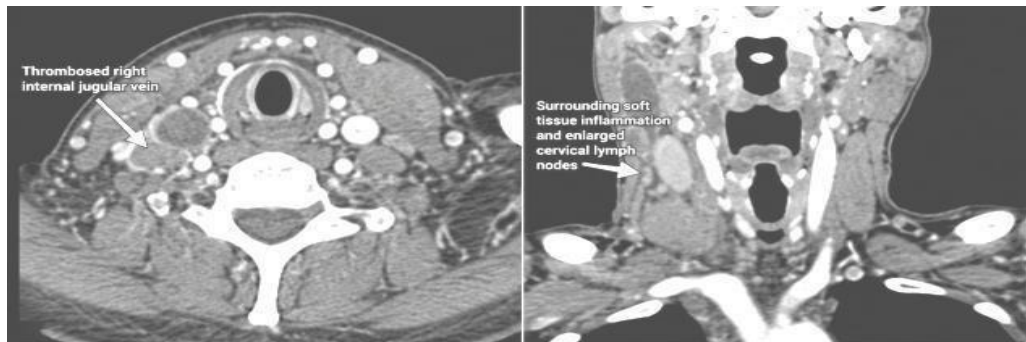


Figure2. Contrast-enhanced CT neck showing thrombosis of the right internal jugular vein with surrounding soft tissue inflammation.



Figure3. CT chest and chest radio graph showing bilateral nodular infiltrates with cavitory lesions suggestive of septic pulmonary emboli.

#### IV. Therapeutic Intervention

The patient was admitted to the intensive care unit and treated with broad-spectrum intravenous antimicrobial therapy, anticoagulation, oxygen support, and supportive care.

##### In-Hospital Management

Treatment	Dose/Frequency	Purpose
Intravenous fluids	As required	Hemodynamic support
Piperacillin–tazobactam	4.5gIVTDS	Broad-spectrum antibacterial coverage
Metronidazole	500mgIVTDS	Anaerobic coverage
Pantoprazole	40mgIVOD	Gastric protection
Paracetamol	1g IVSOS	Fever and pain management
Enoxaparin	60mgSCBD	Anticoagulation for internal jugular vein thrombosis
Oxygen support	As required	Correction of hypoxia
Nutritional and supportive care	As required	General recovery and supportive management

Daily monitoring of complete blood count, inflammatory markers-renal function, oxygen saturation, and clinical symptoms was performed.

##### Discharge Medication and Follow-up Advice

After clinical improvement, the patient was discharged with oral antimicrobial therapy and anticoagulation.

Medication	Dose/Frequency	Duration
Amoxicillin–clavulanic acid	625mgTDS	10 days
Metronidazole	400mgTDS	7 days
Pantoprazole	40mgOD	As advised
Paracetamol	650mgSOS	As required
Apixaban	5mgtwice daily	6 weeks

#### V. Discussion

Lemierre's syndrome is a severe human infection usually caused by *Fusobacterium necrophorum* subsp. *funduliforme*. It usually begins with an untreated or inadequately treated oropharyngeal infection, followed by thrombophlebitis of the internal jugular vein and hematogenous spread of septic emboli, most commonly to the lungs. The syndrome is typically characterized by recent throat infection, persistent fever, neck swelling, respiratory involvement. Moreover, radiological evidence of internal jugular vein thrombosis. Isolation of *Fusobacterium necrophorum* from blood culture further supports the diagnosis.<sup>(4)(5)</sup>

However, the complications of this rare but

severe disease includes osteomyelitis, meningitis, and acute respiratory distress syndrome. The treatment is efficacious and follows the general principles: systemic antibiotics, drainage of abscesses, and perhaps, anticoagulation. Antibiotic treatment is crucial and should provide adequate anaerobic coverage and maybe modified according to microbiological findings and clinical response. The patient is managed using antibiotic therapy, anticoagulation and supportive management.<sup>(6)</sup>

Piperacillin–Tazobactam in combination with Metronidazole was administered, which resulted in gradual clinical improvement with reduction in fever, inflammatory markers, and respiratory symptoms. Anticoagulation with Enoxaparin followed by oral Apixaban was initiated

due to internal jugular vein thrombosis. Continuous monitoring and supportive care played an important role in preventing further septic complications and improving clinical outcome.

## VI. Conclusion

In conclusion, Lemierre's syndrome is a rare but potentially life-threatening complication of an oropharyngeal infection, characterized by internal jugular vein thrombosis and septic embolization. In the present case, early recognition supported by radiological evidence of internal jugular vein thrombosis and clinical suspicion led to timely diagnosis. Prompt initiation of Piperacillin–Tazobactam with Metronidazole, along with anticoagulants, resulted in significant clinical improvement. The patient showed significant improvement in signs and symptoms. This case emphasizes the importance of early diagnosis and combined medical management to achieve a favorable outcome and prevent serious complications.

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