

Lemierre's Syndrome. Relevance of Ultrasound in Early Diagnosis

Julia Tejerina Puig, Manuel Jorge Marco Escoto*, Fernando Asensio Payá and José María Carrasco Barea

Intensive Care Unit, Hospital Marina Baixa, Villajoyosa, Alicante, Spain

*Corresponding Author: Manuel Jorge Marco Escoto, Intensive Care Unit, Hospital Marina Baixa, Villajoyosa, Alicante, Spain.

Received: December 29, 2022; Published: February 16, 2023

Abstract

Lemierre's syndrome is a rare but serious disease today. It is characterized by septic thrombophlebitis of the internal jugular vein after an oropharyngeal infection, which can cause metastatic infections due to septic embolisms. Caused by anaerobic bacteria, the most frequently isolated germ is *Fusobacterium necrophorum*. For the diagnosis, in addition to a high clinical suspicion, imaging techniques such as ultrasound or tomography are of great help. The case presented here is of a young patient with Lemierre's Syndrome for whose diagnosis the use of doppler ultrasound was of vital importance.

Keywords: Lemierre's Syndrome; *Fusobacterium*; Septic Embolism; Doppler Ultrasound

Abbreviations

CT: Computerized Tomography; ICU: Intensive Care Unit

Introduction

Lemierre's syndrome is a rare entity, although relevant since it is potentially severe and because it mainly affects young patients.

It is a septic thrombophlebitis of the internal jugular vein that occurs after an acute oropharyngeal infection, and later metastatic infections due to septic emboli, most frequently located in the lungs.

Due to the widespread use of antibiotics and the appearance of new species of resistant bacteria, the incidence of this disease could increase in the near future [4].

Case Presentation

This is a case of an 18-year-old male, with no medical history, who attended the Emergency Department with a 5-day history of fever, general malaise, sore throat, dyspnea, and pleuritic chest pain, despite having received azithromycin 500 mg for 3 days.

Upon arrival, he presented the following vital signs: blood pressure 70/40 mmHg, heart rate 130 bpm, respiratory rate 25 rpm, satO₂ 93% breathing room air. Physical examination revealed pain on cervical palpation, with indurated and painful left cervical lymph nodes.

Analytically, leukocytosis with neutrophilia and elevated acute phase reactants were observed (highlighting a procalcitonin level of 33.04 mg/dL). In addition, there was data of thrombocytopenia, coagulopathy and acute renal failure.

A chest X-ray was taken in which no pathological findings were observed.

Given these data, and after extracting blood cultures, antibiotic therapy with ceftriaxone and levofloxacin was started, and the patient was hospitalized on the ward with a diagnosis of respiratory sepsis.

Despite the treatment, the patient evolved negatively, with persistent fever and rapidly progressing dyspnea, for which he was admitted to the Intensive Care Unit (ICU).

At that time, he presented neck pain, fever, and hypoxemic respiratory failure requiring high-flow oxygen therapy.

Given the symptoms of oropharyngeal infection with subsequent progression to respiratory sepsis, Lemierre's syndrome was suspected, and a cervical doppler ultrasound was performed, which reported a "filling defect at the level of the left internal jugular vein" (Figure 1). Then a cervical and thoracic computed tomography (CT) scan was performed, which revealed "signs of multilobar pneumonia associated with bilateral pleural effusion. Complete occlusion of the left jugular vein" (Figure 2 and 3). Given this clinical picture, ceftriaxone and levofloxacin were suspended and treatment was started with imipenem and metronidazole, together with anticoagulation with low molecular weight heparin. After 24 hours of admission, positive blood cultures for *Fusobacterium necrophorum* were obtained, confirming the diagnosis of Lemierre's Syndrome.

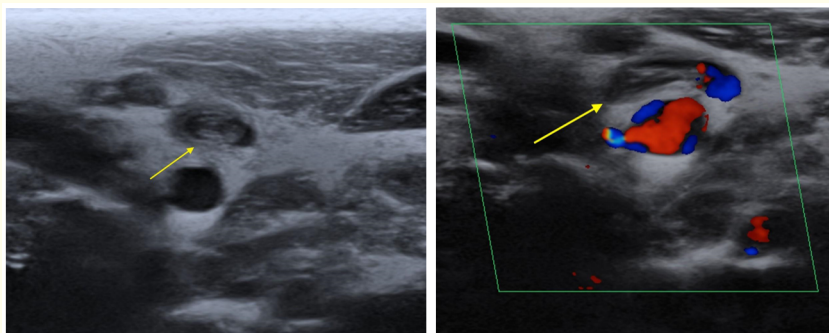


Figure 1: Cervical color ultrasound doppler. Left jugular vein filling defect (arrow).



Figure 2: Cervical CT. occlusion of the left jugular vein (marked with an arrow).

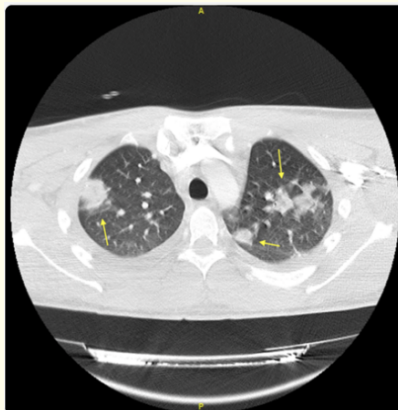


Figure 3: Chest CT. Multiple condensations compatible with septic embolisms (arrows).

Case resolution

When treated with imipenem and metronidazole, the patient presented progressive clinical improvement. High-flow oxygen therapy could be withdrawn after 5 days, switching to conventional oxygen therapy.

Progressive analytical correction was observed, with resolution of renal failure, thrombocytopenia and coagulopathy.

After 5 days of admission to the ICU and 30 days of hospitalization, the patient was discharged home asymptomatic and without sequelae.

Discussion

Lemierre's syndrome is considered a rare disease today, although it was an entity of great importance, with high morbidity and mortality, in the pre-antibiotic era [1].

It is mainly caused by *Fusobacterium necrophorum*, a Gram-negative, non-spore-forming, strict anaerobic germ that is usually found in the oral flora, intestinal and/or genital tract. Cases of group B and C streptococcal infection have also been described, oral *streptococci*, *enterococci*, *Proteus* and *Candida* [1].

There is a great relationship between the pathogenesis and the symptoms of Lemierre syndrome [3]:

- The first phase is the primary infection, most frequently in the form of acute pharyngitis, although cases have also been described in patients with dental infections and mastoiditis.
- The second stage occurs after invasion of the pharyngeal space, usually via the lymphatics, although it could also occur by direct or perivascular extension. In this stage, thrombophlebitis of the internal jugular vein would occur, the most characteristic clinical moment.
- The third stage would be metastatic infection, produced by bacteremia and hematogenous dissemination. The most frequent septic embolization is pulmonary, although it can be found in different locations.

Diagnosis may be difficult and late given the rarity of the disease today. The symptoms would be acute pharyngitis associated with painful inflammation in the cervical region and induration in the mandibular angle, and in the sternocleidomastoid territory. The confirmatory diagnosis would be positive blood cultures for *Fusobacterium necrophorum*, although antibiotic therapy must not be delayed until they are positive. CT is considered the most sensitive imaging test, since it would detect jugular vein thrombosis and metastatic disease. Doppler ultrasound is a good alternative because it is a fast, low cost and non-invasive bedside test very sensitive for venous thrombosis. Therefore, in light of high clinical suspicion, a doppler ultrasound could be performed to confirm the existence of thrombosis in the jugular venous territory. Another useful imaging test could be a chest X-ray, in which bilateral consolidations might be observed in the case of pneumonia or septic emboli. In the case of allergy to iodinated contrasts or a contraindication for irradiation, magnetic resonance imaging could be used [2].

Treatment is based on supportive measures and systemic antibiotic therapy at high doses for a long period of time (3 - 6 weeks). Early empirical antibiotic therapy should be instituted without microbiological confirmation, since a delay in the start of treatment increases mortality. In general conditions, *Fusobacterium* is sensitive to penicillin. In most of the articles reviewed, the authors recommend the use of high-dose intravenous penicillin and metronidazole or monotherapy treatment with clindamycin in allergic patients [3].

Anticoagulation has also been proposed as an antithrombotic measure, although it is currently considered a controversial treatment by several authors. Anticoagulation therapy is currently limited to patients with retrograde extension of the thrombus towards the cavernous sinus [3].

In the case presented, Doppler ultrasound was key to the diagnosis. This is a fast, simple, safe and bedside technique that can confirm the characteristic thrombophlebitis of the internal jugular vein in Lemierre's Syndrome and thus facilitate the initiation of adequate antibiotic therapy.

Conclusion

Here a case of Lemierre's Syndrome is presented with typical clinical features, in which oropharyngeal infection progressed to respiratory sepsis. In this case, doppler ultrasound played a key role in early diagnosis, allowing rapid initiation of adequate antibiotics. We believe that this article brings valuable and useful data for clinicians facing this disease.

Conflict of Interest

The authors have not received any financial benefit from making this article.

Bibliography

1. Pulcini C., et al. "[Lemierre's Syndrome: A Report of Six Cases]". *La Revue De Medecine Interne* (2003).
2. Gudinchet F., et al. "Lemierre's Syndrome in Children: High-Resolution CT and Color Doppler Sonography Patterns". *Chest* (1997).
3. Tellería Martín A., et al. "Síndrome De Lemierre". *Medicina Intensiva* (2005).
4. Montiel Crespo R., et al. "Síndrome De Lemierre. La Enfermedad Olvidada". *Medicina Intensiva* 29.8 (2005): 437-440.

Volume 7 Issue 2 February 2023

©All rights reserved by Manuel Jorge Marco Escoto., et al.