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Case Report

Empyema associated with Lemierre syndrome: case report and literature review

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ABSTRACT

Postanginal septicemia, also called Lemierre syndrome, is a metastatic infection that can have multiple complications, including empyema. Therefore, the natural history of the disease begins with an infection of the oropharynx by microbiota from the digestive system, which causes a thrombophlebitis of the jugular vein with septic infiltrations, including into the lungs causing pneumonia, which in turn can generate parapneumonic effusions and/or empyemas. Furthermore, it is a syndrome that was thought to have been forgotten by the era of antibiotics, but with resistance to these antibiotics it has begun to re-emerge. Next, we will talk about a case of a 41-year-old man with no significant pathological history, who entered secondary to a peritonsillar abscess which turned into Lemierre syndrome with a treatment based on broad-spectrum antibiotics and then performed of lung decortication by thoracotomy. Empyema as a complication of Lemierre syndrome is rare and even more so in this post-antibiotic era, so health personnel should have a high clinical suspicion since adequate and timely treatment will help reduce the complications of this disease, as well as like his mortality.

Keywords: Lemierre syndrome, Empyema, Sepsis

INTRODUCTION

The French bacteriologist André Alfred Lemierre in 1936 was the first scientist to describe this syndrome at the Claude Bernard Hospital in Paris, which is characterized by an infection of the oropharynx associated mainly with anaerobic bacteria from the oral flora, including "*Fusobacterium necrophorum*" which can have various anatomical effects and lead to various clinical presentations.[1,2] One of the clinical presentations is that which is associated with pneumonia which can generate empyema, which is the accumulation of pus in the pleural cavity.[3]

Empyema is a rare complication commonly of the anterior chest wall that can reach extrathoracic tissue such as pericardium, mediastinum, esophagus, peritoneum or cause fistulization to the skin (necessitatis).[4] Before the era of antibiotics, empyema was a complication of approximately 5% associated with pneumonia, with Streptococcus as the etiological agent pneumoniae in 60 to 70% and *Streptococcus pyogenes* in 10 to 15% as well as *S. aureus* in 5 to 10%. Contrary to the statistics presented above, in most cases it is not possible to isolate a causal microorganism, or the cultures are associated with multiple etiological agents.[5]

With the era of antibiotics, empyema is a rare complication, but with a mortality rate of up to 20%.[5] However, in recent years there has been a great threat, which is antimicrobial resistance, which is the ability of bacteria to survive concentrations of antibiotics.[6] Due to the above, there has been a resurgence of diseases that were rarely seen, such as the case of Lemierre syndrome, therefore one must have a clinical suspicion for its diagnosis as well as knowledge of new treatment therapies.

Due to the above and the diversity of the disease, we present the following case to raise awareness of the severity of empyema associated with Lemierre syndrome.

CASE REPORT

Below, we present a case of a 41-year-old patient, with the following important history: Positive smoking for 28 years with smoking index: 28, positive alcoholism for 28 years, AUDIT scale 16 points, exposure to solvents for 24 years due to his occupation (carpenter). He went to the emergency department with symptoms of odynophagia, right otalgia, fever of 38.6 ºC, as well as asthenia for 4 days. The left peritonsillar abscess was diagnosed by the otorhinolaryngology service, drained and admitted to hospital with treatment based on ketorolac, ampicillin and dexamethasone. On the second day of hospitalization, he began to experience pleuritic pain in the left hemithorax, as well as sudden dyspnea on medium exertion, for which he consulted the internal medicine service. During his evaluation, the patient was found to be tachypneic and febrile. In addition, he had pleuritic-type pain radiating to the neck with adrenergic symptoms such as weakness, palpitations, and sweating.

An electrocardiogram was performed which showed no signs of injury, ischemia or myocardial infarction with the following paraclinical tests: creatine kinase: 22 U/l, creatine kinase MB: 10.90 U/l, lactate dehydrogenase: 275 UI/l, TGO/AST: 12.20 IU/l, ferritin: 1056 ng/ml, procalcitonin: 1.38 ng/ml, leukocytes: 14.59×10^3/µl, neutrophils: 12.51×10^3/µl, hemoglobin: 15.5 g/dl, hematocrit 47.3%, platelets 292×10^3/µl, and D-dimer 489.86 ng/ml.

Imaging studies

The imaging studies of the left pleural effusion is given in Figure 1.

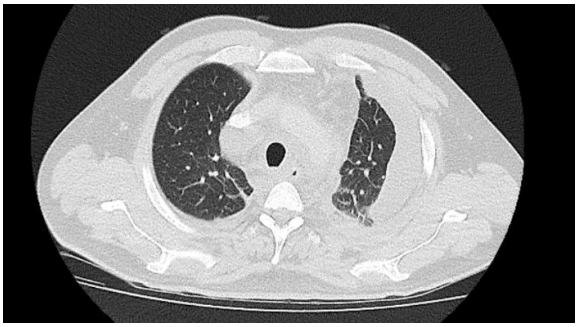

Figure 1: Computed tomography (CT) of the chest: left pleural effusion, as well as atelectasis located in the lower lobe of the left lung, right lung spared.

Due to the above, it was decided to change the regimen to vancomycin and imipenem empirically, as well as anticoagulation with low molecular weight heparins, progressing favorably with a decrease in inflammatory parameters, until 8 days later when he presented decompensation of vital signs, associated with fever and commitment of the general state.

Secondary to this, a computed tomography (CT) scan was performed again with involvement of the left internal and external jugular vein, as well as involvement of the left lung parenchyma (Figure 2).

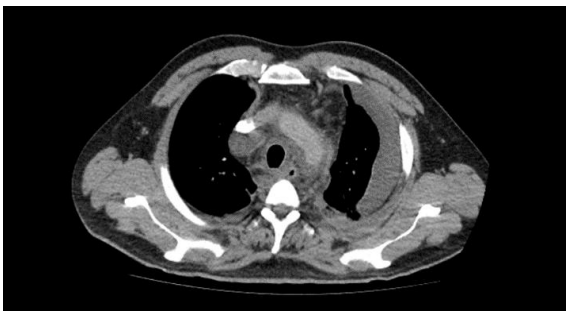

Figure 2: Conglomerates of nodular formations that surround vascular structures of the left internal and external jugular vein, as well as the mediastinum, pericardial effusion, left pleural effusion and a left lung consolidation process, right lung with a focus of right apical pneumonitis. Rest of anatomy without involvement.

Thoracentesis was performed, obtaining 100 cc of purulent secretion with the following pleural cytochemistry. Physical examination yellow, appearance: cloudy, density: 1.015, pH: 6.5, coagulability: positive, leukocytes: 7.485/mm^3 leu/mm^3, erythrocytes 916/mm^3, mononuclear: 43%, polymorphonuclear: 57%, glucose: 1.1 mg/dl, proteins: 4.13 g/dl, and LDH: >13528 u/l. Histological report: Predominance of neutrophilic infiltrate, lymphocytes and erythrocytes in moderate quantity, protein background with few mesothelial cells. Culture and blood culture showed no bacterial development.

DISCUSSION

Given the pericardial effusion, a Doppler echocardiogram was performed, which reported the following findings. There was a pericardial effusion of barely 100 ml. Normal size atria. Left ventricular preserved, global and segmental mobility are normal, LVEF: 63%. There is no diastolic dysfunction. There are no dyskinesia or aneurysmal areas. Due to the above, a consultation was carried out with the thoracic surgery service who decided to perform pulmonary decortication through a left thoracotomy without complications, so broad-spectrum antibiotic treatment was continued and days later it was decided to discharge him due to clinical improvement.

The main complications of Lemierre syndrome are pulmonary, although it is also associated with soft tissue abscesses, pyomyositis, splenic and liver abscesses, osteomyelitis, endocarditis, pericarditis, brain abscess, therefore one should always have a suspicion of other

types of clinical presentations of the syndrome. syndrome for a comprehensive diagnosis.[7]

The diagnosis will be clinical, encompassing a pleuropulmonary syndrome of an effusion type, as well as imaging studies such as simple chest x-ray and/or contrast-enhanced chest tomography. At the same time, thoracentesis for analysis of the pleural fluid is crucial since according to the American Society of Thoracic Surgery in 2017, one of the following diagnostic criteria is sufficient for the diagnosis of empyema: presence of pus, Gram stain, pH less than 7.2, and positive culture.[8] If there is also an association with an oral infection such as abscesses, cavities, gingivitis, etc. With septic metastatic manifestations to other tissues, a Doppler ultrasound of the internal and external jugular vein or a contrast-enhanced tomography of the chest with extension to the neck should be performed since the diagnosis of Lemierre syndrome can be made.[8] The choice of antimicrobial should be guided depending on the clinical history of our patient as well as local patterns of antimicrobial resistance. When considering community-associated empyema, a second or third generation cephalosporin should be started, thinking about non-*S. aureus*. resistant to methicillin as well as a gram- negative infection or a B-lactamase inhibitor such as ampicillin/sulbactam. If an anaerobe is considered, a third-generation cephalosporin or the addition of metronidazole should be used. In the case of in-hospital infections or infections associated with septic shock, broad-spectrum antibiotics should always be considered, as well as coverage for *S. aureus* and pseudomonas such as vancomycin and carbapenems.[8] Perioperative mortality and morbidity, as well as resistance to antimicrobials, is greater when there is pulmonary decortication with thoracotomy, but also patient characteristics such as obesity, chronic heart failure, and arterial hypertension. They will influence the therapeutic outcome.[9]

According to the American College of Chest Physicians (ACCP) and the American Thoracic Society (ATS) surgical treatment is divided into 3 stages according to the radiological, physical and biochemical characteristics as well as the natural course of the disease, therefore stage 1 should be treated with antibiotics and thoracotomy tube, stage II with video-assisted thoracoscopy (VATS) which is superior to fibrinolytic therapy and tube thoracotomy. Stage III, VAST or thoracotomy should be performed.[10] In recent years, VAST surgical decortication has been shown to be superior to open surgery in the treatment of primary empyema in adults since it has fewer postoperative complications, decreased pain, and recovery time. such as lower mortality.[11]

CONCLUSION

Most of the patients arrived in advanced stages of the disease, and as this is consistent with the time of evolution of the condition, more than half of the cases required surgery to resolve the disease. Empyema as a complication of Lemierre syndrome is rare and even more so in this post-antibiotic era, so health personnel should have a high clinical suspicion since adequate and timely treatment will help reduce the complications of this disease, as well as like his mortality.

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