

A complex case of retropharyngeal and mediastinal abscess during the Covid-19 pandemic: Lemierre's syndrome

Ahmet Aksoy¹, Fatih Bingöl¹, Alper Kızıloğlu²

¹ Department of Otorhinolaryngology, Ömer Halisdemir University, Faculty of Medicine, Nigde, Turkey

² Department of Radiology, Ömer Halisdemir University, Faculty of Medicine, Nigde, Turkey

ORCID ID of the author(s)

AA: 0000-0002-7744-8124
FB: 0000-0001-8260-0349
AK: 0000-0002-6921-8716

Abstract

Lemierre's syndrome, which is commonly observed in healthy adolescents and young adults, is characterized by septic thrombophlebitis of the internal jugular vein and is usually observed after an oropharyngeal infection. At the time of the pandemic, as a result of so many patients COVID-19, similar symptoms were initially diagnosed as a possible coronavirus case and followed up with a possible diagnosis of COVID-19 before being consulted. We present the case of a 23-year-old male patient, who was referred to our clinic with complaints of fever, sore throat, dysphagia, shortness of breath, and chest pain. A retropharyngeal and mediastinal abscess occurred after these symptoms were successfully treated with surgical and medical interventions. The patient was initially considered a potential case of COVID-19 and followed as such. COVID-19 was then excluded, and the patient was reported to have an abscess extending from the retropharyngeal area to the mediastinum. We aim to present the diagnosis and treatment of Lemierre's syndrome based on a literature review.

Keywords: Lemierre's syndrome, Internal jugular vein, Retropharyngeal abscess, COVID-19

Corresponding Author

Ahmet Aksoy

Department of Otorhinolaryngology Head and Neck Surgery, Nigde University, Faculty of Medicine, Nigde, 51240, Turkey
E-mail: aksoyahmet@ohu.edu.tr

Informed Consent

The authors stated that the written consent was obtained from the patients presented with images in the study.

Conflict of Interest

No conflict of interest was declared by the authors.

Financial Disclosure

The authors declared that this study has received no financial support.

Previous Presentation

This study was presented in Turkish Thoracic Society 24th Annual National Congress, 17-21 November 2021 Titanic Deluxe Belek / Antalya, Turkey

Published

2022 March 29

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Introduction

In the early 21st century, a new member of the human RNA coronavirus affecting the entire world was identified in Wuhan, China. International committees referred to it as severe acute respiratory syndrome-coronavirus 2 (SARS-CoV-2) [1]. The most common COVID-19 symptoms are fever, cough, fatigue, shortness of breath, myalgia, arthralgia, dysphagia headache, sore throat, and loss of smell and taste [2]. Lemierre's syndrome (LS) is a clinical presentation of human necrobacillosis or postanginal sepsis that develops after an acute anaerobic oropharyngeal infection, which is a rare condition with a potentially fatal course. *Fusobacterium necrophorum*, an obligate anaerobe, non-spore-forming and gram-negative bacillus, can cause severe infections [3, 4]. In its primary stage, this infection is characterized by persistent fever and widespread metastatic abscesses that originate from the head and neck of healthy and young adults (15–30 years old) [5]. In this study, we present the case of LS in a young adult patient with retropharyngeal and mediastinal abscess who initially presented symptoms of sore throat, dysphagia, shortness of breath, chest pain and persistent fever. The diagnosis was made during an early stage of COVID-19 in Turkey. The clinical results included sepsis, septic thrombophlebitis in the internal jugular vein (IJV) and pericardial abscess. Thus, we reviewed the clinical features, treatment, and complications associated with LS.

Case presentation

In April 2020, a dark-skinned 23-year-old male of Asian origin and no specific occupation was admitted to our hospital's pulmonology clinic with complaints of shortness of breath, fever, sore throat, and chest pain. There was poor oral and dental hygiene and a smoking habit. He had no systemic disease. Because of a persistent fever on the first day of his follow-up and suspected COVID-19, a nasopharyngeal and oropharyngeal swab sample was obtained. SARS-CoV-2 was determined by real-time reverse transcriptase polymerase chain reaction (rRT-PCR) and SARS-CoV-2 IgG/IgM antibody tests were conducted.

The patient was provided detailed information about the study and an informed consent form was obtained. PCR and antibody results yielded negative results. Thorax computed tomography (CT) showed ground-glass appearance and focal consolidation zones in both lungs as well as minimal pericardial effusion. Because of a recent history of dental infection, the cardiology department verified the patient for infective endocarditis and excluded it. Despite the piperacillin/tazobactam + moxifloxacin treatment, the fever did not decrease, and there was no bacterial growth in the blood, urine, stool, or sputum cultures; therefore, the treatment was changed with meropenem + ciprofloxacin. During follow-up, the patient developed thrombocytosis (platelet count $>820 \times 10^3/\mu\text{L}$) and no atypical cells were observed in the peripheral smear examination. Brucella serology and sputum acid-fast bacilli smear tested negative.

Because of the accompanying sore throat symptoms, the presence of persistent fever and constant high C-reactive protein, a neck ultrasonography (USG) was performed on the 14th day of the treatment, thus showing echogenic appearances that suggested diffuse air in the posterior proximity of the thyroid gland and a suspicious area of $\sim 7 \times 6$ cm with indistinct borders. Subsequently, contrast-enhanced neck and thorax CT scans were performed, revealing fluid collection and free air density in the retropharyngeal space. The abscess started from the retropharyngeal region and extended from the posterior of the trachea to the thoracic inlet and carina (Figure 1). It was a retropharyngeal abscess consistent with fluid loculation with dense contents extending from the mediastinum, compressing the esophagus from the posterior, with local air foci. There was thrombus in the left IJV and thickening around the vessel, consistent with thrombophlebitis (Figure 2). Fluid loculations with similar dense content and peripheral contrast enhancement were observed in the arcus aorta and anterior areas of the heart. There was pericardial and bilateral pleural effusion measuring 3 cm in its widest part. Consolidations were then observed in the medial segment of the right lung middle lobe and in the left lung inferior lingula (Figure 3).

The patient, referred to us for consultation, was then taken in for an emergency operation simultaneously with chest-cardiovascular surgery. Abscesses in the mediastinum and pericardial regions were drained with median sternotomy. Moreover, there was multiloculated pus in the anterior mediastinum; moreover, abscess and necrotic foci in the upper lobe of the right lung were removed. Granulated necrotic tissues around the pericardium were excised, and specimens were

collected. Bilateral pleural effusion was drained. A total of three tube thoracostomies were applied; one each to the right and left thorax and the mediastinum. Subsequently, neck exploration and tracheotomy surgeries were performed in the neck region. An abscess focus was located in the posterior part of the trachea, medial to the carotid; it was highly purulent and a penrose drain was placed in the surgical area. There was no growth in abscess cultures obtained from either the mediastinum or neck during surgery.

Figures 1: In the axial (a) and sagittal (b) sections of the neck, an abscess cavity is seen in the retropharyngeal region, enhanced from the periphery and air densities in the superior.

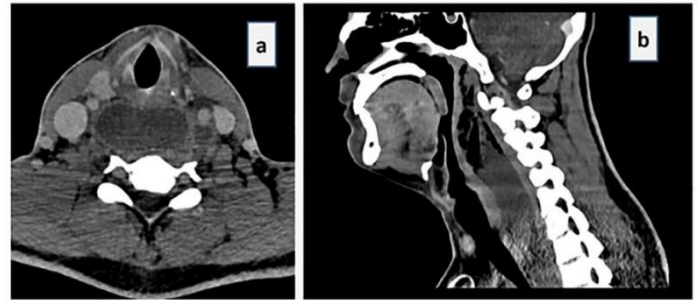


Figure 2: In consecutive axial sections, the left internal jugular vein is not filled with contrast and thickening is seen in the vessel wall (red arrow). Findings are consistent with jugular vein thrombophlebitis.

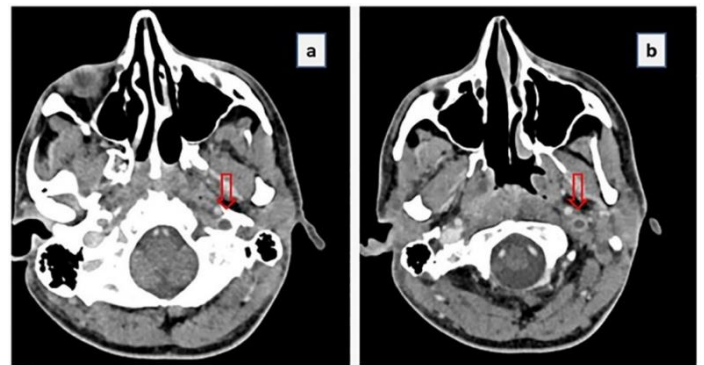
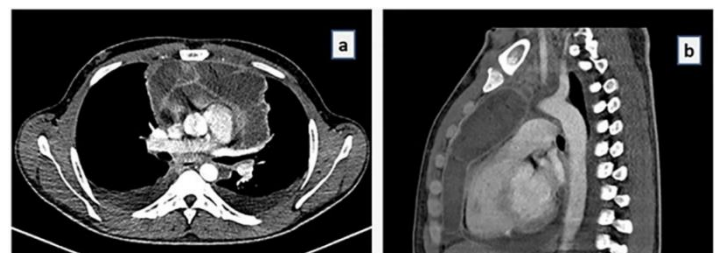
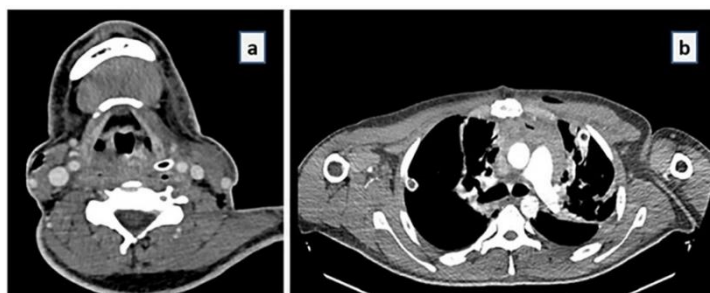


Figure 3: In the thoracic sections in the axial plane (a), a fluid is observed in the prevascular area in the multiloculated character, which is enhanced from the periphery, and pleural fluid is observed in both hemithoraces. In sagittal sections (b), a loculated fluid cavity is observed, which is compatible with an abscess enhancing from its periphery, which extends from the superior mediastinum to the anterior mediastinum.



On the first postoperative day, control contrast-enhanced thorax/neck CT showed that abscesses in both the neck and mediastinum were completely drained (Figure 4). The pathology was reported as chronic active pericarditis and debridement material in the mediastinum as abscess formation. The patient was followed up in the intensive care unit for ten days with meropenem + tigecycline + enoxaparin sodium 6000 anti-Xa IU/0.6 ml treatment, and followed for eight days in patient service. On improvement of the clinical picture, the patient was discharged with oral dual antibiotherapy and anticoagulant treatment with tracheostomy stoma closed. Antibiotherapy was continued for six weeks in total, and no additional problems developed in the four-month follow-up of the patient.

Figure 4: Postoperative changes in axial neck (a) and axial thorax (b) sections and total regression of the mentioned loculated fluid collections.



Discussion

LS, a rare clinical condition, occurs after an oropharyngeal infection in adolescents and young adults between the ages of 10 and 35 and causes potentially fatal complications, such as septic thrombophlebitis in IJV. To prevent this life-threatening situation, action must be taken very quickly [6-7].

The diagnosis of LS includes anamnesis, laboratory tests, blood cultures, and neck CT scan. Although *F. necrophorum* is the most common pathogen isolated in the blood cultures of patients, *Streptococcus*, *Bacteroides*, and *Lactobacillus* species play a role in the LS pathogenesis, which is determined by selective culture analysis. The treatment is initially medical, after which antibiotherapy is provided. Indications for surgical intervention are a failure of medical treatment, as well as abscesses and septic embolisms in the neck and other areas. Surgical options include the drainage of abscesses and IJV ligation and resection [8].

Although some studies oppose anticoagulant therapy, additional studies recommend it to prevent the spread of metastatic embolism and the existing thrombus in the LS clinic [9, 10]. Because our case had initial findings of COVID-19 disease, coinciding with the COVID-19 pandemic, this patient was followed up with a pre-diagnosis of COVID-19 in the clinic. However, because the clinical situation of the patient did not improve, despite the broad spectrum of antibiotherapy treatment, imaging techniques were used on the neck 14 days later, thus revealing deep neck infection and mediastinal abscess. The antibiotherapy treatment given at the beginning of the treatment did not provide a complete cure. Although it seemed to slow down the patient's clinical course, it did cause thrombophlebitis in the left IJV and an abscess extending to the mediastinum and pericardium in terms of radiological results.

The reason for the absence of any pathogen growth in the blood cultures of this case and from the abscess samples obtained during surgery could be attributed to the lack of selective culture media for *F. necrophorum* in our laboratory. However, the onset of complaints after dental infection in the anamnesis of the patient, the development of neck and mediastinal abscesses in the follow-up, and the presence of a thrombus in the left IJV suggest the prevalence of LS.

Conclusions

- Despite delayed diagnosis due to COVID-19-like symptomatology and potentially fatal complications secondary to infection, timely acute interventions have saved lives.

- If clinical improvement is not observed despite medical treatment, the initial diagnoses should be reviewed.

- We recommend advanced imaging (USG, CT) for a definitive diagnosis without delay in patients with complaints, such as fever, sore throat, and dysphagia, when no obvious findings are seen in ear, nose, and throat examinations and no improvements are observed despite empirical treatments.

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