



Case report

A case of Lemierre's syndrome with septic shock and complicated parapneumonic effusions requiring intrapleural fibrinolysis



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ABSTRACT

Lemierre's syndrome is a septic thrombophlebitis of the internal jugular vein, which can lead to severe systemic illness. We report a case of an otherwise healthy 26-year-old man who suffered from pharyngitis followed by septic shock requiring intubation and vasopressor support from *Fusobacterium necrophorum* bacteremia. The septic emboli to his lungs caused complicated bilateral parapneumonic effusions, which recurred after initial drainage. He required bilateral chest tubes and intrapleural tPA to successfully drain his effusions. His fever curve and overall condition improved with the resolution of his effusions and after a 33-day hospitalization, he recovered without significant disability. The severity of his illness and difficult to manage complicated parapneumonic effusions were the unique facets of this case. Using an evidence-based approach of tPA and DNase for complicated parapneumonic effusions in Lemierre's syndrome can be safe and effective.

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1. Introduction

Lemierre's syndrome describes a septic thrombophlebitis of the internal jugular vein in the setting of an oropharyngeal infection [1]. This syndrome was originally described by André Lemierre as "anaerobic postanginal septicaemias" occurring in young healthy adults [2] and has been increasingly reported in the medical literature over this past decade [3]. The thrombophlebitis of the internal jugular vein can spread septic emboli to the lung, liver, bones, joints and soft tissues with resultant fever and complications specific to the organs involved [4]. The inclusion of positive blood cultures or ultrasonographic evidence of clot as part of the definition varies [1]. The organism commonly associated with Lemierre's syndrome is *Fusobacterium necrophorum*, an anaerobic gram-negative bacterium commonly isolated in the oropharynx and upper respiratory tract [5].

The authors present a case of Lemierre's syndrome with special attention to the management of recurrent complicated parapneumonic effusions.

Abbreviations: DNase, deoxyribonuclease; ED, Emergency Department; MIST, Multicenter Intrapleural Sepsis Trial; tPA, tissue plasminogen activator; VATS, video-assisted thoracoscopic surgery.

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2. Case report

Our patient is a previously healthy 26-year-old male with a history of tobacco dependence who presented to a local Emergency Department (ED) with fevers, chills, myalgias and sore throat. He was discharged with a presumed viral URI in the setting of a negative rapid strep test. Two weeks later he presented to the ED with a dry cough, pleuritic chest pain and non-specific upper abdominal pain. He had decreased breath sounds and dullness to percussion in bilateral lung bases with no abnormalities on cardiac exam. His peripheral oxygen saturation on room air was above 90% and blood work revealed leukocytosis ($12.6 \times 10^3/\mu\text{L}$ with 7% bands), a hematocrit of 43.9%, and severe thrombocytopenia (platelet count of $7000 \times 1000/\mu\text{L}$). Also notable were renal insufficiency with a BUN 55 mg/dl and Cr 1.8 mg/dl, a venous lactate of 4.3 mmol/l and an arterial blood gas on room air of pH 7.45, PCO₂ 33.9 mmHg and PO₂ 62.3 mmHg. His chest CT showed bilateral pleural effusions and scattered septic emboli (Fig. 1).

He rapidly developed septic shock requiring vasopressors and intubation. He was transferred to our institution, initially for consideration for plasmapheresis due to concern for idiopathic thrombocytopenic purpura. However, on arrival, Lemierre's syndrome was suspected, prompting empiric treatment with Metronidazole and Ampicillin-sulbactam without anticoagulation due to thrombocytopenia. Blood cultures from the transferring hospital later grew *F. necrophorum*. A CT scan of his neck revealed a mild filling

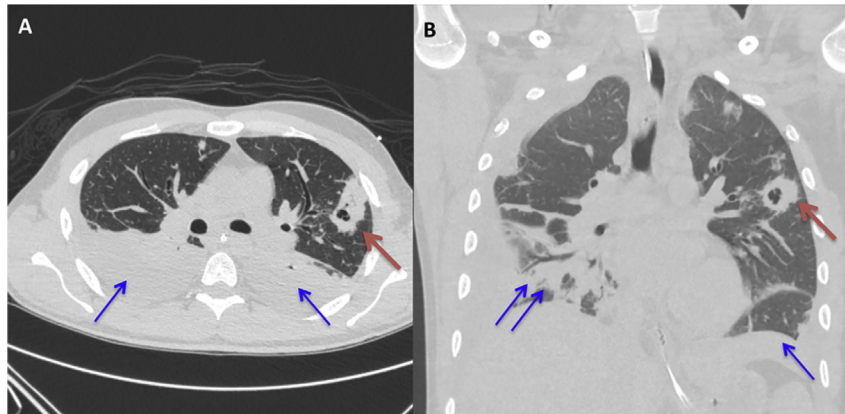


Fig. 1. A. Axial view of a chest CT on admission showing a cavitary lesion in the left upper lobe (thick red arrow) and bilateral pleural effusions (thin blue arrows). B. Coronal view of a chest CT showing similar findings as the axial images of a cavitary left upper lobe lesion (thick red arrow) with focus on right sided consolidation (double thin blue arrows) and smaller left sided effusion (Single thin blue arrow). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

defect of the right internal jugular vein. Despite blood culture clearance, he had ongoing fevers and leukocytosis in the setting of recurrent bilateral complicated parapneumonic effusions (pH of 7.0 and LDH of over 5000U/L bilaterally), prompting placement of bilateral chest tubes. In consultation with the thoracic surgery service, intra-thoracic tissue plasminogen activator (tPA) was administered (alteplase 12.5 mg twice daily) for 3 days to successfully drain each effusion (Fig. 2). Video-assisted thoracoscopic surgery (VATS) was not required. After seventeen days, he was extubated, his fevers abated and platelet count slowly recovered. After a 33-day hospitalization, he was discharged on a course of Amoxicillin-clavulanate for a total course of 5 weeks after definitive drainage with outpatient follow up in another state.

3. Discussion

This case was unique due to the severity of his illness and the use of tPA for bilateral complicated parapneumonic effusions. He required vasopressors for septic shock in addition to intubation for acute respiratory distress syndrome (under 10% of cases reported) [1]. The presence of pleural involvement with septic emboli is common with an incidence up to 92%, with empyemas present in 17–27% of Lemierre's syndrome cases [1,5].

Multiple studies in adults described chest tube placement for

Lemierre's (with culture positive *Fusobacterium necrophorum*) without tPA administration or VATS [6,7]. Only one study noted use of tPA (streptokinase) with success in avoiding surgery in a complicated parapneumonic effusion [8]. If an empyema is present in Lemierre's syndrome, minimally invasive VATS [9] or even thoracotomy with decortication [10,11] can be required.

Management of complicated parapneumonic effusions is an area of active discussion in the medical literature. The ability of intra-pleural tPA to break down septations and deoxyribonuclease (DNase) to decrease the fluid viscosity is established [12]. However, guidelines addressing tPA-DNase use are debated with proponents of this practice citing improved drainage of the effusions in the MIST II trial [13] and others contending that VATS is an effective option for management of empyema and should supercede drainage with chest tubes or intrapleural fibrinolytics [14].

4. Conclusion

The use of tPA-DNase can be an effective and safe treatment strategy for the complicated parapneumonic effusions in patients with Lemierre's syndrome. Given the severity of illness possible from pulmonary involvement in Lemierre's syndrome, the authors propose that chest tubes and fibrinolytics should be considered when complicated parapneumonic effusions arise.

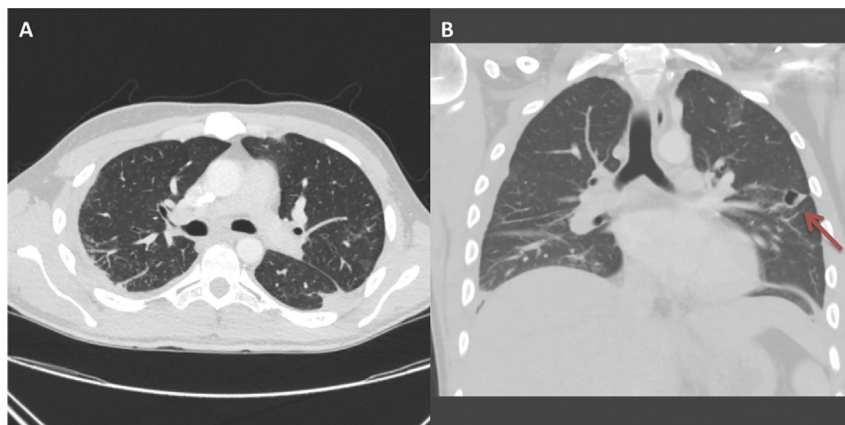


Fig. 2. A. Axial view of a chest CT after removal of chest tubes with evidence of resolving pleural effusions and improving areas of cavitation prior to discharge (thick red arrow). B. Coronal view of a chest CT following chest tube removal showing improvement in bilateral effusions and septic emboli. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Conflict of interest statement

No conflict of interest exists for any author participating in this article.

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