Septic Thrombophlebitis of the Internal Jugular Vein (Lemierre’s Syndrome): A Case Report

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Lemierre’s syndrome, also known as postanginal septicemia, is a rare but serious clinical entity with significant mortality and morbidity. The disease is usually caused by an anaerobic infection of the oropharynx, frequently with septic thrombophlebitis of the internal jugular vein complicated with multiple metastatic infections. Herein, we present a 42-year-old man of Lemierre’s syndrome diagnosed via enhanced computed tomography of the neck and blood culture (Fusobacterium necrophorum). He suffered from acute onset of sore throat, dysphagia and fever with chills for several days. Septic pulmonary embolism was documented by the chest radiograph. Intravenous empiric antibiotics with augmentin® and anticoagulation therapy with enoxaparin plus warfarin were administered. The patient was uneventful one week later and discharged without complications. Lemierre’s syndrome is a rare and life-threatening disease, which usually affects young adults and typically presents as metastatic infection of the lung. Delayed recognition may lead to significant morbidity of metastatic infections and sepsis. Early and adequate administration of intravenous antibiotic therapy is generally associated with a good outcome.

Key words: internal jugular vein, Lemierre’s syndrome, septic thrombophlebitis

Introduction

Lemierre’s syndrome, also known as postanginal septicaemia, is a rare but serious clinical entity with significant mortality and morbidity. The disease is usually caused by an anaerobic infection of the oropharynx, frequently with septic thrombophlebitis of the internal jugular vein complicated with multiple metastatic infections. Herein, we present a 42-year-old man of Lemierre’s syndrome diagnosed via enhanced computed tomography (CT) of the neck and blood culture (Fusobacterium necrophorum). Delayed recognition can lead to significant morbidity of metastatic infections and sepsis.

Generally, early recognition and prompt treatment with antibiotics for anaerobic infections give a favorable outcome.

Case Report

This 42-year-old man was a hepatitis B virus carrier. He suffered from acute onset of sore throat, dysphagia and fever with chills for several days. On arrival of our emergency department (ED), vital signs were body temperature 38.9°C; pulse rate 112 beats/min, respiratory rate 22 breaths/min, and blood pressure 108/70 mmHg. Physical examination revealed enlargement of the right tonsil and...
erythematous change of the oropharyngeal mucosa. There was a tender induration 1.5×1.5 cm in size at right submandibular area. Laboratory data showed white blood cell count (WBCs) 8,900/mm$^3$ with band 5% and segments 55%, hemoglobin 13.5 g/dL, platelet counts 1,32×10$^3$/mm$^3$, C-reactive protein (CRP) 18.4 mg/dL (normal <0.4 mg/dL), sodium 143 mEq/L, potassium 3.6 mEq/L, calcium 9.0 mg/dL, blood urea nitrogen 9 mg/dL, creatinine 0.9 mg/dL, total bilirubin 0.3 mg/dL, aspartate aminotransferase 76 U/L, alanine aminotransferase 88 U/L, alkaline phosphatase 110 U/L, blood sugar 120 mg/dL, prothrombin time 14.1 sec (control 12.0 sec), and activated partial prothrombin time 38.3 sec (control 30.0 sec). Enhanced neck CT (Figure 1) revealed an infiltrative contrast enhancement between right oropharynx and paralaryngeal space, swelling of the palatine tonsil and a low density in right facial vein at the submandibular level, which was compared with venous thrombus. Tonsillitis with infectious process of adjacent soft tissue and complicated with venous thrombus was impressed. In addition, chest radiograph (Figure 2A) showed a small patch lesion in the left lower lung field. Intravenous empiric agent with augmentin® was administered under the suspicion of deep neck infection and septic pulmonary embolism. After intravenous antibiotic for 5 days, the painful swelling over the right submandibular area and fever subsided gradually. Gram-negative bacillus was isolated for 2 sets of blood culture that was identified as *Fusobacterium necrophorum*. The antibiotic sensitivity test showed sensitive to ampicillin/sulbactam. In addition, subcutaneous enoxaparin 60 mg q12h was given for 3 days and then oral warfarin 5 mg per day was given. One week later, the patient was uneventful and discharged under a stable condition without obvious complications. The chest radiography (Figure 2B) showed disappearance of the patch lesion in the left lower lung field in the following. Another 3-week oral amoxicillin/clavulanate was prescribed for complete course of treatment.

**Discussion**

Lemierre’s syndrome is named by Andre Lemierre, a professor of bacteriology at the Claude Bernard Hospital in Paris, after his review of 20
cases were published in the Lancet in 1936. Before the era of antibiotics, prognosis for the disease was extremely poor and only 2 of Lemierre’s 20 patients survived. The disease is an acute oropharyngeal infection with suppuration of the lateral pharyngeal space, bacteremia and septic thrombophlebitis of the internal jugular vein, which causes septic embolism with metastatic infection (1). A primary dental infection and infectious mononucleosis can occasionally give rise to this entity (2). Although rare, it occurred mainly in previously healthy teenagers and adults with a slight male predominance, as has been reported in several retrospective studies (2-4). The incidence of this disease was less than 1 per million per year in a Danish study (3). There is extension of the infection from the oropharynx to the parapharyngeal (or lateral pharyngeal) space. The anterior part of this space consists of the anterior neck muscles and the posterior section contains the carotid sheath, which encloses the internal jugular vein, internal carotid artery, the vagal nerve and lymph nodes. Bacteremia is often continuous in this entity as with other endovascular infections. Diagnosis usually relies on clinical suspicion before the result of cultures is available. Laboratory findings usually include leukocytosis with a left shift, elevated CRP, and subclinical hyperbilirubinemia with mild to moderate elevation of hepatic enzymes (2). Leukocytosis is a common but nonspecific finding in suppurrative thrombophlebitis. The laboratory data of this patient revealed no leukocytosis (WBC 8,900/mm$^3$ with segments 55%), but band form (5%) and elevated CRP (18.4mg/dl) were noted. While pain, tenderness, swelling or induration over the angle of the jaw or along the sternocleidomastoid muscle may be observed. In one report of two contemporary cases with a review of the literature over the past twenty years, a swollen or tender neck in a patient with recent pharyngitis was found in 52 percent of patients (4).

When a patient initially presents to clinicians, the appearance of the pharynx can vary from mild tonsillar injection to a severe exudative tonsillitis or peritonsillar abscess formation. The infection may spread through the lateral pharyngeal space and involve the carotid sheath space, and usually leads to neck pain and sometimes stiffness. Right exudative tonsillitis and erythematous change of the
oropharyngeal mucosa were detected in our patient. The infection is followed by development of septic thrombophlebitis of the internal jugular vein and distant emboli within a week. Internal jugular vein thrombosis has been detected in 26-45% of cases. Involvement of the external jugular vein has also been reported, but with less frequency. Metastatic infections as a consequence of continuous bacteremia mostly occur in the lungs, with a reported frequency of 79-100%. Chest radiograph often demonstrates bilateral, multiple nodular infiltrates associated with pleural effusion. This patient had a septic pulmonary emboli over left lower lung field which disappeared after intravenous antibiotic therapy. Compared to the Lemierre period, deterioration to cavitary pneumonia and empyema is less common due to earlier administration of antibiotics. Less than 10% of cases have been reported to need mechanical ventilation. Metastatic abscesses also occur at other sites, most commonly giving rise to septic arthritis and osteomyelitis. The microorganism may be isolated not only from the blood but also from metastatic sites of infection such as the pleural cavity or joints. The causative organisms are usually members of the normal oropharyngeal flora. The most common pathogen is the anaerobe *Fusobacterium necrophorum*, a Gram-negative, pleomorphic, obligate anaerobic bacillus. This pathogen has been isolated in healthy individuals as well as those with jugular vein suppurative thrombophlebitis and tonsillitis. Other pathogens include other *Fusobacterium* species (e.g. *F. nucleatum*) and other organisms, such as *Porphyromonas asaccharolytica*, *Streptococci* including *S. pyogenes*, and *Bacteroides*, have all been described. *Fusobacterium* species is a normal inhabitant of the oral cavity. Clinical or subclinical icterus may be due to the cholestatic effect of the lipopolysaccharide endotoxin released by *Fusobacterium necrophorum*. The microorganism responsible for suppurative thrombophlebitis can usually be identified from blood cultures. Persistently positive blood cultures should raise suspicion for diagnosis in patients with intravascular catheters. Aspiration of a thrombosed vein or direct culture of the vein may also yield the organism. In a slightly dated surgical series, positive cultures of the vein were obtained from 83 percent of patients. When accompanied with positive blood cultures, venography or high resolution CT (HRCT) scanning can assist in the diagnosis of suppurative thrombophlebitis. HRCT scanning with contrast is probably the most useful investigation for jugular or vena caval suppurative thrombophlebitis and may demonstrate soft tissue swelling and filling defects or thrombus. There is limited experience with magnetic resonance (MR) imaging, but this has been suggested to be a useful modality. With internal jugular vein involvement, ultrasonography may demonstrate thrombosis and has been used to assess extension of thrombus. A positive Gallium scan in the region of the internal jugular vein has been reported. In addition, neck CT can easily detect parapharyngeal abscess which may require surgical drainage.

Due to the proximity of the internal jugular vein to the internal carotid artery, the endovascular nature of the infection, and the frequency of septic pulmonary emboli, prolonged antibiotic therapy is usually required for this condition. High dose intravenous antibiotics targeting anaerobic microorganisms are generally indicated. Since beta-lactamase production by *F. necrophorum* and treatment failure with penicillin has been reported, a beta-lactamase resistant beta-lactam antibiotic is recommended. According to the findings from a susceptibility testing review on anaerobic lung abscess, anaerobic pathogen resistance to penicillin in Taiwan has increased as much as 15%, compared with less than 5% resistance to metronidazole. Therefore, we recommend the use of beta-lactam/beta-lactamase inhibitors as first choice of treatment for Lemierre’s syndrome. The recommended
duration of antibiotic treatment is 2 to 6 weeks. A prolonged course of therapy may be needed for a thrombus with fibrin clot formation of the jugular vein to obtain eradication of *F. necrophorum* within the clot. Ligation and removal of the thrombosed jugular vein should be reserved for uncontrolled infection or acute respiratory failure due to repeated pulmonary embolism, despite adequate antibiotic therapy\(^{(2,5,11,16)}\). Surgical exploration, with ligation or excision of the internal jugular vein is occasionally required\(^2\). Surgical drainage of pulmonary abscesses or empyema may be necessary\(^5\). The role of anticoagulation in this infection remains controversial, and there have been randomized controlled studies to assist in the decision. Some authors would consider its use only if there is an evidence of extension of the thrombus\(^5\). This patient was given enoxaparin for three days before being given warfarin. With intravenous antibiotics plus anticoagulant therapy, the painful swelling over right submandibular area got improved gradually. In the pre-antibiotic era, Lemierre’s syndrome had a rapidly progressive course and an extremely high mortality rate, up to 90%\(^1\). With appropriate antibiotic treatment, the prognosis has improved, but the disease can still be fatal. The reported mortality rate ranges from 0 to 18%\(^{1,2,3}\). Lemierre’s syndrome should be actively considered in any patient with septic pulmonary emboli and persistent fever despite antimicrobial therapy.

## Conclusion

Lemierre’s syndrome comprises internal jugular vein thrombosis following oropharyngeal sepsis and is a rare and life threatening disease. This disease usually affects young adults and typically presents as metastatic infections of the lung. Patients initially suffer from fever, sore throat and complain of tenderness or swelling on the affected side of the neck. Thrombosis is easily demonstrated by Doppler ultrasonography and CT of the neck. The mainstay of treatment is intravenous antibiotics directed at anaerobic microbes. Anticoagulation therapy may be useful if septic emboli persists despite antibiotic therapy. Delayed recognition may lead to significant morbidity of metastatic infections and sepsis. Lemierre’s syndrome should be actively considered in any patient with septic pulmonary emboli and persistent fever despite antimicrobial therapy. Early and adequate administration of intravenous antibiotic therapy is generally associated with a good outcome.

## References


敗血性內頸靜脈血栓靜脈炎(Lemierre氏症候群)：
一病例報告

蔡政翰\(^1,2\) 毛彥喬\(^1,2\) 詹毓哲\(^1,2\)
胡松原\(^1,2,3\) 王立敏\(^1,4\)

Lemierre氏症候群是一種急性口咽炎感染合併敗血性內頸靜脈血栓靜脈炎，罕見且具高致病率與致
死性，多與Fusobacterium necrophorum感柒相關，常見多發轉移性脓瘍。我們報告一四十二歲男性，起
初以急性喉痛及發燒表現，其頸部電腦斷層發現的不內頸靜脈炎合併內頸靜脈血栓，另外胸部影像發現局
部肺浸潤。經過抗生素與抗凝血劑投與一週之後，此病人已被成功治療後出院。此疾病常見於年輕人且
初期臨床表現酷似急性上呼吸道感染，容易被醫護人員疏忽而延遲治療，在此提出一病例報告以提醒急
診醫師早期給予適當治療。

關鍵詞：內頸靜脈，Lemierre氏症候群，敗血性血栓靜脈炎