Chung Shan Medical Journal 2012; 23: 21-26

Case Report

Incomplete Lemierre syndrome: Case report of a 4-year-old boy

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Lemierre syndrome (LS) is now relatively rare, and clinicians and radiologists in current practice may be unfamiliar with it. It presents as acute bacterial pharyngitis or oropharyngeal infections that spread to the deep cervical tissues and eventually result in internal jugular thrombophlebitis and septic embolization. Fusobacterium necrophorum is the most common etiological agent. Since the advent of antimicrobial therapy, its classical characteristics have changed to incomplete forms. Today, blood culture or computed tomography may be the first diagnostic clue, not clinical observation. The use of β-lactamase–resistant antibiotic formulations for 3 to 6 weeks and the drainage of abscesses have been advocated. In general, the prognosis for full recovery is good in patients given prompt and appropriate therapy.

Although most LS patients are healthy adolescents and young adults, we present one 4-year-old pediatric patient with incomplete Lemierre syndrome and provide a review of current literature.

Key words: Lemierre syndrome, jugular vein thrombosis, septic emboli

Introduction

Acute bacterial pharyngitis and oropharyngeal infections typically follow a benign course requiring no treatment or only outpatient antibiotic therapy. Occasionally, such infections may progress from a localized area to one that involves the deep cervical tissues, which eventually results in thrombophlebitis and septic embolization of the internal jugular and facial veins with subsequent development of metastatic emboli to the respiratory tract and ultimately the remaining end points of circulation[1]. This critical situation is known as Lemierre syndrome.

Due to the advent of antibiotics, Lemierre syndrome is now relatively rare, though it may cause significant morbidity and potential fatality if not recognized and treated promptly. Because the disease is rare, physicians or pediatricians may not consider it at initial patient evaluations[2, 3]. More than 70% of LS patients are healthy adolescents and young adults with a male predominance[4, 5]. In this report, we present a case of a 4-year-old male with incomplete Lemierre syndrome and review current literature.

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Case Report

A 4-year-old male was admitted to our pediatric ward for evaluation of a right-sided cervical mass. According to the family, the patient had developed the mass of about 10 × 10 cm in size over a period of about 7 days. It was accompanied by tenderness and swelling. Local heat and erythema were observed and the patient had fevers as high as 39.5 °C. On physical examination, the child was found to have tonsillar erythema and enlargement, normal tympanic membrane, without skin rash. The boy did not complain of eye discharge or pain of any joints. The initial diagnosis of this patient was acute lymphadenitis with deep cervical infection. On admission, the patient was found to have a white blood cell (WBC) count of 17.8×10^3 cells/μL, hemoglobin level of 10.5 g/dL, hematocrit of 31.1%, platelet count of 230×10^3 cells/μL, and C-reactive protein level of 3.56 mg/dL. Glutamic oxaloacetic transaminase (AST) and alanine aminotransferase (ALT) were within normal range. Immunological survey of serum showed negative VCA-IgM and EA(D) IgG antibodies but positive VCA-IgG and EBNA IgG antibodies, which indicated a previous, but not recent, EBV infection.

Incisional biopsy and drainage were performed; microscopically, soft tissue and skeletal muscle were found to have neutrophil and leukocyte infiltration but no malignant change.

Magnetic resonance imaging (MRI) of the head and neck revealed right-sided cervical lymphadenitis with abscess formation involving the carotid sheath and inferior spread of inflammation. There was also associated thrombophlebitis of the right jugular vein and right sigmoid sinus. Lemierre syndrome was suspected from the imaging study (Fig.1). The nasopharynx, oropharynx, and larynx had normal images, and no intracranial abscesses or leptomeningitis were noted.

The patient was treated empirically with ertapenem for the first 10 days. Surgical debridement was performed one week after admission. Fusobacterium necrophorum was cultured from the abscess contents but blood culture yielded negative growth. Subsequent to the culture results, the antibiotic therapy was modified to ampicillin/sulbactam for a further 18 days.

MRI of the neck was repeated after 28 days treatment. Compared to the previous MRI study, there was significant resolution of the inflammation in the cervical region(Fig. 2). The second MRI showed a focal area of mildly increased residual signal intensity in the right infraparotid region, which was suspected of being mild residual inflammation. The patient was considered to be in stable condition and was discharged for follow-up at the outpatient clinic.

Discussion

Lemierre syndrome (LS) was initially described in 1900 by Courmont and Cade and again in 1918 by Schottmuller[6, 7]. Although Sinave et al. defined the syndrome as(1) thrombophlebitis of the internal jugular vein following (2) primary infection in the

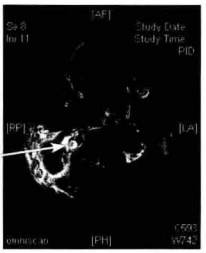

Figure 1. Post gadolinium fat saturated T1-weighted Magnetic resonance (MR) image showing deep neck infection with abscess and involvement of the carotid space resulting in thrombophlebitis of the right jugular vein. (arrow)

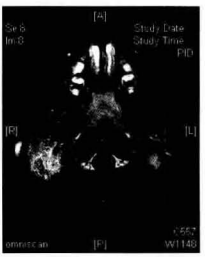

Figure 2. Follow up post gadolinium fat saturated T1-weighted MR image after treatment showing significant improvement with patency of the right internal jugular vein.

oropharynx, (3) septicemia demonstrated by at least one positive blood culture, and (4) presence of metastatic infections[8, 9], several case-reports, such as ours, do not fulfill these four criteria, but were still characterized by internal jugular vein thrombosis following an oropharyngeal infection[10].

The incidence of LS has been reported as 0.6–2.3 per million, with mortality rates of 4–18%[2]. Most patients with LS are healthy and of nonimmunocompromised status. Since the advent of antimicrobial therapy, the incidence of LS has steadily declined and is now uncommon, and more importantly, its classical characteristics have changed to incomplete forms[10].

Fusobacterium necrophorum, a non-motile, pleomorphic, gram-negative strict anaerobic rod, is by far the most common etiological agent to cause Lemierre syndrome[3]. A number of other anaerobic and aerobic organisms have been implicated in LS, including Streptococci, Proteus, Bacteroides, and Peptostreptococcus spp.[4]. Infection with Epstein–Barr virus (infectious mononucleosis) has also been described as a predisposing factor in the development of LS, although its role has not been clearly elucidated[5, 11, 12].

Fusobacterium necrophorum infection usually originates in the palatine tonsils, peritonsillar tissue, and pharynx, but our case presented with swelling of right side neck at the beginning without previous oropharyngeal infection. The pathogen then invades the parapharyngeal tissues, leading to thrombophlebitis of the internal jugular vein (IJV) followed by the characteristic embolization [2-4]. In the next stage, infection spreads directly in the circulatory system or via septic emboli, leading to a series of metastatic complications[3]. Embolic disease to the lungs is most common and is associated with cough, dyspnea, and pleuritic pain [13].

Clinical findings initially depend on the primary site of infection and most are not specific to the syndrome[2, 5]. Half of the patients in one review had a normal physical examination[3]. Some diseases such as infectious mononucleosis or Kawasaki disease also cause lymphadenopathy. Differential diagnosis depends on the clinical presentation. With splenomegaly, generalized lymphadenopathy, Ebpstein-Barr virus infection should be considered. For classic Kawasaki disease, there should be a presence of fever for at least 5 days and at least four of five of the other characteristic clinical features of illness. Fever is generally present in more than 80% of patients[3]. Symptoms of oropharyngeal infection may resolve before progression of the disease[14]. Internal jugular vein thrombophlebitis often manifests as pain and unilateral swelling at the mandibular angle and along the sternocleidomastoid muscle and is occasionally associated with trismus; dysphagia[3]. Usually, the thrombosed IJV itself is not palpable[15].

Today, clinical presentation is often incomplete especially in pediatric patients, a blood culture yielding F. necrophorum may be the first diagnostic clue rather than clinical observation. Furthermore, polymerase chain reaction is more sensitive and rapid than cultures[2].

Recognition of imaging findings consistent with the diagnosis is also crucial to a timely diagnosis nowadays. Contrast-enhanced computed tomography (CT) of the neck is the modality of choice for establishing IJV thrombosis[16] and may identify additional head and neck pathologies[17]. Laboratory values of infection are typical, with elevated C-reactive protein, leukocytosis, mild thrombocytopenia, and elevated transaminase levels commonly identified. The use of magnetic resonance angiography, gallium scans, and radionuclide venography has also been reported [2, 18].

The combination of early diagnosis with aggressive antimicrobial therapy is critical to the effective treatment of Lemierre syndrome. The use of β-lactamase resistant antibiotic formulations has been advocated, and some authors recommend combination therapy with high-dose penicillin and metronidazole or monotherapy with clindamycin [17]. The response of the infection to treatment is usually slow because bacteria are sequestered within a septic thrombus[2]. A typical course of antibiotics ranges from 3 to 6 weeks[2]. The drainage of abscesses is encouraged, but there are differing views on the use of anticoagulant therapy

[13, 19-20]. More aggressive therapy, including internal jugular vein ligation and excision of thrombosed veins is generally reserved for patients with persistent septic embolization after treatment with antibiotics[3, 5]. Overall mortality has decreased since Lemierre's initial series, from 90% to less than 6% [1, 3].

In general, the prognosis for full recovery is good in patients given prompt and appropriate therapy[3]. In conclusion, incomplete Lemierre syndrome may occur in children. Blood culture and imaging such as CT could remind physicians of this diagnosis. A high degree of clinical suspicion of LS should be aroused when a patient with any head and neck infection develops signs of IJV thrombophlebitis, sepsis, or systemic organ failure from septic emboli.

Acknowledgments

The authors would like to acknowledge the contributions of all staff of the Pediatric Emergency Department of the Changhua Christian Hospital.

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Original Article

Incomplete Lemierre syndrome：一個4歲男童的病歷報告

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Lemierre syndrome（LS）是現在比較少見的疾病，以至臨床醫師和放射科醫生可能對其較不熟悉。LS是因為急性咽炎或口咽部細菌感染蔓延至頸部深組織，並最終導致內頸靜脈血栓性靜脈炎或栓塞。壞死梭形菌Fusobacterium necrophorum是最常見的病原體。因為抗生素的使用，使得臨床表現出現incomplete Lemierre syndrome的情形。今日，也許血液細菌培養及電腦斷層掃描的結果而非病患臨床的觀察會是診斷Lemierre syndrome的第一個線索。結合積極的抗生素治療是治療Lemierre syndrome至關重要的方式。治療使用β-lactamase–resistant的抗生素製約 3至6週，並建議做膿腫引流。在一般情況下，給予及時和適當的治療後病患可完全治癒且預後良好。
雖然大多數患者是健康的青少年和年輕成年人，在此個案報告中，我們提出一個 4歲incomplete Lemierre syndrome的兒科病患，並做了一些目前文獻的探討。

關鍵詞：Lemierre syndrome、頸靜脈栓塞、敗血性血栓

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