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CLINICAL RECORD

Lemierre's syndrome – an unusual complication of otitis externa in a young, healthy female

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Abstract

Background: Lemierre's syndrome, which affects previously healthy, young adults, is a rare complication secondary to infections in the head and neck that result in septic thrombophlebitis of the internal jugular vein.

Method: This paper reports a case of a young, healthy female with malignant otitis externa, which resulted in the development of Lemierre's syndrome. A review of the relevant literature was also carried out. This involved a search of the Medline database using multiple search terms including 'Lemierre', 'septic thrombophlebitis', 'otitis externa', 'internal jugular vein thrombosis' and 'management'.

Results: The patient presented with fever, left-sided otalgia, otorrhoea, neck swelling and pain. She was subsequently diagnosed with Lemierre's syndrome and managed accordingly.

Conclusion: Lemierre's syndrome is a potentially fatal complication associated with significant morbidity. A high index of suspicion is required for prompt recognition and the early institution of treatment.

Key words: Lemierre Syndrome; Thrombophlebitis; Otitis Externa; Jugular Vein; Thrombosis; Review; Disease Management

Introduction

Lemierre's syndrome, initially described by Lemierre in 1936, is a rare complication secondary to infections in the head and neck that result in septic thrombophlebitis of the internal jugular vein (IJV).[1–3] Although it was initially described primarily as a complication of pharyngeal infections, several other sources have subsequently been implicated.[2–4]

We present a case of a young, healthy female with malignant otitis externa, which resulted in the development of a disease process consistent with Lemierre's syndrome.

Case report

A 27-year-old female was referred to the otolaryngology clinic from the emergency department with a 1-week history of fever, left-sided otalgia, otorrhoea, neck swelling and pain. She had been diagnosed with otitis externa the day before in the same emergency department and sent home with topical ear drops. Apart from having occasional migraines and gestational diabetes during her previous pregnancy, she denied any other significant past medical or otological history, or any prior surgical operations.

Upon presenting to the clinic, the patient was febrile, diaphoretic, and was unwell and in pain. On examination, she exhibited tenderness on level II of her neck, with decreased range of motion secondary to pain. There was no associated photophobia or rashes. Otoscopic examination revealed an oedematous external auditory canal on her left side with tragal tenderness. Although approximately 50 per cent of the view of her tympanic membrane was occluded by the oedematous canal, it appeared largely normal. There was no tenderness over the left mastoid. The findings of cranial nerve examination were unremarkable. She was haemodynamically stable on presentation.

After being admitted to the ward, the patient was commenced on broad-spectrum intravenous antibiotics (Tazocin®) under the advice of the microbiology team at the hospital. Blood tests revealed mild leucocytosis (leukocyte count of 17.2×10^9/l). Her C-reactive protein was also elevated, at 280 mg/l. The other blood and metabolic test findings were unremarkable.

A computed tomography (CT) scan of the patient's head and neck with intravenous contrast was conducted to further evaluate what was initially thought to be a deep neck space infection. The scan revealed thrombophlebitis of the left IJV, with complete occlusion of the cranial to facial vein confluence, extending into the jugular bulb, and sigmoid and transverse sinuses, and into the torcular herophili. There was also some associated retropharyngeal fluid without marginal enhancement, and reactive left jugular chain lymphadenopathy at levels II and III. The patient was thus anticoagulated with a continuous infusion of intravenous heparin. Magnetic resonance imaging (MRI) further revealed a small amount of oedema in the left lateral cerebellum, which was initially thought to be related to the venous thrombosis.

Clot sampling of the patient's left IJV was performed by the hospital's interventional radiology team shortly after

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her admission. The patient was also taken to the operating theatre during her time in hospital for a cortical mastoidectomy, where large amounts of necrotic material were encountered and debrided, and pus was drained and sent for analysis and culture.

The patient subsequently developed headaches and bilateral VIth cranial nerve palsies. She was reviewed by the ophthalmology team and was found to have bilateral papilloedema. She was thus commenced on intravenous meropenem and vancomycin under the advice of the microbiology team.

A lumbar puncture was performed by the neurology team. The patient was found to have high opening pressures, at 26 mmHg, secondary to the venous outflow obstruction. Drainage of the cerebrospinal fluid resulted in marked improvement in the patient's headache. In addition, along with the administration of acetazolamide and repeated lumbar punctures, her papilloedema improved.

Clinically, the patient gradually improved; she received intravenous antibiotics and anticoagulation throughout her stay. She was discharged 23 days after admission on intravenous antibiotics and subcutaneous enoxaparin for anticoagulation. After a further 14 days of intravenous antibiotics (following discharge), the medication was stepped down to an 8-week course of oral antibiotics (amoxicillin and clavulanate, and ciprofloxacin twice daily) under the advice of the microbiology team.

The findings of the thrombophilia screen, performed during her stay in hospital, were negative. Pathological analysis of the intra-operative specimen revealed necrotic and inflammatory granulation tissue, with fragments of necrotic bone, indicative of osteomyelitis. No micro-organisms were isolated from the multiple blood cultures, ear swabs, cerebrospinal fluid, intra-operative specimens or clot sample. This is probably because of the early administration of antibiotics following clinical recognition of the fact that she was a sick patient.

Discussion

Lemierre's syndrome was initially described primarily as a complication of pharyngeal infections, although several other sources have since been implicated.[2–4] We found only one prior reported case of otitis externa as the presumed source of septic thrombophlebitis of the IJV.[5]

For unknown reasons, Lemierre's syndrome predominantly occurs in previously healthy, young adults at a median age of 22 years.[2] There has been a recent increase in reports of this disease in the literature. It is unclear as to whether this reflects a true increase in incidence. However, possible explanations put forward for an increase in the incidence of the disease include a decrease in the rate of tonsillectomies and a decrease in antibiotic prescription rates for children.[2,4]

The most common organism implicated in Lemierre's syndrome is *Fusobacterium necrophorum*.[1–5] However, several other bacterial species such as bacteroides and eikenella have also been associated with the disease.[2–4] More recently, peptococcus has been implicated in this disease.[5] There has also been recent evidence linking the Epstein–Barr virus to *F necrophorum* infections.[2,3] However, it remains unclear exactly how these bacteria cause septic thrombophlebitis.

The classic progression of the disease usually begins with the primary infection of a site, classically the throat.[2–4] However, rarer sources, including but not limited to otitis, sinusitis and mastoiditis, have also been reported in the literature.[2–4] The infection subsequently invades the surrounding tissue resulting in the development of thrombophlebitis of the IJV.[2–4] This often manifests as neck swelling (23 per cent)[2] or tenderness (20 per cent),[2] as was the case with our patient. Finally, there is metastatic spread of the pathogen to other sites of the body, most commonly the pulmonary system, resulting in pleural effusions, pulmonary abscesses and empyema.[2–4] Interestingly, only 8 per cent of patients initially present with otalgia and/or otorrhoea.[2]

Diagnosis of the condition is usually dependent on a high index of clinical suspicion. During the early stage of the disease, a fever may often be the only clinical finding.[4] Blood cultures can take many days to grow an organism, delaying the commencement of adequate antibiotic therapy. Furthermore, blood cultures can often be negative in Lemierre's syndrome, often because of the early commencement of antibiotic therapy prior to obtaining blood cultures.[2–4] During the later stages of the disease, additional symptoms may manifest themselves. Subsequent radiological imaging of the neck can be used to identify thrombi.[2–4]

Contrast-enhanced neck CT has been described as the optimal mode of imaging for the following reasons: lack of invasiveness, availability compared with MRI, and ability to visualise the IJV and other systemic structures for evidence of disseminated disease.[2–4] Computed tomography can demonstrate low-attenuation intraluminal filling defects, distension of the IJV, and enhancement of the vessel wall and adjacent soft tissue.[3,6] Doppler ultrasonography and MRI have also been used in the diagnosis of the disease.[2–4,6] However, these techniques both have drawbacks: ultrasonography has a lower sensitivity for detecting disease, and MRI often has limited availability and is associated with higher costs.[2–4,6]

- **Lemierre's syndrome is a rare complication, secondary to infections in the head and neck that result in septic thrombophlebitis of the internal jugular vein**
- **There has been a recent increase in reports of this disease; it occurs primarily in previously healthy, young adults**
- **The most common organism implicated is *Fusobacterium necrophorum***
- **Prolonged antibiotic therapy is indicated, and surgical drainage of purulent fluid collections and debridement of necrotic tissue may be required; evidence for anticoagulation is mixed**
- **Lemierre's syndrome poses a diagnostic dilemma because of variability in presenting clinical features**

Treatment of Lemierre's syndrome entails a multidisciplinary approach, involving a collaborative effort between otolaryngologists, microbiologists and radiologists.[2,4] A prolonged course of initially intravenous antibiotic therapy is indicated, usually for three to six weeks.[3] In light of the increase in penicillin resistance in *F necrophorum* cases,[7] beta-lactamase resistant antibiotics with anaerobic activity, such as metronidazole, clindamycin and Tazocin, are recommended.[2,4] Surgical drainage of purulent fluid collections and debridement of necrotic tissue is sometimes required, especially if patients decompensate or fail to improve on

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initial medical therapy.[2,4,8] In our case, we felt surgical drainage of the collection was indicated by the patient's clinical deterioration, which was secondary to raised intracranial pressure and development of a left hemispheric cerebellar abscess. Ligation or resection of the IJV is less commonly practised these days.[2,4] It is only indicated in cases of overwhelming sepsis or repeated septic embolism despite the ongoing use of antibiotics.[3,4,9]

There are a few reports suggesting the benefit of anticoagulation in Lemierre's syndrome patients. However, there is currently no clear consensus on the role and efficacy of anticoagulation in preventing septic embolic events originating from IJV thrombosis.[2,4] In recent reviews, only 21–30 per cent of affected patients were treated with anticoagulation therapy.[2,10] It has, however, been previously recommended in acute settings,[11] or in patients such as ours who have extensive thromboses,[12] and in those with thromboses that display retrograde progression to the cavernous sinus.[13] Our patient underwent heparin anticoagulation and experienced no evidence of secondary septic embolisation. Nevertheless, the role of anticoagulants remains largely controversial in patients with this disease.[2–4] Individualised decisions based on testing and risk factor analysis of patients should be performed when considering the option of anticoagulation.[5]

Conclusion

This paper presents a case of a young, healthy female with malignant otitis externa that resulted in the development of a disease process consistent with Lemierre's syndrome. The treatment of Lemierre's syndrome primarily involves the administration of intravenous antibiotics. Blood cultures are often negative in affected patients; this poses a further dilemma with regard to the ideal choice of antibiotics. Because of the low incidence of Lemierre's syndrome, there have been no randomised, controlled trials comparing treatment regimes. As such, there is no clear consensus on the ideal treatment duration, and the role of anticoagulation remains controversial.

Lemierre's syndrome is a potentially fatal complication associated with significant morbidity. It poses a diagnostic dilemma for clinicians because of the variability of presenting clinical features. A high index of suspicion is required for prompt recognition and the early institution of treatment.

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