Importance of blood cultures to aid the diagnosis of Lemierre’s syndrome
Maryam Nejat, Anja Werno

ABSTRACT
This is a case report of Lemierre’s syndrome, a septic thrombophlebitis of the internal jugular vein (IJV) usually preceded by pharyngitis and bacteraemia with an anaerobic organism. *Fusobacterium necrophorum* is anaerobic Gram-negative bacillus and is the most common organism reported to cause Lemierre’s syndrome which usually occurs one to three weeks post pharyngitis or oropharyngeal surgery. A 21-year-old patient presented with signs of sepsis and a history of sore throat, fever, and tender cervical lymph nodes. Blood cultures grew *F. necrophorum* and Computed Tomography (CT) showed a filling defect in the left retromandibular vein and thrombosis in the left internal jugular vein (IJV) consistent with Lemierre’s syndrome. This is an uncommon condition which normally occurs in young individuals and diagnosis is often delayed.

Introduction
Lemierre’s syndrome was described by Andre Lemierre in 1936 following a published case series of 20 patients with a primary oropharyngeal infection who developed bacteraemia and internal jugular vein (IJV) thrombosis caused by *Fusobacterium necrophorum*, and of whom 18 died. With increasing availability of antimicrobials since the 1940s the incidence of Lemierre’s syndrome has dropped dramatically leading to the eponym of the ‘forgotten disease’, though sporadic cases do occur.

Case report
A 21-year-old student presented to the emergency department with a week’s history of malaise, worsening sore throat, and fevers. She had difficulty eating and drinking due to pain, and developed swelling over the left side of her neck. On examination, she was febrile and had moderate bilateral tonsillar enlargement with exudates, and tender anterior cervical lymph nodes. The primary diagnosis was tonsillitis and after taking a throat swab and blood samples including blood cultures, she was started on intravenous penicillin, fluids, and analgesia.

Laboratory findings included elevated inflammatory markers and a low platelet count. A heavy growth of *Streptococcus* group C was isolated from a throat swab culture. This pathogen could have accounted for the patient’s tonsillitis. *F. necrophorum* was isolated from blood culture and led to the diagnosis of Lemierre’s syndrome.

Intravenous penicillin was changed to amoxicillin and metronidazole. The patient deteriorated with worsening neck pain and persisting fevers. A contrast CT of the neck showed a filling defect in the left retromandibular vein and thrombosis in the left IJV consistent with Lemierre’s syndrome [Figure 1], and a CT chest revealed septic pulmonary emboli. The patient underwent bilateral tonsillectomy and continued on one month of oral amoxicillin and metronidazole. The patient had an uncomplicated and full recovery.

Discussion
Lemierre’s syndrome is rare with a low annual incidence of 3.6 cases per million people, which rises to 14.4 cases per million people in the age group of 14 to 24 years. There is no clear evidence of gender
predominance and overall increase in the incidence of this disease.\textsuperscript{5}

The pathogenesis is thought to be linked to antecedent viral infection. For example, Epstein Barr virus replication may alter the pharyngeal mucosa and facilitate bacterial penetration and local invasion.\textsuperscript{5,6} Several cases of Lemierre's syndrome post-viral and bacterial infections have been reported.\textsuperscript{7} \textit{F. necrophorum} has strong endotoxic properties with increased leucotoxin production. It is thought that the organism invades the pharyngeal space and IVJ via the haematogenous route or via the lymphatic system causing thrombophlebitis.\textsuperscript{8} Direct spread of the infection from the tonsil into the loose connective tissue of the pharynx is another possibility.\textsuperscript{9} Serious complications are possible and include septic pulmonary emboli, infection of the large joints, and abscesses in various tissues, predominantly brain, liver and spleen.\textsuperscript{5,10}

Treatment involves abscess drainage and prolonged antimicrobial treatment, commonly metronidazole plus penicillin, due to the frequent involvement of mixed organism. The use of anticoagulants is controversial.\textsuperscript{5}

It is important to consider Lemierre’s syndrome in patients with persistent or worsening pharyngitis. In those circumstances, blood cultures are essential as they can direct patient management if an organism such as \textit{F. necrophorum} is detected. Radiologic imaging studies are necessary to demonstrate possible thrombosis.

**Figure 1.** CT scan with contrast of the neck showed a filling defect in the left internal jugular vein (IJV).

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**Author information:**
Maryam Nejat, Microbiology Registrar, PhD, Anja M Werno MD PhD, Microbiology Department, Canterbury Health Laboratories, Christchurch, New Zealand

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**Correspondence:**
URL:
REFERENCES: