

## Lemierre's Syndrome: An Unusual Cause of Calf Abscess

### Dear Editor,

Lemierre's syndrome is a rare disease caused by *Fusobacterium necrophorum*, a Gram-negative anaerobic bacillus that is associated with oropharyngeal infections. We describe a case of a 16-year-old male presenting with acute calf abscess caused by an unusual organism, *Fusobacterium necrophorum*. Based on our review, this is the first published report where a calf abscess was the presenting feature of Lemierre's syndrome.

### Case History

A previously healthy 16-year-old male student with hereditary multiple exostosis presented with a 2-day history of atraumatic, acute pain and swelling in the left calf. He had a preceding history of fever and sore throat 2 weeks prior to the current presentation, and was managed in another healthcare institution for upper respiratory tract infection with resolution of his symptoms.

On admission, he was alert and non-toxic. He was febrile with an oral temperature of 39°C and tachycardic at 142 beats/min. His blood pressure was 111/65 mmHg. The left calf was erythematous, swollen and tender, especially over the posterior aspect of the proximal calf.

Investigations showed markedly raised inflammatory markers with a white cell count of  $31.7 \times 10^9/L$  and a C-reactive protein of 355 mg/L. MRI of the left calf showed fluid signal in the deep fascia and intermuscular plane suspicious for fasciitis, a proximal calf abscess, as well as possible early osteomyelitis of the proximal tibia and fibula (Fig. 1). Human immunodeficiency virus (HIV) and diabetic screen were negative (fasting glucose was 4.6 mmol/L and HbA1c was 6.0%). He underwent emergency fasciotomy and debridement of the left calf with application of a vacuum-assisted closure dressing on the same day of admission. Intraoperatively there was frank pus in the deep posterior compartment, as well as a bony defect in the head of the fibula suspicious for osteomyelitis. The fascia and muscles of the superficial deep, lateral and anterior compartments were healthy with no collection. The patient was started on empirical intravenous cefazolin prior to the definitive culture results.

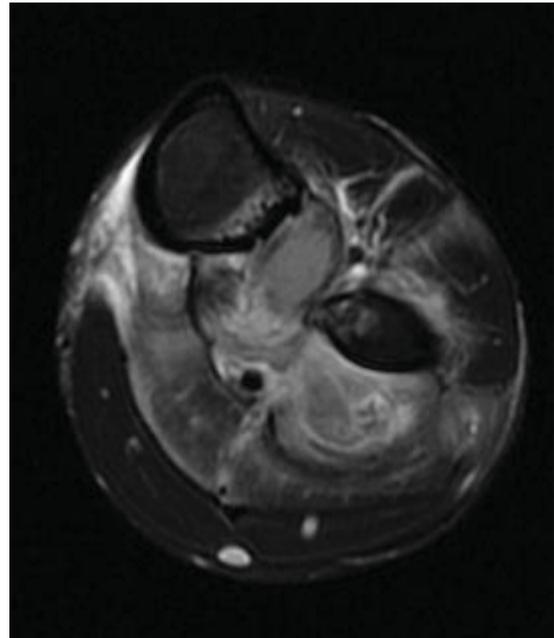


Fig. 1. MRI T2-weighted fat suppressed axial cut of the left calf showing an abscess in the deep posterior compartment.

Blood cultures and intraoperative tissue cultures grew gram-negative rods on Day 2 of admission, from which *Fusobacterium necrophorum* was isolated. Referral was made to the Infectious Disease specialist and antibiotic therapy was changed to intravenous penicillin and metronidazole when the culture results were available. A diagnosis of Lemierre's syndrome was made and further work up was done to exclude associated pathology. These included a CT pulmonary angiogram and ultrasonography of the jugular veins to exclude associated pulmonary embolism and jugular vein thrombosis. CT pulmonary angiogram revealed left lower lobe consolidation but no pulmonary emboli. There was no ultrasonic evidence of jugular vein thrombosis.

The patient responded positively to the surgical drainage of the calf abscess and intravenous antibiotics regime. The inflammatory markers showed a corresponding downward trend. By Day 8 of admission, C-reactive protein had come down to 45 mg/L and white cell count was  $6.5 \times 10^9/L$ . The patient underwent a repeat wound debridement and

diagnostic knee arthroscopic washout for an associated knee effusion on the 4th day of admission. Gram stain and culture of the straw-coloured knee aspirate and subsequent tissue cultures were negative. He underwent a third debridement and secondary suture of the wound on Day 8 of admission. A repeat chest X-ray also showed interval improvement of the left sided pneumonia.

The intravenous antibiotics regime was continued for 19 days in total. He was discharged with a further 2 weeks of oral clindamycin.

## Discussion

It is unusual for a young, healthy individual to present with deep soft tissue infection. The at risk patient group include those with underlying diabetes mellitus and immunocompromised states such as in those with HIV infection or malnutrition.<sup>1</sup> Screening for associated conditions in the low-risk group of individuals is recommended.<sup>2</sup>

*Fusobacterium necrophorum* is an anaerobic Gram-negative bacillus implicated in the rare Lemierre's syndrome, described by Andre Lemierre<sup>3</sup> in 1936, a French microbiologist and physician. He reported a case series of 20 patients who had oropharyngeal infections followed by anaerobic septicaemia and metastatic abscesses. He referred to it as "post-anginal septicaemia" and believed that the clinical manifestations were so characteristic that in diagnosis "mistake is almost impossible".

Lemierre's syndrome usually affects young healthy adults, with a male preponderance (2:1 ratio),<sup>4</sup> although the reason for this is unclear. The causative organism in Lemierre's syndrome is *Fusobacterium necrophorum*, commonly reported as part of the normal oral flora, however the evidence for this is weak.<sup>5</sup>

Riordan<sup>5</sup> proposed the following diagnostic criteria for Lemierre's syndrome (i) a history of anginal illness or compatible clinical findings, (ii) evidence of either metastatic lung lesions or metastatic lesions in other sites, and (iii) evidence of internal jugular vein thrombophlebitis or isolation of *Fusobacterium necrophorum* from blood culture.

Classically the first symptom is a pharyngitis or sore throat, followed by fever. There is commonly neck pain due to thrombophlebitis or thrombosis of the internal jugular vein with seeding of septic emboli that usually migrate to pulmonary capillaries.<sup>6</sup> As a result, the most frequent site of septic metastases are the lungs, with pleuropulmonary complications such as empyema or lung abscess occurring in 92% of cases in a recent case review by Riordan.<sup>5</sup> The most common extrapulmonary complication is septic arthritis (the hip being the most common, followed by

the knee and shoulder).<sup>5</sup> Case reports have also described gluteal muscle abscesses, hepatic and splenic abscesses.<sup>7-9</sup> Other rarer complications reported include endocarditis<sup>10</sup> and meningitis.<sup>11</sup> Based on our review, this is the first case report where a calf abscess was the presenting feature of Lemierre's syndrome. The common organisms associated with musculoskeletal soft tissue infections are *Staphylococcus aureus* and  $\beta$ -haemolytic streptococci.<sup>12</sup>

Antibiotic therapy is usually with a combination of intravenous penicillin and metronidazole or monotherapy with clindamycin for at least 2 weeks before switching to oral antibiotics to complete a total of up to 6 weeks therapy.<sup>4,5</sup>

In our case, the initial focus of infection with *Fusobacterium necrophorum* was likely a sore throat 3 weeks prior to admission with metastatic septic seedings to the lung causing a left sided pneumonia and the calf causing a deep calf abscess. The principles of management of deep soft tissue abscess include early diagnosis, emergent surgical drainage and targeted antibiotic treatment based on culture and susceptibility results. These principles were adhered to in our management of this patient. Based on the culture results, further investigations were performed to exclude septic emboli in other associated sites including the internal jugular vein and chest. Our patient fulfilled all the diagnostic criteria of Lemierre's syndrome.

## Conclusion

This case report highlights the principles of management of deep soft tissue infection in a young, healthy individual and the uncommon condition of Lemierre's syndrome.

*Fusobacterium necrophorum* infections are rare, and if isolated, need to be considered as part of the Lemierre's syndrome, especially in a young individual with a preceding history of an oropharyngeal infection. Additional investigations are indicated to exclude associated pathology.

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Tamara Soh, <sup>1</sup>MBBS (London), Mui Hong Lim, <sup>1</sup>MBBS (Singapore),  
FRCSed (Orth), FAMS

<sup>1</sup>Department of Orthopaedic Surgery, Tan Tock Seng Hospital, Singapore

Address for correspondence: Dr Tamara Soh, Department of Orthopaedic Surgery, Tan Tock Seng Hospital, 11 Jalan Tan Tock Seng, Singapore 308433.  
Email: tamarasoh@gmail.com