Journal of Postgraduate Medicine

Volume 49, Issue 2, April-June, 2003
Print ISSN 0022-3859 CD ISSN 0972-2823

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Over a period of 4 days, a previously fit and well 22-year-old man came twice to the emergency department with a history of sore throat, fever and neck pain for several days. At each visit he was treated symptomatically with paracetamol and sent home. Two days after the second visit, he was admitted to hospital with continuing sore throat and production of green sputum, fever, rigors and sudden onset of moderately severe abdominal pain localized to the right iliac fossa. His bowel function was normal and he had not lost weight. On direct questioning, he admitted to mild chest pain which appeared to be pleuritic in nature.

Clinical examination revealed a raised temperature at 37.9°C, a pulse of 100/min and blood pressure of 91/52 mmHg. The throat was erythematous and there was a swollen tender lump in the right anterior triangle of his neck. Oxygen saturation was 99% on room air. Abdominal examination revealed mild tenderness in the right iliac fossa.

Initial investigations revealed haemoglobin concentration of 13.7 g/l. The leucocyte count was 21.85 x 10^3/ul with polymorphs accounting for 91% of leucocytes. The platelet count was 122x10^3/ul, C-reactive protein level was 280 mg/l and the serum levels of hepatic transaminases were normal. However, later the serum level of aspartate transaminase was found to be elevated [59 IU/l (normal <35 IU/l)]. The serum concentration of sodium was 133 mmol/l, potassium 4.6 mmol/l, urea 10.8 mmol/l creatinine 169 umol/l, and serum amylase 57 U/dl. The chest radiograph was unremarkable.

He was admitted, initially, under the surgeons for atypical acute abdominal emergency possibly due to appendicitis. His clinical condition was monitored and he was managed conservatively with administration of intravenous fluids and analgesics and withdrawal of any oral intake.

What were the possible causes of this patient's sore throat?

Possible causes include:
1. Viral infections: Viruses (such as rhinoviruses, adenoviruses, parainfluenza viruses and herpes simplex virus) are responsible for up to 70% of episodes of sore throats.
2. Bacterial infections: Streptococcus pyogens (group A B-haemolytic), Corynebacterium diphtheriae, Borrelia vincenti and fusiform bacilli are the common bacteria that are responsible for bacterial sore throat.

What was the clinical diagnosis in the third emergency visit?

1. Lemierre syndrome
2. Acute appendicitis and concomitant pharyngitis

The constellation of manifestations such as persistent pharyngitis, tender swelling along the sternocleidomastoid muscle, acute chest pain and subsequent sepsis suggested a diagnosis of Lemierre Syndrome, first described in 1939. The tender neck swelling is related to septic thrombosis of the internal jugular vein while the chest pain is indicative of septic embolisation.

What are the various organisms associated with Lemierre syndrome?

1. Fusobacterium necrophorum is responsible for approximately of 70% cases
2. Other bacteria that are responsible, with or without concomitant F. necrophorum infection, include: Fusobacterium nucleatum, streptococcus species and Peptostreptococcus species. Fusobacterium necrophorum, unlike other anaerobes, is frequently isolated as a single pathogen and has been noted to possess unique virulence factors, which include lipopolysaccaride endotoxins and the ability to produce thrombosis.

What is the usual course of this syndrome?

The syndrome progresses through three stages:
1. Primary infection: Pharynx (87%) is the usual site of primary infection, although other facial sites such as ear (otitis media) can also serve as the sites of primary infection.
2. Local invasion: Invasion of the lateral pharyngeal space
and internal jugular vein constitutes the second phase. This results in septic thrombosis (71%).

3. Metastatic complications can be present in 90% of cases at the time of diagnosis.4

The interval between the pharyngitis and metastatic infection is usually less than a week.3 Our patient developed the first signs of sepsis four days after pharyngitis when he presented for the third time and was admitted.

Should the patient have been given antibiotic for pharyngitis at this point?

The commonest causes of pharyngitis are viruses, for which antibiotics are not needed. However, this patient had persistent and worsening sore throat, green sputum and fever. Therefore antibiotics should have been given.

Three days into admission, he suddenly deteriorated with high fever, rigors, right-sided pleuritic chest pain, hypoxia and generalized abdominal pain and tenderness. Arterial blood gases were PO2 9.5 Kpa, PCO2 5.4 Kpa on 2 litres of oxygen. The surgeons decided to operate on him, because of his deteriorating condition, and he was given a third generation cephalosporin (Cephotaxim) prior to surgery.

An exploratory laparotomy was performed at which the only abnormality found was a moderate hepatosplenomegaly. An appendicectomy was also carried out. However, the histological examination of the excised tissue did not reveal any signs of inflammation or infection. At this stage, the case was referred to a medical team. The patient was admitted to the intensive care unit (ICU), as he could not be weaned off ventilation postoperatively. A revised working diagnosis of septic shock was made.

What was the original description of the syndrome?

“The appearance and repetition of, several days after the onset of a sore-throat (particularly tonsillar abscess) of severe pyrexial attacks and an initial rigor or pulmonary infarcts and arthritic manifestations, constitute a syndrome so characteristic that a mistake is almost impossible”.2

This patient had pharyngitis, tender and swelling neck and non-cavitating lung infiltrates consistent with the changes noted in the classical triad of Lemierre syndrome in the antibiotic era. In addition, he had elevated white blood cell count, and high fever. A recent case series has pointed out that these manifestations are commonly encountered with Lamierre Syndrome.5

What was the unusual manifestation in this case?

Other sites of metastatic infections include joints, bone, liver, spleen, skin, soft tissue, and meninges. However, presentation mimicking acute appendicitis is unusual and has rarely been reported.5,6

What are the complications?

The syndrome is associated with significant morbidity, especially if it is not diagnosed and treated early. Mortality rate is approximately 6.4%.4

In the ICU, the patient initially needed full ventilatory support. A repeat CXR showed pulmonary infiltrates and pleural effusion consistent with adult respiratory distress syndrome (ARDS). He was treated with broad-spectrum antibiotics. The blood culture grew F. necrophorum. A diagnosis of Lemierre syndrome was made and Sensitivity tests confirmed susceptibility to penicillin and Clindamycin. Cultures of throat, peritoneum, urine, and stool specimens were sterile.

What other investigations may be done to confirm the diagnosis?

1. Doppler ultrasonography to evaluate jugular thrombosis.7
2. Computerized tomography (CT) scan of the neck.8
3. Magnetic resonance imaging (MRI).9

What are the treatment options?

The patient should receive appropriate antibiotic therapy.3 F. necrophorum, the commonest organism responsible for the condition is susceptible to penicillin. However, some of its strains are known to produce beta-lactamases. Therefore, antimicrobial agents resistant to beta-lactamases should be used prior to obtaining culture and sensitivity reports.11 The duration of antibiotic treatment has varied widely in the two case series (with median of 38 and 42 days and the corresponding range of 9-128 days and 7-84 days, respectively).3,7 Surgical drainage should be undertaken, if indicted. The role of anticoagulation and internal jugular vein ligation is considered controversial.8,10

Why is it important to recognize this syndrome?

The delay in diagnosis and appropriate management of his condition may have contributed to the subsequent stormy course. The clinical picture of a young adult or adolescent
The delay in diagnosis and appropriate management of his condition may have contributed to the subsequent stormy course. The clinical picture of a young adult or adolescent presenting with sepsis after a sore throat should alert the clinicians regarding a possible diagnosis of Lemierre syndrome. In these patients early blood cultures and careful examination of the neck may aid a rapid diagnosis and avoid further complications or unnecessary interventions.

Imaging of the neck was deemed unnecessary, as he was very ill in ICU, and imaging would not have changed his management.

He was started on intravenous penicillin and metronidazole. His clinical improvement was slow, with the fever persisting for 10 days. He developed bilateral pleural effusions and right lower lobe consolidation but there was no evidence of endocarditis. He was eventually discharged from the hospital after 4 weeks, having completed a 21-day course of penicillin and metronidazole. His CRP and WBC reverted to normal levels prior to his discharge from hospital.

References