

## CASE REPORT

# Necrobacillosis (Lemmiere's syndrome): a rare cause of necrotizing pneumonia

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*Necrobacillosis (Lemmiere's syndrome): a rare cause of necrotizing pneumonia. R.S. Dykhuizen, E.S. Olson, S. Clive, J.G. Douglas. ©ERS Journals Ltd 1994.*

**ABSTRACT:** The cases of four young and previously healthy patients with necrobacillosis are reported. All four patients presented with acute pharyngotonsillitis and pulmonary infiltrates due to metastatic abscesses, and had neutrophil leucocytosis and hypoalbuminaemia. Blood cultures grew *Fusobacterium necrophorum* and each patient responded to metronidazole.

This syndrome deserves wider recognition.  
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The syndrome of postanginal septicaemia with metastatic abscesses, most commonly in the lung, due to the anaerobe *Fusobacterium necrophorum*, was first described by LEMMIERE [1] in 1936. In the preantimicrobial era, the syndrome carried a mortality of around 45% [2], and only two patients from Lemmiere's 20 reported cases survived.

The syndrome appears to be rare [3, 4], but within a 3 year period, between 1991 and 1994, we encountered four cases in our unit, two of them within a fortnight! Recognition of the syndrome is important to allow immediate appropriate therapy, as microbiological confirmation may take up to a week.

## Case reports

### Case 1

A 25 year old male engineer presented with a 9 day history of sore throat. For 4 days, despite a course of phenoxymethylpenicillin, he had suffered fatigue, headaches, arthralgia and rigors. On admission, his temperature was 39.8°C and examination of the pharynx revealed bilateral tonsillitis. Chest radiograph showed no abnormality. White cell count was  $15.5 \times 10^9$  cell·l<sup>-1</sup> (granulocytosis with left shift), platelet count  $195 \times 10^9$  platelets·l<sup>-1</sup> and albumin 26 g·l<sup>-1</sup>. Haematuria was observed by urinalysis (dipstick). Epstein-Barr virus serology and antistreptolysin titres were negative.

The patient was started on oral erythromycin, but on the second day he developed pleuritic chest pain with swinging pyrexia. Repeat chest radiograph the third day after admission showed areas of consolidation, with cavitation in both lung fields (fig. 1). An echocardiogram showed no evidence of right-sided bacterial endocardi-



Fig. 1. – Chest radiograph of patient No. 1 showing multiple lung abscesses in both lung fields and a small left-sided pleural effusion.

tis. Therapy was changed to intravenous amoxycillin, flucloxacillin and metronidazole, and the patient's clinical condition started to improve. After 7 days incubation, anaerobic blood cultures taken on admission grew Gram-negative bacilli, which were identified as *Fusobacterium necrophorum*. Intravenous antimicrobial therapy was stopped after 7 days and oral metronidazole continued for 6 weeks. After 8 weeks, the chest radiograph showed resolution of the cavitation, with some residual scarring in both mid zones, and pleural thickening at the left base with minimal elevation of the left hemidiaphragm.

### Case 2

An 18 year old male shop worker had been treated at home with erythromycin for a sore throat. After finishing a 7 day course, he became unwell again with fatigue, back pain, rigors, left-sided pleuritic chest pain and haemoptysis.

On admission his temperature was 40.5°C. Examination of the throat revealed no abnormality, but on auscultation, crepitations and a pleural rub were heard in the left axilla. A chest radiograph showed patchy consolidation in both lung fields, with cavitation. White cell count was  $27.9 \times 10^9$  cells·l<sup>-1</sup> (granulocytosis with left shift), platelet count  $120 \times 10^9$  platelets·l<sup>-1</sup> and albumin level 23 g·l<sup>-1</sup>. There was no haematuria. Epstein-Barr virus serology and antistreptolysin titres were negative.

Intravenous cefotaxime was administered, and metronidazole was added after 2 days when cavitation became apparent. After 3 days incubation, blood cultures taken on admission grew *Fusobacterium necrophorum*. The patient received one week of intravenous metronidazole plus benzylpenicillin followed by 5 weeks of oral metronidazole, by which time the chest radiograph had returned to normal.

### Case 3

An 18 year old female apprentice motor mechanic was admitted because of severe sore throat for 4 days, having received oral erythromycin for 2 days. On examination, she appeared unwell with generalized arthralgia and a temperature of 38.5°C. Marked trismus was present and gross enlargement of the right tonsil with exudate and tender submandibular lymphadenopathy. She complained of pleuritic chest and left shoulder tip pain, but physical examination and chest and abdominal radiographs revealed no abnormality. White cell count was  $12.6 \times 10^9$  cells·l<sup>-1</sup> (granulocytosis with left shift), platelet count  $124 \times 10^9$  platelets·l<sup>-1</sup> and albumin 24 g·l<sup>-1</sup>. Haematuria was demonstrated during urinalysis (patient was not menstruating). Epstein-Barr virus serology and antistreptolysin titres were negative.

Erythromycin was administered intravenously. After 4 days incubation, blood cultures taken on admission grew *Fusobacterium necrophorum* and repeat chest radiography then showed consolidation in the left lower zone, with cavitation and tenting of the hemidiaphragm. Therapy was changed to oral metronidazole for 6 weeks, with good clinical response. The chest radiograph returned to normal within 3 weeks.

### Case 4

A 16 year old schoolgirl presented with a 2 week history of sore throat. She was prescribed phenoxymethylpenicillin, but developed a rash after 2 days. Therapy was changed to erythromycin. She developed pain down the left side of her neck, arthralgia, left-sided pleuritic chest pain and rigors. On examination, her temperature

was 38.5°C. There was a tender swelling on the left side of her neck along the anterior aspect of the sternocleidomastoid muscle. Severe trismus prevented examination of her throat. Chest radiography showed patchy consolidation in both lung fields, with cavitation. Doppler examination of her neck revealed thrombosis of the internal jugular vein. White cell count was  $23.4 \times 10^9$  cells·l<sup>-1</sup> (granulocytosis with left shift), platelet count  $124 \times 10^9$  platelets·l<sup>-1</sup> and albumin 23 g·l<sup>-1</sup>. Haematuria was demonstrated during urinalysis (patient was not menstruating). Epstein-Barr virus serology and antistreptolysin titres were negative.

Necrobacillosis was diagnosed clinically on admission and intravenous metronidazole and cefotaxime administered. After 5 days incubation, blood cultures taken on admission grew both *Bacteroides fragilis* and *Fusobacterium necrophorum*. There was good clinical response to therapy. Cefotaxime was discontinued after 5 days, and oral metronidazole continued for a further 5 weeks, by which time the chest radiograph had returned to normal.

### Discussion

The differential diagnosis of necrotizing pneumonia includes: infection due to anaerobes in aspiration pneumonia or behind an obstruction in bronchial carcinoma, tuberculosis, and primary infections due to organisms such as *Staphylococcus aureus*, *Streptococcus pyogenes*, *Nocardia spp.* or *Klebsiella pneumoniae*. As these four cases illustrate, necrobacillosis should be suspected in previously healthy adolescents and young adults who, after an initial sore throat, develop a severe septicaemic illness with cavitating pulmonary consolidation. Metastatic abscesses are common and usually involve the lung, with associated pleuritic chest pain and haemoptysis. Multisystem involvement also occurs and can include articular and bone lesions, jaundice and renal failure. The causative organism, *Fusobacterium necrophorum*, is an anaerobe, which is a normal commensal of the oropharynx, genitourinary and alimentary tracts. The organism is thought to gain entry *via* the throat or tonsil, and the characteristic septicaemic illness probably relates to the production of lipopolysaccharide endotoxin and various exotoxins [2].

Although *Fusobacterium necrophorum* is sensitive to a variety of antimicrobials *in vitro*, including chloramphenicol, penicillin G, cefotaxime and imipenem [5], these four cases and other reports suggest that metronidazole is the most appropriate treatment *in vivo* [3, 6]. Betalactamase production has been reported [7]. Confirmation of the diagnosis is obtained by blood culture. After 3–7 days, spindle-shaped, Gram-negative rods may be observed. At this stage, the diagnosis may be confirmed by gas-liquid chromatography. Conventional identification and antimicrobial sensitivity testing may take up to a further week, due to slow growth of the organism. Necrobacillosis is a serious, if uncommon, infection of previously healthy young people and deserves wider recognition.

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#### References

1. Lemmiere A. On certain septicaemias due to anaerobic organisms. *Lancet* 1936; i: 701–703.
2. Sinave CP, Hardy GJ, Fardy PW. The Lemmiere syndrome: suppurative thrombophlebitis of the internal jugular vein secondary to oropharyngeal infection. *Medicine* 1989; 68: 85–94.
3. Moore-Gillon J, Lee TH, Eykyn SJ, Phillips I. Necrobacillosis: a forgotten disease. *Br Med J* 1984; 288: 1526–1527.
4. Moreno S, Altozano JG, Pinilla B, *et al.* Lemmiere's disease: postanginal bacteremia and pulmonary involvement caused by *Fusobacterium necrophorum*. *Rev Infect Dis* 1989; 11: 319–323.
5. Finegold SM. Anaerobic Gram-negative rods: Bacteroides, Prerotella, Porphyromas, Fusobacterium, Bilophia. *In:* Gorbach SL, Bartlett JG, Blacklow NR, eds. *Infectious Diseases*. Philadelphia, 1992; pp. 1571–1579.
6. Eykyn SJ. Necrobacillosis. *Scand J Infect Dis* 1989; Suppl. 62: 41–46.
7. Brook I. Infections caused by betalactamase-producing *Fusobacterium* spp. in children. *Pediatr Infect Dis J* 1993; 12: 532–533.