

## Fatal *Clostridium septicum* infection in a young pregnant woman

### CASE REPORT

A 27-year-old pregnant woman, with no previous medical history, presented to the hospital with a spontaneous abortion at nine weeks' gestation. Curettage was performed. Although there were no clinical abnormalities on physical examination, she complained of intense pain in both legs for one day. Swelling, a purple skin discolouration on the right thigh and signs of crepitus developed during the next night (figure 1). Because of respiratory distress and hypotension, the patient was admitted to the ICU and required mechanical ventilation, volume resuscitation and vasopressor support.

She was febrile (temperature 38.4°C), tachycardic (heart rate 132 beats/min), tachypnoeic (respiratory rate 40 breaths/min), hypotensive (blood pressure 82/50 mmHg), oliguric with dark-brown urine and she had cold extremities. Laboratory examination showed an ESR 13 mm/hour (0-20 mm/hour), Hb 9.5 mmol/l (7.5-10.0 mmol/l), Ht 0.44 l/l (0.36-0.46 l/l), MVC 88 (80-100), leucocytes 10.3/nl (4-11/nl) with left shift, platelets 226/nl (150-400/nl), D-dimer 25.61 µg/ml, ASAT 538 U/l (0-45 U/l), ALAT 140 U/l (0-45 U/l), CK 23953 U/l (0-170 U/l), LD 1349 U/l (0-450 U/l), CRP 343 mg/l (0-5 mg/l), and lactate 5.8 mmol/l (0.5-1.5 mmol/l). Arterial blood gas showed a pH 7.28 (7.35-7.45), PaCO<sub>2</sub> 3.1 kPA (4.5-6.0 kPA), PaO<sub>2</sub> 40.6 kPA (9.5-13.0 kPA), HCO<sub>3</sub><sup>-</sup> 10.2 mmol/l (22-26 mmol/l), BE -14.6 mmol/l (-2.0-2.0 mmol/l), and SaO<sub>2</sub> 86% (92-99%) with 10 l/min O<sub>2</sub>. Body CT scan showed gas in and extensive destruction of the muscles of the legs, pelvis, abdomen and back and gas bubbles in the venous system (figure 2).

Piperacillin/tazobactam and clindamycin were started and emergency exploration, debridement and bilateral upper leg amputation were performed (figure 3). Radical resection was not possible due to the extent of the myonecrosis. Perioperatively hypotension and metabolic acidosis worsened as a sign of refractory toxic shock syndrome. Hyperbaric oxygen therapy was considered, but the patient was too unstable for transportation to a hyperbaric facility. Gram stains of muscle (figure 4) and blood (figure 5) showed Gram-positive rods. Cultures revealed *Clostridium septicum*, confirming the diagnosis gas gangrene.

Patient developed a progressive toxic shock and refractory hypotension and died approximately 30 hours after admission to the ICU.

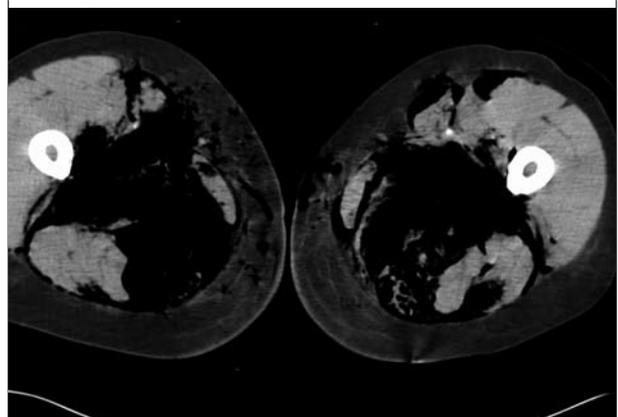
### DISCUSSION

Myonecrosis, or necrotising myositis, can be caused by *Clostridium* species and group A *Streptococcus*.<sup>1</sup> Three types of clostridial soft tissue infection have been described: simple wound contamination, anaerobic cellulitis and myonecrosis.<sup>2</sup> Myonecrosis can occur in three different settings: traumatic, recurrent and non-traumatic or spontaneous. The third is most commonly caused by *C. septicum*, which produces four toxins (alpha, beta, gamma and delta toxin) and is aerotolerant. Typical is the acute invasion of healthy muscle, producing an anaerobic environment and acid pH which is optimal for growth of clostridial organisms. The mean incubation time is less than 24 hours. The first symptom is usually acute onset of severe pain.<sup>3</sup> The skin over the infected area becomes tense, tender and

**Figure 1.** Progressive swelling of the legs and a purple skin discolouration on the right thigh



**Figure 2.** CT scan with gas within the soft tissue and in the venous system and destruction of the muscles of the legs, pelvis, abdomen and back



**Figure 3.** Peri-operative illustration of right upper leg musculature: oedematous with a blue to black discolouration



**Figure 4.** Gram stain of muscle showing Gram-positive rods



**Figure 5.** Gram stain of the blood showing Gram-positive rods



may appear purplish-red. Signs of systemic toxicity develop rapidly.<sup>4</sup> Gas in the soft tissue supports the diagnosis. Definitive diagnosis is made by demonstrating large, Gram-positive rods. Debridement is mandatory and a combination of penicillin and clindamycin is warranted. The use of hyperbaric oxygen is controversial and the aerotolerance of *C. septicum* may reduce its efficacy.<sup>5</sup> Gas gangrene is a rapidly progressive and often lethal disease. Early recognition and aggressive surgical and antibiotic treatment are essential. The mortality of traumatic gas gangrene is greater than 25%, but mortality from spontaneous gas gangrene ranges from 67 to 100%, with the majority of deaths occurring within 24 hours of onset. Toxic shock syndrome with fatal consequences due to *Clostridium* infection has been described after abortion.<sup>6</sup>

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