EMERGENCY CASEBOOK

Non-traumatic clostridium infection: report of an unusual case with rapid progression and a paucity of clinical signs in a patient with type 1 diabetes

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The number of cases of non-traumatic, spontaneous clostridial gas gangrene is increasing, and is an area of major concern for awareness by doctors.¹ The disease is associated with high mortality, and survival is directly related to rapid diagnosis and prompt institution of appropriate antibiotics, surgical debridement and hyperbaric oxygen therapy. The dilemma is that early diagnosis cannot be firmly made on clinical findings alone, as these may not appear until very late, as in our patient, jeopardising the chances of the patient's survival. Mortality increases substantially in the absence of surgical treatment.² Therefore, it could be suggested here that early surgical evaluation is needed, which could help in timely diagnosis, in patients with pain out of proportion to clinical findings, especially when no other plausible cause could be found.

CASE REPORT

An 85-year-old man with a history of type 1 diabetes and iron-deficiency anaemia presented with 1 day of gradual onset of right hip and thigh pain. He had awoken from sleep with pain that gradually got worse. He was evaluated by his general practitioner, who did not report any abnormalities of the leg, and was given some analgesics. His pain worsened throughout the day and he was brought to the emergency department. He had no history of trauma.

In the recent past, he had had 3 units of blood transfused owing to low haemoglobin, after which he was sent home with plans for a barium enema. A recent upper gastrointestinal endoscopy with distal duodenal biopsy was reported to be normal.

He had a temperature of 36.8°C, a pulse rate of 89/min, a respiratory rate of 16/min and a blood pressure of 152/98 mm Hg. Initial physical examination showed no sign of cellulitis, vascular insufficiency or evidence of any injury. Neurological examination was normal. Symptomatic treatment was prescribed. Over the next couple of hours the pain increased, and repeat examination showed bluish discoloration of skin, with one large bulla on the medial side of the thigh. Crepitation was present up to the knee. Although his vital signs had remained stable up to this stage, his white cell count was $28.3 \times 10^9/l$ (neutrophil count $27.17 \times 10^9/l$), haemoglobin was 10.8 g/dl, platelet count was $496 \times 10^9/l$, and urea and creatinine were within normal limits. Fluid from the bulla contained Gram-positive rods and scanty white cells. An x ray film showed gas in the tissue of the right thigh and buttock.

The advanced stage of the disease and progressive hypotension precluded surgical intervention. The patient was treated with facemask oxygen, fluids and penicillin G 2.4 g every 6 h, ceftazidime 1 g every 8 h and clindamycin 600 mg every 6 h. Within 6 h of admission, he sustained cardiopulmonary arrest. He was not resuscitated, in

accordance with his wish. He was pronounced dead <24 h from the onset of his symptoms. An autopsy was not performed. Culture of fluid from a bulla yielded *Clostridium septicum* growth after 48 h of incubation.

DISCUSSION

Clostridial gas gangrene most often occurs in a contaminated wound after traumatic injury or a surgical procedure. *C. perfringens* is the aetiological organism in most of these cases.³ *C. septicum* is a major cause of spontaneous, non-traumatic gas gangrene. Unlike *C. perfringens*, *C. septicum* is relatively aerotolerant and thus seems to be more capable of initiating infection in the absence of obvious damage to tissues.³ It nearly always occurs in association with underlying diseases. The disorders most commonly associated with non-traumatic gas gangrene include malignancy, diabetes, peripheral vascular disease and immunodeficiency.¹ All of these conditions provide the acidic and anaerobic environment in which clostridial organisms can grow.

Infection progresses in a fulminating manner; most of the patients die within 24 h of onset; hence prompt diagnosis and treatment are absolutely essential. Regrettably, the initial signs and symptoms are non-specific.² As early diagnosis is critical to the patient outcome, Cline and Turnbull⁴ recommended that diagnosis can be made confidently on the basis of four early clinical findings: (1) pain disproportionate to clinical findings or injury, (2) marked tachycardia, (3) discoloured and oedematous skin, and (4) Gram staining of the bulla showing Gram-positive bacilli and few leucocytes.

Stevens *et al*⁵ in 1990 reported six cases of spontaneous, non-traumatic clostridial gangrene; all these patients had the four clinical findings of Cline and Turnbull, but four of the six died within 24 h of onset; two survived owing to early surgical exploration and multiple debridements.³

Smith-Slatas *et al*² reviewed the paediatric cases published in the English-language literature and identified 47 cases of *C. septicum* infection. The finding was that nearly half of the patients died without surgical intervention, compared with 16 of 47 (34%) patients who survived after surgical intervention. Smith-Slatas *et al*² also concluded that most (84%) survivors underwent therapeutic surgical intervention compared with only 12% of the non-survivors.² This conclusion was consistent with that of Bratton *et al*,⁵ who noted that a higher percentage of the survivors than nonsurvivors had early surgical intervention.

In the case presented here, our patient had only the first of the Cline and Turnbull clinical findings throughout the major course of the illness, and the rest of the findings appeared no longer than 4 h before the patient's death. This made an early diagnosis difficult and prevented therapeutic surgical treatment to be initiated quickly. An important issue that arises from this case is whether there is any place of surgical exploration for the early diagnosis of the disease, and not just for the treatment?" Because the clinical presentation of

non-traumatic clostridial infection is non-specific, and the disease course extremely rapid as in our patient, it is evident that the key factor in providing appropriate and effective treatment is an early diagnosis.

Competing interests: None declared.

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REFERENCES

- 1 **Samlaska CP**, Maggio KL. Subcutaneous emphysema. *Adv Dermatol* 1996;**11**:117–51.
- 2 **Smith-Slatas CL**, Bourque MC, Salazar JC, *et al*. Clostridium septicum infections in children: a case report and review of the literature. *J Am Acad Paediatr* 2006;**117**:796–805.
- 3 **Stevens DL**, Musher DM, Watson DA, *et al*. Spontaneous, nontraumatic gangrene due to clostridium septicum. *Rev Infect Dis* 1990;**12**:286–96.
- 4 **Cline KA**, Turnbull TL. Clostridial myonecrosis. *Ann Emerg Med* 1985;**14**:459–66.
- 5 **Bratton SL**, Krane EJ, Park JR, *et al*. Clostridial Septicum infections in Children. *Pediatr Infect Dis J* 1992;**11**:569–75.