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Spontaneous gas gangrene in a patient with Crohn's disease

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Summary

Background:

Spontaneous gas gangrene is necrosis of muscles in the absence of trauma, causing an acutely painful and potentially fatal condition. However, the occurrence of this condition in Crohn's disease has been very rarely documented.

Case Report:

In this extremely rare case we describe an occurrence of spontaneous gas gangrene, in a known case of Crohn's disease. The patient presented with fever and pain in the left arm and abdomen. After admission and initial management with antibiotics, the patient developed crepitus in the arm and myonecrosis necessitating a fasciotomy and later an emergency amputation of his left upper limb.

The pathogenesis of gas gangrene in inflammatory bowel disease is not fully understood. Management includes aggressive antibiotic administration followed by amputation of the non-salvageable limb.

Conclusions:

A high index of suspicion of such rare complications is a must and surgical intervention is life saving; however, the efficacy of anti-gas gangrene serum is controversial. We recommend use of a multipronged approach in such cases with high mortality rates.

key words:

spontaneous gas gangrene • Crohns disease • fasciotomy

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BACKGROUND

Crohn's disease is an inflammatory bowel disease involving all layers of the bowel wall and occurring most commonly at the ileo-caecal junction. As the disease progresses, it can lead to perforation of the bowel wall, formation of strictures, adhesions and fistula formation [1].

However, occurrence of spontaneous gas gangrene is a very rare complication.

Gas gangrene is of 2 major types – traumatic gas gangrene, which accounts for 80% of cases, most commonly caused by *Clostridium perfringens*; and spontaneous gas gangrene, which is caused by *Clostridium septicum* in the absence of trauma.

CASE REPORT

A 70-year-old diabetic man with a significant past medical history of Crohn's disease requiring resection of the affected segment 26 years ago, presented with pain in his left upper arm and mild abdominal discomfort accompanied by fever. There was no history of trauma. On presentation, his Crohn's was stable, having required no active treatment for the last 26 years, and he was not on immunomodulatory therapy. His blood glucose was under control with medication for the last 15 years. On presentation, his vitals were: temperature, 99.4°F; blood pressure, 110/70 mm Hg; heart rate, 80/minute; and respiratory rate, 18/minute.

He was given oral ibuprofen for pain relief and was admitted for observation and assessment with an IV line inserted in the right upper limb. CT scan showed a chronic walled-off perforation with adhesions (Figure 1).

The next morning, he became febrile and developed intense pain and palpable crepitus in his left arm and forearm and appeared toxic. His oxygen saturation dropped (86–88%) and he developed signs of sepsis. His temperature was 103°F, heart rate was 140/minute, and blood pressure was 80/60 mm Hg.

Investigations revealed a low hemoglobin count (9 g/dl), and extremely high C-reactive protein value (407 mg/dl) and serum creatinine (4.5 g/dl). Serum myoglobin was 1256 ng/ml and creatine kinase values were 1443 IU/litre. Gram-positive bacteria with spores were obtained on muscle biopsy. There was widespread myonecrosis in his left upper limb and presence of air bubbles in soft tissues and axilla.

Treatment with penicillin and broad-spectrum antibiotics (piperacillin and tazobactam) was initiated through the IV line in the right upper limb. No injections, either IM or IV, were ever administered on the left upper limb. However, the pain and swelling in the left arm continued to progress, and development of signs of compartment syndrome necessitated performing a fasciotomy to relieve the tension in the limb (Figures 2, 3). Anti-gas gangrene serum was administered 24 hours later. In view of the spreading infection, and deteriorating clinical condition, a decision to amputate the left upper limb was taken to limit the clinical deterioration. Shoulder disarticulation was performed, followed postoperatively by continued antibiotic therapy along with recombinant human activated protein C.

Figure 1. CT scan showing chronic walled-off perforation.

Figure 2. Necrosed, edematous muscles of left upper limb.

Figure 3. Appearance of muscles and soft tissues after fasciotomy.

The patient's condition improved dramatically and his C-reactive protein and serum creatinine levels dropped (Table 1). He was discharged on the fifth day after amputation.

DISCUSSION

Gas gangrene is extremely rare in patients with ulcerative colitis or Crohn's disease. The exact mechanism of causation is unknown, but studies have shown that the alpha-toxin of *Clostridium septicum* is the major virulence determinant in cases of gas gangrene [2].

Table 1. Laboratory investigations of patient.

Parameter (normal range)	Pre-operative	Day 1 post operative	Day 3 post operative
Serum sodium (136 to 144 mEq/L)	140 mEq/L	144 mEq/L	143 mEq/L
Serum potassium (3.7 to 5.2 mEq/L)	3.5 mEq/L	3.6 mEq/L	3.4 mEq/L
C-reactive protein (<10 mg/dl)	407 mg/dl	136 mg/dl	29 mg/dl
Serum creatinine (0.8 to 1.4 mg/dl)	4.5 mg/dl	3.9 mg/dl	1.0 mg/dl

According to some studies, anti-inflammatory drugs and immunosuppressants used to treat Crohn's disease may also play a role in the spread of gas gangrene. In our patient, however, immunosuppressants were not being given.

The mainstay of treatment of gas gangrene is use of broad-spectrum antibiotics like penicillin, clindamycin and metronidazole [3].

Adjuvant therapy in the form of recombinant human activated protein C is given in severe sepsis [4].

Historically, anti-gas gangrene serum along with penicillin had been reported to be effective [5].

Fasciotomy for compartment syndrome may be necessary and should not be delayed in patients with extremity involvement. The definitive treatment in patients with severe

sepsis, as in our case, is amputation of the limb, which becomes necessary and lifesaving.

The mortality of spontaneous gangrene ranges from 67% to 100% [6].

The majority of deaths occur within 24 hours of onset.

CONCLUSIONS

In our case, the advanced age of the patient and his history of diabetes put him at an increased risk of infection in view of his weakened immunity. However, sudden occurrence of spontaneous gas gangrene, albeit a rare complication, needed an aggressive, multipronged approach in treatment. A high index of suspicion of such complications in patients at risk can prove lifesaving.

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