

What you need to know about Spontaneous *Clostridium Septicum* Gangrene

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Short commentary

Clostridial myonecrosis is a rapidly progressing infection affecting subcutaneous and muscle tissues. While usually secondary to traumatic inoculation (accidental or surgical), these infections can, in rare cases, be spontaneous. Unlike *Clostridium perfringens*, responsible for 80% of traumatic gangrene cases, *Clostridium septicum* accounts for 20% of spontaneous gangrene cases and only 1.7% of traumatic cases [1,2].

C. septicum is an opportunistic, anaerobic, mobile, Gram-positive bacillus. Like other species in the *Clostridium* genus, spore production is its method of resistance and dissemination. The digestive carriage of *C. septicum* is lower than that of other *Clostridium* species [3]. A distinctive feature of *C. septicum* is its tendency to cause so-called “spontaneous” infections, meaning without direct inoculation. Its more aerotolerant metabolism allows it to proliferate in healthy tissues [4], and its flagellated nature facilitates tissue invasion [5]. Furthermore, the bacterial load needed to cause infection in mice is 300 times lower than for *C. perfringens*. Another notable virulence factor is its production of toxins, including an endotoxin from the aerolysin family, known as α -toxin, which causes osmotic cell lysis by forming pores in the plasma membrane. *C. septicum* also secretes other enzymes, including β -toxin (DNase), γ -toxin (hyaluronidase), δ -toxin (he-

molysin), neuraminidase, protease, and sialidase, whose roles in pathogenicity are not yet fully understood but seem to contribute to systemic dissemination through tissue destruction [6].

The clinical presentation is characterized by intense myalgias, often reported as disproportionate to the initially minimal clinical lesions. Fever is present in only 40% of cases [7]. The clinical course is fulminant, with hemorrhagic bullae appearing within hours. Subcutaneous gas crepitus, characteristic of gas gangrene, is not systematic and appears later [6]. Myonecrosis can spread at a rate of 2 cm/h [6]. The most commonly found predisposing factors are malignant pathologies, found in 71% of cases, predominantly originating from the digestive tract (53%). Diabetes was present in 41% of adults [6]. The overall mortality rate is estimated at 71% [7].

The diagnosis of spontaneous gas gangrene may be delayed due to the nonspecific initial symptoms, lack of entry point, and rapid progression to septic shock. The diagnosis of clostridial myonecrosis is clinical, and imaging tests should not delay urgent medical-surgical management. Identification of the bacterium can be easily achieved through blood cultures, puncture of hemorrhagic bullae, or surgical specimens. Turban et al. report a positive blood culture rate of 65% in cases [7].

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Debridement surgery of necrotic tissues is essential and should be performed as soon as the diagnosis is suspected, as survival is associated with early management [8]. The initial empiric antibiotic therapy recommended by the Infectious Diseases Society of America (IDSA) includes vancomycin plus piperacillin/tazobactam or a carbapenem. A switch to high-dose penicillin (2-4 million units/4-6h) combined with clindamycin (600-900 mg/8h) is recommended after identification of *C. septicum* [2]. The anti-toxin action of lincosamides justifies the use of clindamycin in these cases.

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