

CASE REPORT



## There may be more than meets the eye with *Clostridium perfringens* bacteremia

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### ABSTRACT

We present the case of an 89-year-old man with a 1 month history of fevers and fatigue. Blood cultures were positive for *Clostridium perfringens*. The patient had worsening abdominal distension in which an abdominal computed tomography scan uncovered a colonic mass, and further work-up revealed poorly differentiated adenocarcinoma. The patient was treated with antibiotics, but unfortunately, given his age and the new malignancy, he was discharged to hospice care. The association between clostridial bacteremia and colon cancer has been well described in the literature and is further discussed in this article. This case highlights the importance of recognizing possible occult malignancy in the right clinical setting in patients found to have clostridial bacteremia.

### ARTICLE HISTORY

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### KEYWORDS

*Clostridium perfringens*;  
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### 1. Background

Bacteremia due to *Clostridium perfringens* is associated with significant morbidity and mortality [1]. The clinical presentation of this infection is often non-specific, leading to considerable difficulty in diagnosis and delay in the initiation of appropriate therapy. Infection with this organism often presents in elderly patients with multiple comorbidities including gastrointestinal malignancies [2]. Hence, identification of *C. perfringens* bacteremia should alert the treating physician to the association with gastrointestinal malignancies necessitating further work-up.

### 2. Case presentation

We report the case of an 89-year-old man with a history of chronic lymphocytic leukemia (CLL) presenting to the emergency department with new-onset fevers and fatigue for the past month. His last treatment of rituximab for CLL was 2 years ago. A review of his systems was otherwise negative.

His vital signs on admission were notable for a temperature of 39.3°C; otherwise, he was hemodynamically stable. The physical examination was unremarkable with the exception of abdominal distension with splenomegaly. Relevant laboratory testing found lactate 0.9 mEq/l, white blood cell count 32.3 cells/μl (86% lymphocytes), and anemia and thrombocytopenia at baseline.

Blood cultures grew *C. perfringens* sensitive to clindamycin, metronidazole, and penicillin. Hematology–oncology were consulted owing to the history of CLL; they recommended against further treatment given his

leukopenia remaining at baseline and with an obvious source of infection explaining his symptoms. Appropriate antibiotics were selected and his fever subsided within 24 h. Repeat blood cultures were negative.

On hospital day 2, the patient's abdominal distension worsened, warranting an abdominal computed tomography scan which revealed a non-obstructing colonic mass in the sigmoid colon with possible perforation and surrounding abscess. A subsequent flexible sigmoidoscopy confirmed the location of the mass, and biopsy results identified a poorly differentiated adenocarcinoma.

The patient refused any further intervention and died peacefully at home 1 month later.

### 3. Discussion

*Clostridium perfringens* is a rod-shaped, Gram-positive, anaerobic, spore-forming ubiquitous bacterium that is part of the normal flora of the gastrointestinal tract [3]. This bacterium produces numerous extracellular toxins which are responsible for causing disease, the most important one being alpha toxin. Alpha toxin is a hemolytic toxin, which stimulates platelet aggregation and up-regulates adherence molecules of polymorphonuclear leukocytes, leading to a decline in blood flow and eventual necrosis [4].

The association between bacteremia and colon cancer has been well described in the literature, most commonly with *Streptococcus bovis*. The reported incidence of colonic neoplasms and *S. bovis* varies greatly, with one study claiming that

the association is, on average, close to 40% [5]. Much less reported, but equally important, is the relationship between cancer and clostridial bacteremia.

In a case series by Myers et al. [6], which evaluated patients who had positive *Clostridium* species in blood cultures, it was found that 28 of the 56 patients had an underlying malignancy, most commonly of gastrointestinal or hematological origin. In addition, 43 of the 56 patients had a gastrointestinal source.

*Clostridium perfringens* was also the most frequently isolated microorganism. There is insufficient literature linking specifically CLL, seen in our patient, to *C. perfringens* bacteremia. The associated hematological diseases in the study by Myers et al. include non-Hodgkin's lymphoma, Burkitt's lymphoma, Hodgkin's lymphoma, acute myelocytic leukemia, and acute lymphocytic leukemia [6].

The affiliation between malignancy and bacteremia varies greatly. Another retrospective case series reported 47.8% malignancy observed in patients with clostridial septicemia [7]. This association between *Clostridium* and colon cancer is thought to be due to direct inoculation and spread of normal gut flora owing to local destruction by cancer cells, and/or the hypoxic, acidic environment established by glycolysis of the tumor [8].

In summary, this case highlights the importance of considering occult malignancy, in particular gastrointestinal malignancy, in patients presenting with *C. perfringens* bacteremia. This provides an opportunity for possible early identification and initiation of treatment for the underlying malignancy.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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