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

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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 39.3ºC; 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 relation-
ship 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 fre-
quently isolated microorganism. There is insufficient
literature linking specifically CLL, seen in our patient,
to C. perfringens bacteremia. The associated hemato-
logical 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 gastro-
intestinal malignancy, in patients presenting with C.
perfringens bacteremia. This provides an opportunity
for possible early identification and initiation of treat-
ment for the underlying malignancy.

Disclosure statement
No potential conflict of interest was reported by the
authors.

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