

Bacteremia due to *Clostridioides difficile* (former *Clostridium difficile*) secondary to intestinal microperforation by foreign body: A Case Report

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Abstract

Bacteremia secondary to *Clostridioides difficile* (*C. difficile*) is a rare event, with less than 200 cases described in the literature. Due to this paucity of cases, here we describe a case of *C. difficile* bacteremia that was successfully treated with intravenous metronidazole. A 42-year-old African-American man presented with fever, abdominal pain and watery diarrhea. A preemptive diagnosis of abdominal sepsis was made and amoxicillin-clavulanate was prescribed. An abdominal ultrasound was equivocal, so a contrast-enhanced abdominal computed tomography scan was made and showed a duodenal microperforation due to a foreign body in the terminal ileum. After an initial failure of treatment, there was full clinical improvement with a change for intravenous cefepime and metronidazole on hospital day 3. Only on day 7 of hospital course, however, the blood cultures came back positive for *C. difficile*. Therefore, we can learn two lessons from this case: first, *C. difficile* bacteremia can occur after duodenal perforation and, second, intravenous metronidazole can be an effective treatment for *C. difficile* bacteremia.

Keywords

bacteremia; *clostridium difficile*; *clostridioides difficile*

Case Presentation

A 42-year-old, African-American man was evaluated for fever, abdominal pain and one episode of generalized seizure at the emergency department of this hospital. He lived with his parents and had a past medical history of Dravet syndrome, characterized by cognitive deficits and seizures that were well-controlled with valproic acid, risperidone, phenobarbital and clonazepam. Most of the interview relied on information given by the family due to the patient's severe cognitive deficits, including physical exam interpretation (e.g., facial mimics interpreted by the mom on abdominal palpation).

The patient presented to the emergency department with a 7-day history of fever, abdominal pain, inappetence and one tonic-clonic seizure. Prior to hospital arrival, his mother took him to an urgent care center where ciprofloxacin was prescribed for a supposed severe gastroenteritis, but did not improve his

symptoms. A review of systems at presentation was notable for four episodes of vomiting and two days of watery diarrhea, and was negative for dizziness, focal weakness and numbness, dyspnea, and dysuria. The mother denied any alcohol or substance abuse and reported that the seizure disorder was well-controlled until the past week.

On examination, the temperature was 39.8 °C, the heart rate was 150 beats per minute, the blood pressure 110/77 mmHg, the respiratory rate 24 breaths per minute, and the oxygen saturation 97% while the patient was breathing ambient air. The patient was restless and an abdominal examination was positive for distension, diffuse pain to palpation, and voluntary guarding, but without clear signs of peritonitis. The remainder of the examination, although limited by the cognitive deficits, appeared normal.

After the first history and physical exam, a diagnosis of abdominal sepsis was established and amoxicillin-clavulanate 1 g, IV, BID was started while waiting for further laboratory tests and for an abdominal ultrasound. Initial blood tests showed 10,086 leukocytes with a left shift of 11%, a hemoglobin of 12.8 g/dl, a C-reactive protein of 148,3 mg/L, a lactate of 1,26 mmol/L, and a normal kidney function. The chest x-ray was unravelling. Urinalysis was clear. An electrocardiogram showed only sinus tachycardia. The abdominal ultrasound was notable only for distension of bowel loops at the right lower quadrant that hindered accurate evaluation of the area, but without free fluid or any signs of perforation. Two sets of blood cultures were collected at this time, before starting the antibiotics.

Due to the equivocal abdominal ultrasound, a contrast-enhanced abdominal CT scan was performed on day 2. It revealed a 4.2 cm-long foreign body inside the terminal ileum (likely a toothpick or a bone) with adjacent bowel wall stranding and a small amount of free fluid, but no signs of perforation at this site. In addition, it showed a left renal vein thrombus with a gas bubble inside and indefinite lower margins that could be related to a previous duodenal perforation near this location. At this moment, general surgery was consulted and oriented conservative care with antibiotics, analgesia and electrolyte replacement, without a need for emergent surgery due to apparently blocked perforation in the duodenum.

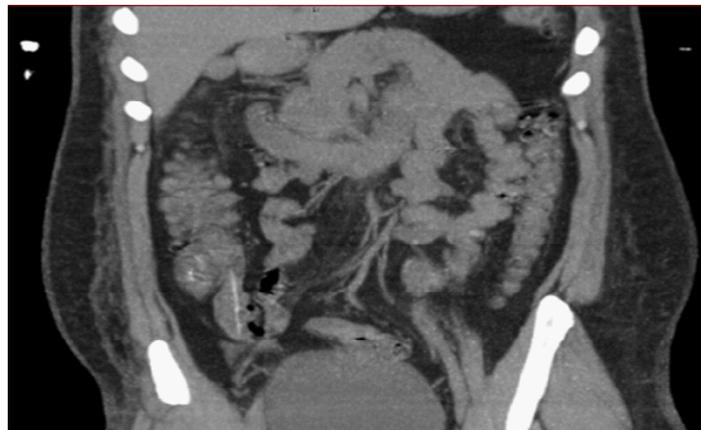


Figure 1: Coronal section of a computed tomography scan of the abdomen showing a foreign body in the terminal ileum, but without signs of intestinal perforation.

On hospital day 3, the patient remained febrile and repeat laboratory tests showed no improvement of inflammatory markers. The failure of improvement combined with recent use of ciprofloxacin prompted us to extend antimicrobial coverage by changing the antibiotic regimen for cefepime 2g, IV, TID and metronidazole 500 mg, IV, BID. The following day, the patient improved substantially, accepting oral diet and becoming afebrile. On day 6, the patient continued improving and the laboratory tests showed a normal cell blood count and a C-reactive protein of 41.9 mg/L. On day 7, the patient was already feeling in his baseline according to his mother and the blood cultures returned positive for *Clostridioides difficile* by the method of Matrix-Assisted Laser Desorption-Ionization - Time of Flight (MALDI-TOF Method). The test was repeated twice to confirm the result. Due to this result, we discussed the case with the local Hospital Infection Control Committee regarding the necessity of adding IV vancomycin, but decided not to after a literature review of scarce case reports showed no clear benefits and due to the patient's obvious clinical improvement. Review of the chart at this time for *C. difficile* fecal toxin at day 1 showed a negative result.

On the following days, the patient continued to improve and a repeat CT scan was performed on day 10, one day after finishing cefepime and metronidazole, showing progression of the foreign body into the cecum and no signs of perforation. During the hospital stay, there were no seizures, with the initial one being attributed to sepsis. On day 13, after complete clinical improvement, the patient was discharged for continued ambulatory care. Unfortunately, continued care was lost and the patient did not return to his scheduled appointments, and attempts to contact his family were fruitless.

Discussion

Clostridioides difficile, a gram-positive, anaerobic, spore-forming bacillus that was first described in 1935 by Hall & O'Toole, received its name due to the peculiarities and difficulties of isolating it [1]. It is now known as the most common cause of antibiotic-associated diarrhea and overall health care-associated infections in the United States [2]. Although there is evidence of mortality improvement in patients with *C. difficile*, the infection's incidence is still rising [3].

Bacteremia secondary to *C. difficile*, on the other hand, is a rare event, with an overall annual incidence of 1.8 per 100,000 population [4]. In most recent guidelines and treatment reviews, *C. difficile* bacteremia existence and treatment protocol is not even mentioned [5,6]. Thus, the ideal diagnostic test and treatment for *C. difficile* bacteremia still remain elusive, which is even more worrisome due to its mortality rate of 30% to 35% [7,8].

Classically, the diagnosis of *C. difficile* colitis is made through fecal testing for toxins, but they are not always positive in patients with *C. difficile* bacteremia and thus raise another question on the ideal method for bacteremia diagnosis. In our case, fecal toxins were negative and the diagnosis was made with the MALDI-TOF method. MALDI-TOF is a new test that relies on a spectra database to identify bacteria based on their size. MALDI-TOF has a sensitivity of at least 94% and a specificity close to 100% for *C. Difficile*, and can thus be used as a rapid and accurate diagnostic tool [9,10].

Our patient had two of the major risk factors for *C. difficile* bacteremia identified by Doufair M et al. review [7]: gastro-intestinal disruption and recent exposure to ciprofloxacin. Despite the uncertainties regarding treatment of choice and treatment duration, our option of combined intravenous cefepime and metronidazole for 7 days proved itself successful. Due to the bacteria historical susceptibility, intravenous metronidazole alone would probably suffice, but we cannot affirm it with certainty because several reports showed metronidazole failure [7]. Intravenous vancomycin seems like an obvious option in this setting, but we decided against its addition because the patient had already improved substantially with the current treatment.

In conclusion, *C. difficile* bacteremia still requires extensive research because there are less than 200 cases described in the literature. Current diagnostic methods should be regulated, and MALDI-TOF appears to be an accurate method. Furthermore, treatment guidelines for *C. difficile* should start to encompass *C. difficile* bacteremia in addition to *C. difficile* colitis due to its high mortality rate and absence of standardized treatment. Finally, we hope to add more information on this still fairly unknown condition so more patients can be recognized to suffer from this condition and then be accurately treated.

Conclusion

C. difficile bacteremia is still an unresearched area of study and therefore we add the report of a case successfully treated with intravenous metronidazole. This case illustrates two common dilemmas in the medical field: first, a common pathogen presenting in an uncommon way and, second, the hardships of making an accurate diagnosis of such infrequent disease's presentations. Hopefully, MALDI-TOF widespread use may improve *C. difficile* diagnosis accuracy and, with a more accurate diagnosis, more data will be released regarding this pathogen and protocol will be made to guide the treatment.

References

1. Hall IC, O'Toole E. Intestinal Flora in new-born infants: with a description of a new pathogenic anaerobe, bacillus difficilis. *Am J Dis Child.* 1935; 49: 390–402.
2. Lessa FC et al. Burden of Clostridium difficile infection in the United States. *N Engl J Med.* 372: 825, 2015.
3. Reveles KR, Lee GC, Boyd NK, Frei CR. The rise in Clostridium difficile infection incidence among hospitalized adults in the United States: 2001-2010. *Am J Infect Control* 2014; 42: 1028.
4. Leal J, Gregson DB, Ross T, Church DL, Laupland KB. Epidemiology of clostridium species bacteremia in calgary, Canada, 2000–2006. *J Infect.* 2008; 57: 198–203.
5. McDonald LC, et al. Clinical practice guidelines for Clostridium difficile infection in adults and children: 2017 update by the Infections Diseases Society of America (IDSA) and the Society for Healthcare Epidemiology of America (SHEA). *Clinical Infectious Diseases.* 2018; 66: 1-48.
6. Bagdasarian N, Rao K, Malani PN. Diagnosis and Treatment of Clostridium difficile in Adults: A Systematic Review. *JAMA.* 2015; 313: 398–408.
7. Doufair M, Eckert C, Drieux L, et al. Clostridium difficile bacteremia: Report of two cases in French hospitals and comprehensive review of the literature. *ID Cases.* 2017; 8: 54–62.
8. Daruwala C, Mercogliano G, Newman G, Ingerman MJ. Bacteremia due to clostridium difficile: case report and review of the literature. *Clin Med Case Rep.* 2009; 2: 5–9.

9. Coltella, L., Mancinelli, L., Onori, M. et al. Advancement in the routine identification of anaerobic bacteria by MALDI-TOF mass spectrometry. *Eur J Clin Microbiol Infect Dis*. 2013; 32: 1183.

10. Rémi Le Guern, Stéphanie Herwegh, Bruno Grandbastien, René Courcol, Frédéric Wallet. Evaluation of a New Molecular Test, the BD Max Cdiff, for Detection of Toxigenic *Clostridium difficile* in Fecal Samples. *Journal of Clinical Microbiology*. 2012; 50: 3089-3090.

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