

Clostridium Difficile Septicemia following Head and Neck Surgery- A Case Report

S Kadakia, P Kaushik, T Landrum, M Nagorski

Citation

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Abstract

Clostridium

difficile can cause a number of pathologies in the human body including colitis, deep-seated abscesses, arthritis, osteomyelitis, and blood-stream infections. (3). Of the aforementioned complications of C difficile infection, bacteremia is a rare complication of C difficile infection, and typically occurs in patients following colon surgery or those with underlying gastrointestinal disease. The literature has recorded multiple patients with C difficile bacteremia; however, most of them had either underlying gastrointestinal disease or colonic manipulation with the exception of one case (3). Here we present a patient with C difficile bacteremia following resection of laryngeal squamous cell carcinoma. Our patient initially did not have any evidence of bowel pathology or history of gastrointestinal surgery, however was later found to have C difficile bacteremia. None of the previously reported cases of C difficile bacteremia had an associated history of head and neck cancer surgery.

INTRODUCTION

C difficile is a gram-positive spore forming bacterium that has shown to be the causative agent behind pseudomembranous colitis. Pseudomembranous colitis is a colonic inflammatory condition that occurs after the prolonged usage of antibiotics such as amoxicillin. Usually the presence of normal gut flora prevents the overgrowth of C difficile due to space and nutritional competition. However, following the administration of certain antibiotics, the normal flora of the gut is exterminated allowing the unopposed proliferation of C difficile. As the bacteria proliferate they enumerate two types of exotoxins (1). The first exotoxin is a cytotoxin that disrupts the actin cytoskeleton, leading to cell death. The second toxin is a chemoattractant for neutrophils. The combination of these two toxins causes significant inflammation in the colon as demonstrated by the presence of fecal leukocytes in the stools of affected patients. Despite the fact that C difficile does not cause invasive colitis, it is interesting to note that it produces fecal leukocytes similar to those seen in cases of entero-invasive diarrheal illnesses.

Aside from colitis, the C difficile bacterium has also been linked to numerous extra-colonic pathologies such as abscesses, arthritis, pyelonephritis, and osteomyelitis (3, 4).

These complications are indeed rare, but possess a poor prognosis when present (5). Another rare complication is C difficile bacteremia. C difficile bacteremia, when described in the literature, is typically associated with gastrointestinal disease or occurs following colon surgery. In patients with gastrointestinal disease, the colonic wall is more apt to allow bacteria into the blood supply (2). Patients with pseudomembranous colitis are more likely to develop either a poly or monomicrobial infection of the blood stream involving C difficile.

This case report examines the occurrence of C.difficile bacteremia in a patient following head and neck surgery, with no underlying gastrointestinal pathology initially, although retrospectively she was found to have evidence of colitis on imaging.

CASE PRESENTATION

A 57-year-old Caucasian female patient presented to our hospital with a lump in her throat. Tonsillectomy was performed one-month later, pathology of which showed squamous cell carcinoma. A modified radical neck dissection was done after one month. Four months later, the patient began complaining of itchiness in her throat along with an 18 kg weight loss. She was found to have a lesion in

her throat, biopsy of which showed recurrence of cancer. A subsequent partial glossectomy and jejunostomy tube placement followed.

The postoperative course was complicated by the development of nosocomial pneumonia and adult acute respiratory distress syndrome (ARDS). Sputum and blood cultures grew methicillin resistant *Staphylococcus aureus* (MRSA). She continued to be febrile and subsequent blood cultures grew *C difficile*. She developed septic shock due to pneumonia and blood-stream infections and required pressor support. No diarrhea was reported at this time.

A computed tomography (CT) scan of the abdomen was done to look for the source of *C difficile* bacteremia and she was found to have radiologic evidence of colitis. The patient was started on IV metronidazole and IV linezolid to cover for *C difficile* and MRSA blood stream infections.

Her hospital course was further complicated by thrombosis of the right ulnar artery following placement of an arterial line. A thrombectomy was performed and she was placed on intravenous heparin. Subsequently she developed bilateral pleural effusions and another episode of septic shock with increasing pressor requirement. Daptomycin and colistin were added for possible multi-drug resistant bacterial infections. Subsequent blood cultures remained negative and patient improved with ventilatory support, fluid resuscitation and timely antibiotic management.

DISCUSSION

Clostridium difficile is the most common cause of nosocomial diarrhea in the hospital setting. Although *C difficile* typically causes a toxin-mediated diarrhea, the literature has described a number of extra-intestinal manifestations that have been shown to be unrelated to toxin production (6). Some of those manifestations can include pyelonephritis, osteomyelitis, abscesses, and others.

Interestingly, while *C difficile* colitis is usually associated with some form of antibiotic exposure in the 6 weeks preceding the condition, the extra-intestinal manifestations of *C difficile* do not appear to have the same antibiotic related association. Moreover, while the colitis is seen more commonly in adults, the extra-intestinal manifestations have been characterized in children as well (7-8). Garcia et al. describes a case of a 2-year-old child who was found to have an intra-abdominal abscess caused by *C difficile*. Although most patients with extra-intestinal manifestations of *C difficile* have either a preceding colitis or abdominal surgery,

there are a few patients who do not have these apparent risk factors (6). *C difficile* when isolated from its extra-colonic manifestations is often found to be part of polymicrobial flora.

Unlike *C difficile* associated colitis, bacterial toxins do not have a major role in the pathogenesis of extra-colonic manifestation including blood-stream infections caused by *C difficile*. These extra-colonic manifestations are characterized by direct bacterial invasion rather than extravasation of the toxins. Also, patients who were bacteremic did not always have colitis or antibiotic therapy prior to admission. *Clostridium difficile* bacteria are native flora of the gastrointestinal tract. When there is bowel manipulation or underlying bowel pathology, the colon can become porous, allowing the translocation of bacteria into the blood stream and other adjacent structures (2). This is further corroborated by the fact that bacteremia with *C difficile* is rarely monomicrobial; on the contrary, it is polymicrobial and is similar to the composition of the human gastrointestinal tract (3,9,10). When multiple organisms are isolated, *C difficile* has been shown to increase the virulence of other bacteria (11).

The therapy for *C difficile* bacteremia remains controversial. Because most cases of bacteremia have been polymicrobial including *C difficile*, the therapy has been targeted to cover multiple bacteria (3, 7). The treatment for monomicrobial *C difficile* bacteremia, which may vary by institution, largely relies on intravenous metronidazole or vancomycin (2).

CONCLUSION

This case reported the occurrence of *C difficile* septicemia following a glossectomy and radical neck dissection in a patient diagnosed with recurrent laryngeal carcinoma. The literature has cited cases of *C difficile* bacteremia following colonic manipulation and in patients with underlying gastrointestinal pathology, but has not described this phenomena following head and neck surgery. While head and neck surgery may not be a risk factor for *C difficile* bacteremia, it raises the question of where the bacteremia stems from and what the inciting factors may be in their spread. An additional study of the virulence factors in bacteremia and extra-colonic manifestations would be of use for the investigation of future cases.

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Author Information

Sameep Kadakia, B.S.

Drexel University College of Medicine

Parul Kaushik, M.D., M.P.H

Drexel University College of Medicine

Tre Landrum, D.O.

Drexel University College of Medicine

Matthew Nagorski, M.D.

Drexel University College of Medicine