Empyema caused by *Clostridium difficile*

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Extraintestinal infections of *Clostridium difficile* are rare and often associated with underlying disorders. A case of empyema caused by aspiration of *C difficile* in a patient with carcinoid syndrome and *C difficile* colitis is described.

Key Words: Clostridium difficile*, Empyema, Extraintestinal manifestations*

Empyème causé par Clostridium difficile

RÉSUMÉ : Les infections extra-intestinales causées par Clostridium difficile sont rares et souvent associées à d'autres maladies sous-jacentes. On décrit ici un cas d'empyème causé par l'aspiration de C. difficile chez un patient atteint d'un syndrome carcinoïde d'une colite à C. difficile.

Extraintestinal infection with *Clostridium difficile* is a rare condition and is usually associated with concurrent diseases. We report a case of community-acquired *C difficile* empyema believed to have arisen from an aspiration pneumonia.

CASE PRESENTATION

A 65-year-old man with a past history of carcinoid syndrome and resected liver metastases six months earlier that was complicated by *C difficile* enteritis presented with a history of increasing dyspnea. His enteritis had been treated with a seven-day course of metronidazole and oral vancomycin. Three weeks before admission, he had developed a productive cough, fever, increasing dyspnea and right-sided chest ache. He had had diarrhea, which was believed to be due to carcinoid syndrome, since his surgery. He frequently aspirated thin liquids and would often wake-up in the night choking. On examination, he was in respiratory distress with a temperature of 39.1°C but had stable blood pressure. Head, neck and cardiac examination were unremarkable. Respiratory examination revealed dullness to percussion and decreased breath sounds on the right side. Abdominal examination was unremarkable with a recent operative scar, normal bowel sounds, no tenderness and no peritoneal findings. He had a white blood cell count of 9.9×10^9/L, and the rest of his results were unremarkable. While in the emergency department, he rapidly developed respiratory failure requiring intubation and mechanical ventilation. Chest x-ray revealed a right-sided pleural effusion with atelectasis in the right middle and lower lobe. Using standard sterile technique and under controlled conditions, a chest tube was placed, which drained pleural fluid with a pH of 6.94, normal lactase dehydrogenase and protein. Empirical treatment with ceftriaxone and intravenous clindamycin was started. Cultures of the chest tube fluid grew scant amounts of *C difficile* with no other isolates, and the patient was switched to cefazolin 2 g every 6 h and metronidazole 500 mg every 8 h. All other cultures of blood, sputum and urine were negative. Pleural fluid, obtained via thoracentesis 10 days later, had a pH of 7.08 and lactase dehydrogenase of 2290 IU, and grew moderate amounts of *C difficile*. Both cultures of *C difficile* were toxin positive. No bowel investigations

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including sigmoidoscopy were performed. Culture of the oral cavity and sputum, and a stool toxin assay were all negative for *C difficile*. The patient was switched to oral metronidazole to complete a total of four weeks of therapy.

DISCUSSION

C difficile was first identified in 1935, but up until the 1960s it was thought to be only a commensal organism in neonatal colons. During the 1960s and 1970s, pseudomembranous colitis associated with antibiotic use became a serious problem. Originally thought to be caused by *Staphylococcus aureus*, it was not until 1977 that *C difficile* was found to be the etiological pathogen. Despite rapid progress in understanding the pathogenesis and epidemiology of the disease, *C difficile* colitis remains a common problem. It is estimated that 21% of hospitalized patients become colonized with *C difficile* during their hospital stay (1). Large hospital outbreaks are not uncommon and are often difficult to control. Although colitis is the most common manifestation, recently there have been reports of extraintestinal infections with *C difficile*.

In a review of 17 patients with extraintestinal *C difficile* infections, Feldman et al (2) found that most isolates from sites outside the gastrointestinal tract were reported in the blood, followed by peritoneal fluid. Only two cases were due to pleural fluid infection (3). Another case series by Baudouin et al (4) reported three additional cases of *C difficile* bacteremia. Marina et al (5) reported the bacteriology of anaerobic pleuropulmonary infections and found that, of 116 organisms isolated, only two were *C difficile* and only one of these was a pure culture. *Clostridium perfringens* is more likely to infect the pleural space (6).

One other case report of *C difficile* empyema has been published (7). In that case, the proposed mechanism of infection was via an infected chest tube into a pre-existing empyema. No stool samples were sent for culture of *C difficile*. In our case, the patient presented to hospital with an empyema, with *C difficile* being isolated from fluid from the first chest procedure and then from a subsequent thoracentesis. He was known to have had *C difficile* colitis six months before and was treated with a seven-day course of metronidazole and oral vancomycin. He had persistent diarrhea that was thought to be due to the carcinoid syndrome because he was not taking his octreotide. We surmise that his skin and/or oral cavity was colonized with *C difficile*. With a history of aspiration, he then developed a *C difficile* aspiration pneumonia and empyema. *C difficile* can colonize the orophyarnx in hospitalized patients even though it is not part of the normal oral flora (6). Contamination appears unlikely because the first pleural fluid withdrawn from the chest tube and a second sample obtained by thoracentesis both showed pure cultures of *C difficile*. The only other mechanism through which the fluid could be contaminated is hematogenous spread but in a review by Feldman et al (2), no cases of *C difficile* bacteremia resulted in pneumonia or empyema.

CONCLUSIONS

We report a rare case of *C difficile* empyema likely secondary to aspiration. This case should serve as a reminder to practice good isolation techniques with hand-washing in all patients, especially if toxin positive. This isolation should not be limited to enteric precautions alone because other body surfaces such as skin can be contaminated.

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