DOI: http://doi.org/10.4038/jmj.v34i2.170

Case Report

Successful management of clostridium difficile colitis with antegrade Vancomycin through a mucous fistula eliminating the need for subtotal colectomy.

[1]Joseph SA, [1]Kamal Jayasuriya
[1]District general Hospital Chilaw.

Abstract

Clostridium difficile (CD) is the most common cause of healthcare-associated infections and can have devastating morbidity and mortality. A 40-year-old diabetic patient who was recently treated for wound sepsis, subsequently developed CD colitis. This patient failed the standard medical therapy for CD colitis, decompensated and required surgical exploration, partial colectomy and mucous fistula creation. Following surgery, her clinical condition improved and her colitis resolved with the antegrade administration of vancomycin through mucous fistula. Traditional treatment algorithms involve oral metronidazole or vancomycin. Our case study report describes the index case of topical vancomycin through a mucous fistula may have reduced the need for total colectomy in the treatment of fulminant CD colitis.

Introduction

Clostridium difficile (CD) infection accounts for up to 20% of all antibiotic associated diarrheas. Effective treatment of Clostridium difficile infection that does not respond to standard first-line therapy is of vital importance to current clinical practice. Currently, treatment with orally administered metronidazole, vancomycin and fidaxomicin are regarded as the standard therapeutic option for CD colitis. (2,6) Successful treatment of severe CD colitis has been reported with the use of adjunctive intracolonic vancomycin therapy. (1,2,7) We present a case of fulminant CD colitis following treatment for chronic diabetic foot ulcers ultimately requiring an exploratory laparotomy and segmental colectomy. Following surgery, the patient was successfully treated with antegrade vancomycin administered through the mucus fistula.

Case report

A 40-year-old woman with past history of diabetes mellitus for 9 years with neuropathic foot ulcers and Charcot's arthropathy was admitted to the hospital two weeks before and treated for foot wound sepsis, discharged with oral clindamycin. She presented again with fever, diarrhea and abdominal pain for 5days with shortness of breath and reduced urine output for one day. On examination she was pale, dyspnoeic and tachypnoeic. Her blood pressure was 90/70mmHg and pulse rate was 120/min. She had generalized abdominal distention, tenderness, guarding and rigidity.

Blood tests showed white cell count of $33 \times 10^3/mm^3$ and CRP 153µg/ml. Her serum creatinine was 4.1mg/dL, but her liver functions, liver enzymes and serum bilirubin were in the normal range. Ultrasonography of the abdomen showed moderate ascites, thickened bowel wall in ascending, transverse and descending colon with normal small bowel loops and reduced peristalsis.

She was resuscitated and treated with oral Vancomycin and IV Metronidazole with concomitant acute kidney injury requiring initiation of hemodialysis. Stool for Clostridium difficile toxin A & B tests were positive. Abdominal CT scan demonstrated diffuse wall thickening in the Caecum and whole length of colon and this thickening was more on right side of the colon but the rectum was normal. There was hyperenhancement in the mucosa with submucosal edema and thickened haustral folds (Figure1). Her imaging studies supported the diagnosis of pseudomembranous colitis with the toxic megacolon on right side without any bowel perforation or gangrene.

Corresponding Author: S A Joseph, Email: salbertjosf@gmail.com https://orcid.org/0000-0003-2651-7414 Submitted June 2022, Accepted November 2022

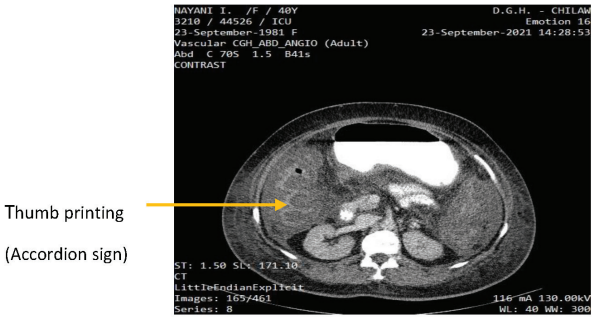

Figure1: CT imaging shows accordion sign which is highly suggestive of pseudomembranous colitis; it consists of mucosal edema and inflammation of large bowel.

After ten days and despite double therapy, her disease progressed to fulminant CD colitis, her leukocytosis had progressed to 52 × 10^3/mm^3 and she required multiple vasoactive medications to sustain a mean arterial pressure greater than 65 mmHg. Her renal function was not improved despite of regular hemodialysis.

The decision was made to proceed to the operating room for laparotomy. During laparotomy, the right colon appeared edematous and dilated with evidence of significant inflammation (toxic megacolon - Figure2) with a transition point to healthy appearing colon distal to the hepatic flexure. Similarly, the small bowel appeared healthy proximal to the ileocecal valve. The caecum, ascending colon, proximal part of the transverse colon and small bowel extending 10 cm proximal to the ileocecal valve were resected. The terminal ileum and transverse colon stumps were externalized.

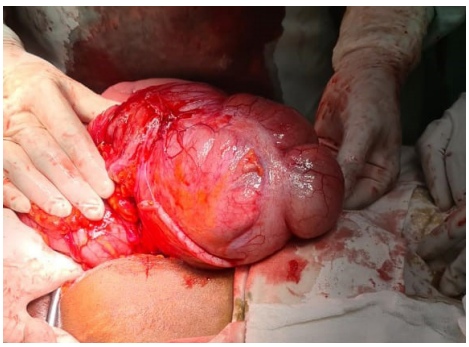

Figure 2: Caecum and ascending colon were edematous and dilated with significant inflammation (Toxic megacolon).

Pathological analysis of the resected colon confirmed our clinical suspicion, identifying acute enterocolitis with transmural inflammation and luminal pseudo-membrane formation (Figure3). Following the operation, the mucus fistula developed new pseudo membranes consistent with persistent colitis. Over ten days, dissolved vancomycin (250 mg four times daily) was administered through the mucous fistula by a rubber catheter in an antegrade fashion in addition to IV metronidazole. During this course of vancomycin, the clinical burden of pseudomembranous disease on the mucous fistula diminished, hemodynamic lability improved, and the leukocytosis cleared.

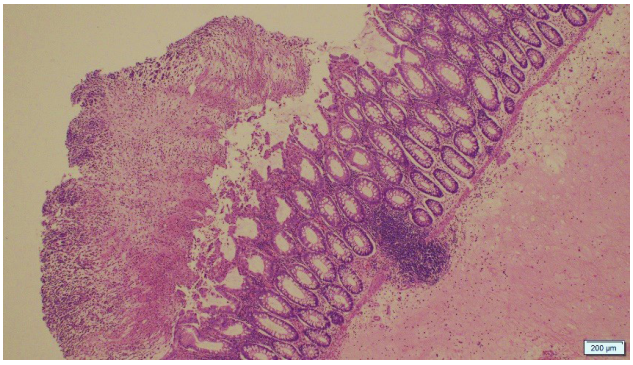

Figure 3: Microscopic image of the resected colon shows denuded epithelium and mucopurulent exudate erupts out of the crypts.

Discussion

Clostridium difficile (CD) a spore-forming, anaerobic, gram-positive bacillus, is the most common cause of nosocomial diarrhea in adults. According to the national antibiotic guidelines of Sri Lanka, CD infection is treated with oral metronidazole as a primary therapy for non-fulminant colitis. If it is not responding, fulminant disease or relapsing, oral vancomycin can be added or used as an alternative therapy. If the oral vancomycin is not available intravenous vancomycin preparation may be given orally. With the high incidence and increased severity of the disease, the literature has proposed new agents and strategies for managing CD infections that have failed to improve recommended treatment regimen.

Accordance with 2021 Infectious Diseases Society of America (IDSA) guidelines for patients with an

initial episode of fulminant CD infection, appropriate treatment regimens include either oral vancomycin or oral fidaxomicin; they favor fidaxomicin over vancomycin given a small benefit with respect to recurrence rates (2).

Metronidazole is an alternative but less effective agent for treatment of fulminant CD infection if oral vancomycin and oral fidaxomicin are not available; however, it should be avoided in patients who are frail, age >65 years, or who develop CD infection in association with inflammatory bowel disease. Intravenous vancomycin is not effective for treatment of CD infection since the drug is not excreted appreciably into the colon during short-term systemic administration (2,7).

Use of metronidazole has been associated with higher rates of treatment failure in observational and retrospective studies. The reasons for metronidazole failure are poorly understood. One factor may be that stool drug levels in patients taking oral metronidazole (which is well absorbed) decrease as colonic inflammation subsides, whereas stool drug levels in patients taking oral vancomycin or fidaxomicin (which are poorly absorbed or not absorbed) remain high throughout the course of therapy (2).

Additional considerations include addition of vancomycin administered retrograde rectally via enema or antegrade via loop colostomy or mucous fistula. However, these interventions are associated with risk of colonic perforation; therefore, they should be restricted to patients who are unresponsive to standard therapy and the procedure should be performed by personnel with appropriate expertise (1,4,7).

The optimal dosing of rectal vancomycin has not been established by clinical trials, and case descriptions vary widely. It is often given as a retention enema (500 mg in 100 mL of normal saline; retained for as long as possible and readministered every six hours). Furthermore, multiple case reports have demonstrated successful medical management of fulminant CD colitis with crushed oral preparation of vancomycin through rectally or via colostomy (2).

Timely surgical management improves outcomes in CD colitis. Since CD colitis is a toxin mediated disease, postoperative antibiotics are usually recommended even in the cases of subtotal colectomy which should provide mechanical source control. Given the morbidity of a subtotal colectomy, there has recently been a push towards bowel sparing treatment regimens, most notably being loop ileostomy with intraoperative colonic lavage and 10 days of vancomycin antegrade washes (3,4).

Conclusion

In this case, our patient failed to improve with oral vancomycin and IV metronidazole alone, prompting the addition of oral fidaxomicin as a third agent for CD treatment but fidaxomicin was not available in state or private sector. This case report demonstrates a new administration route for vancomycin through mucous fistula that may prove effective in curing fulminant CD colitis obviating the need for subtotal colectomy.

References

1. Anucha Apisarnthanarak, Behzad Razavi, and Linda M. Mundy: Adjunctive intracolonic vancomycin for severe Clostridium difficile colitis: Case series and review of the literature. Clinical infectious diseases 2002; 35:690–6

2. Clostridioides difficile infection in adults: treatment and prevention; uptodate.com

3. Ben Kautza and Brian S. Zuckerbraun; The Surgical Management of Complicated Clostridium Difficile Infection: Alternatives to Colectomy; SURGICAL INFECTIONS Volume 17, Number 3, 2016 337-342.

4. Suzanne Arnott, Matthew Skancke, Sheena Chen, Bruce Abell: A case report of successful management of clostridium difficile colitis with antegrade Fidaxomicin through a mucous fistula obviating the need for subtotal

colectomy: International Journal of Surgery Case Reports 42 (2018) 79–81

5. F.C. Lessa, C.V. Gould, L.C. McDonald: Current status of Clostridium difficile infection epidemiology, Clin. Infect. Dis. 55 (Suppl 2) (2012) S65–70. http://dx.doi.org/10.1093/cid/cis319.

6. R.L. Nelson, K.J. Suda, C.T. Evans, Antibiotic treatment for Clostridium difficile-associated diarrhoea in adults, Cochrane Database Syst. Rev. 3 (2017). http://dx.doi.org/10.1002/14651858.

7. Edie P. Shen, Christina M. Surawicz; Current Treatment Options for Severe Clostridium difficile–associated Disease: Gastroenterology & Hepatology Volume 4, Issue 2 February 2008; 134- 139.

8. G.M. van der Wilden, M.P. Subramanian, Y. Chang, et al., Antibiotic regimen after a total abdominal colectomy with ileostomy for fulminant clostridium difficile colitis: a multi-Institutional study, Surg. Infect. (Larchmt) 16 (4) (2015) 455–460, http://dx.doi.org/10.1089/sur.2013.153.