



■ Clinical case

Successful colonoscopic fecal transplant for severe acute *Clostridium difficile* pseudomembranous colitis

Gallegos-Orozco JF,¹ Paskvan-Gawryletz CD,² Gurudu SR,¹ Orenstein R.³

- 1 Divisions of Gastroenterology. Mayo Clinic in Arizona. United States of America.
- 2 Midwestern University, Arizona College of Osteopathic Medicine. United States of America.
- 3 Infectious Diseases. Mayo Clinic in Arizona. United States of America.

Received December 5th, 2011; accepted January 10th, 2012.

■ Abstract

Clostridium difficile-associated diarrhea has become one of the most common healthcare-associated infections, with significant morbidity and mortality, especially among the elderly in the inpatient setting. The standard approach with metronidazole and vancomycin is not very effective in treating patients with severe colitis and hence other alternatives have been explored. We herein describe the first successful experience of colonoscopic fecal transplant in a case of severe refractory *C. difficile* pseudomembranous colitis.

Keywords:

Fecal bacteriotherapy, fecal replacement therapy, infectious colitis, *Clostridium difficile*-associated diarrhea, USA.

■ Resumen

La diarrea por *Clostridium difficile* se ha convertido en una de las infecciones nosocomiales más frecuentes, lo que conlleva un incremento significativo en la morbi-mortalidad de estos pacientes, especialmente entre la población de pacientes hospitalizados y en adultos mayores. El tratamiento médico habitual con metronidazol y vancomicina, resulta poco eficaz en el manejo de enfermos con colitis pseudomembranosa grave, por ello se han buscado otras alternativas terapéuticas. Aquí describimos, la primera experiencia exitosa de bacterioterapia fecal por vía colonoscópica, en un paciente con colitis pseudomembranosa grave, por *Clostridium difficile* resistente a tratamiento médico.

Palabras clave:

Bacterioterapia fecal, terapia de reemplazo fecal, colitis infecciosa, diarrea asociada a *Clostridium difficile*, EUA.

Correspondence author: Juan F. Gallegos-Orozco, M.D. Assistant Professor of Medicine, Mayo College of Medicine. Division of Hepatology, Mayo Clinic in Arizona 5777 E Mayo Blvd., Phoenix, AZ. Z.P. 85054. Telephone: 480 342 1010. E-mail: gallegos.juan@mayo.edu

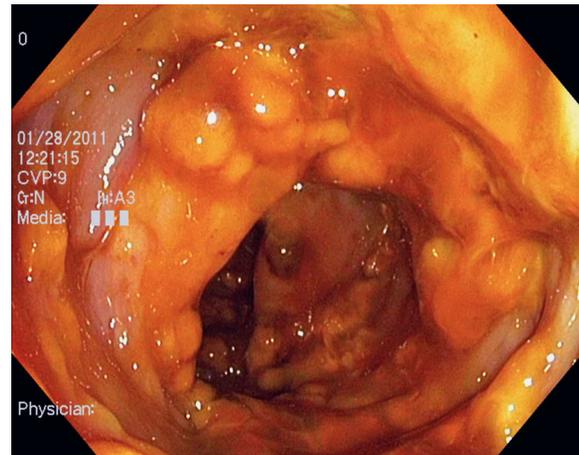
■ Introduction

Clostridium difficile colitis has become one of the most common healthcare-associated infections and a significant contributor to morbidity and mortality, especially among elderly hospitalized patients. We describe our successful experience with colonoscopic fecal transplant in a case of severe refractory *C. difficile* pseudomembranous colitis.

■ Case presentation

A 71-year-old man with peripheral vascular disease developed severe diarrhea after receiving several antimicrobials for a femoral popliteal graft surgical site infection. He was admitted with profuse watery diarrhea, dehydration, leukocytosis, acute kidney injury, hypoalbuminemia and diffuse colonic wall thickening on CT scan. *Clostridium difficile* toxin assay by PCR using the commercially available Xpert®, *C. difficile* assay by Cepheid® (Sunnyvale, CA), which detects three targets: toxin B, binary toxin and the *tcdC* deletion, was positive. Oral metronidazole (500 mg every six hours) was commenced. Due to lack of clinical improvement 48 hours later the treatment was switched to oral vancomycin (125 mg every six hours) combined with parenteral metronidazole (500 mg IV every eight hours). In spite of this regimen his stool output remained greater than 1,000 mL/day. Flexible sigmoidoscopy on hospital day 8, showed severe pseudomembranous colitis and the oral vancomycin dose was increased to 500 mg every six hours. After three days at this dose he continued having profuse diarrhea and was given 400 mg/Kg IV immune globulin (IVIG) and IV tigecycline thereafter. The diarrhea and abdominal pain continued uninterrupted for the next week despite continuation of high dose oral vancomycin, IV metronidazole and IV tigecycline. The patient was advised that if his colitis failed to improve he would require a total colectomy. Due to the patient's reluctance to undergo a surgical procedure, colonoscopy with fecal transplantation was offered as a potential colon-sparing intervention. The patient opted for this procedure, with his brother serving as the healthy stool donor. The donor was screened for viral hepatitis A, B and C, as well as for HIV; and a stool sample was tested for *C. difficile* toxin, enteric bacterial pathogens, *Giardia*, and

■ **Figure 1.** Colonoscopic image revealing the typical findings of pseudomembranous colitis at the time of fecal bacteriotherapy.



routine parasitology, all of which were negative. With the patient's consent, all the antimicrobials were stopped the night prior to fecal replacement therapy. Colonoscopy on hospital day 18 revealed persistence of pseudomembranous colitis from the rectum to the distal transverse colon (**Figure 1**). Fresh donor stool was homogenized in 400 mL of normal saline and was administered endoscopically throughout the colon. On day three post-fecal replacement, the patient's diarrhea and abdominal pain resolved and he was dismissed following a 24-day hospitalization and remains clinically well at 30 days post-discharge with normal bowel movements.

■ Discussion

Fecal replacement therapy, also known as fecal bacteriotherapy or fecal transplantation, has been increasingly used for the management of recurrent *C. difficile* infection with numerous case series reporting successful outcomes in 73% to 100% of cases.¹⁻⁶ Fecal replacement has variably been accomplished via nasogastric tube infusion, retention enemas, duodenoscopic and colonoscopic infusion. The management of severe refractory *C. difficile* infection remains problematic and despite recent guidelines there is little evidence to support management recommendations. Most patients receive high doses of oral vancomycin and IV metronidazole. Prior reports suggest benefit to IVIG⁷

and IV tigecycline.⁸ All of these were tried unsuccessfully in our patient. To our knowledge, this is only the second case report of successful fecal bacteriotherapy in the setting of severe, refractory *C. difficile* colitis, and the first one to use a colonoscopic approach to fecal implantation in this setting. In the first report, the patient had fulminant *C. difficile* colitis that resolved after donor stool retention enema.⁹ Our patient, like many others with this disease, was desperate for a non-operative solution after over two weeks of hospitalization and ineffective treatments. The striking response after discontinuing all therapy for *C. difficile* and providing the brother's fecal flora suggests this may be an alternative treatment for severe and refractory disease as well as recurrent disease. Although we cannot be certain that his improvement wasn't a cumulative impact of all the previous treatments, the dramatic clinical response after stopping all *C. difficile* therapies suggests that it was the fecal replacement that provided the cure. Risks of colonoscopy should be considered while deciding the route of fecal replacement therapy, particularly in patients with severe colitis. Our findings suggest this intervention warrants further study regarding not only the clinical benefits but

the safety, logistics and mechanism by which this colon saving procedure may work.

Sources of support. No financial support was provided to the authors for this work.

Disclosures. No conflicts of interest to disclose.

References

1. Aas J, Gessert CE, Bakken JS. Recurrent Clostridium difficile colitis: case series involving 18 patients treated with donor stool administered via a nasogastric tube. Clin Infect Dis 2003;36:580-585.
2. Garborg K, Waagsbo B, Stallemo A, et al. Results of faecal donor instillation therapy for recurrent Clostridium difficile-associated diarrhoea. Scand J Infect Dis 2010;42:857-861.
3. MacConnachie AA, Fox R, Kennedy DR, et al. Faecal transplant for recurrent Clostridium difficile-associated diarrhoea: a UK case series. Qjm 2009;102:781-784.
4. Rubin TA, Gessert CE, Aas J. Stool transplantation for older patients with Clostridium difficile infection. J Am Geriatr Soc 2009;57:2386.
5. Silverman MS, Davis I, Pillai DR. Success of self-administered home fecal transplantation for chronic Clostridium difficile infection. Clin Gastroenterol Hepatol 2010;8:471-473.
6. Yoon SS, Brandt LJ. Treatment of refractory/recurrent C. difficile-associated disease by donated stool transplanted via colonoscopy: a case series of 12 patients. J Clin Gastroenterol 2010;44:562-566.
7. Murphy C, Vernon M, Cullen M. Intravenous immunoglobulin for resistant Clostridium difficile infection. Age Ageing 2006;35:85-86.
8. Herpers BL, Vlamincx B, Burkhardt O, et al. Intravenous tigecycline as adjunctive or alternative therapy for severe refractory Clostridium difficile infection. Clin Infect Dis 2009;48:1732-1735.
9. You DM, Franzos MA, Holman RP. Successful treatment of fulminant Clostridium difficile infection with fecal bacteriotherapy. Ann Intern Med 2008;148:632-633.