



Successful Fecal Microbiota Transplant Delivered by Foley Catheter Through a Loop Ileostomy in a Patient With Severe Complicated *Clostridioides difficile* Infection

Shawn Philip, DO¹, Omar Tageldin, MD¹, Muhammed Sohail Mansoor, MD², and Seth Richter, MD²

¹Department of Internal Medicine, Albany Medical Center, Albany, NY

²Department of Gastroenterology, Albany Medical Center, Albany, NY

ABSTRACT

Clostridioides difficile infection (CDI) is a potentially life-threatening cause of diarrhea that can result in multiple complications. Fulminant CDI that is nonresponsive to antibiotics may require surgical ileostomy or fecal microbiota transplant (FMT). We present a case of a patient with fulminant CDI requiring surgical loop ileostomy who underwent a successful FMT delivered by Foley catheter through the ileostomy with symptom resolution. Delivery of FMT using a foley catheter in a patient with an ileostomy may be safe and effective for patients who are at a higher risk of complications associated with the instillation of FMT through colonoscopy with anesthesia.

INTRODUCTION

Clostridioides difficile infection (CDI) is a common but potentially life-threatening cause of diarrhea. It is the most commonly reported nosocomial pathogen in the United States and the most common cause of infectious diarrhea.¹ Patients may have moderate diarrhea, but this can dramatically progress to severe diarrhea with sepsis, colonic ileus, toxic megacolon, and even death if not treated appropriately. Diagnosis should be suspected in patients with 3 or more unformed stools within 24 hours often associated with abdominal pain and elevated white blood cell count. First-line treatment is oral vancomycin or oral fidaxomicin, which provides good resolution for most patients.² However, reoccurrence is common. American College of Gastroenterology guidelines recommend fecal microbiota transplant (FMT) for patients with a second or further relapse of CDI.³ Treatment is based on the concept that there is an imbalance of gut microbiota in patients with CDI. Fecal suspension is administered from a healthy donor with normal intestinal flora to the patient with CDI to re-establish natural intestinal microflora.^{4,5} Severe CDI on laboratory examination will demonstrate elevated white blood cell count $>15,000$ cells/mm³ or serum creatinine >1.5 mg/dL. Fulminant CDI is defined as *Clostridium difficile* colitis with significant systemic toxic effects including hypotension or shock, ileus, or toxic megacolon. It is often treatment refractory to nonoperative interventions including typical first-line antibiotics and rectal lavage. Treatment of fulminant CDI can include intravenous metronidazole with oral vancomycin. Vancomycin enemas are also used if ileus is present. Patients may require a total abdominal colectomy or diverting loop ileostomy if they do not respond to conservative treatment.⁶ We report a case of a patient who developed fulminant CDI requiring surgical loop ileostomy who underwent a successful FMT delivered by Foley catheter through the ileostomy with resolution of symptoms.

CASE REPORT

A 65-year-old man with hypertension initially presented with a subarachnoid hemorrhage that required external ventricular drain and coiling. He was admitted to the medical intensive care unit, and 8 days later, his hospital course was complicated by development of septic shock secondary to CDI after *C. difficile* toxin was found to be positive by enzyme immunoassay. Laboratory studies were significant for leukocytosis up to 39.5 K/uL and creatinine level of 1.86 mg/dL. He was initially treated with vancomycin liquid 125 mg every 6 hours through a nasogastric (NG) tube and IV metronidazole 500 mg every 8 hours. Four days later, he was started on



Figure 1. Computed tomography scan of the abdomen and pelvis demonstrating diffuse severe bowel wall thickening in the sigmoid and rectum with colon distended up to 6 cm concerning for toxic megacolon (arrow pointing).

fidaxomicin 200 mg per NG tube twice daily because of worsening sepsis and no improvement in diarrhea. Two days later, he developed worsening abdominal pain and distension with acute hypoxemic respiratory failure requiring mechanical ventilation.

Computed tomography scan of the abdomen and pelvis with IV and oral contrast showed diffuse severe bowel wall thickening in the sigmoid colon and rectum with colonic distension up to 6 cm concerning for toxic megacolon (Figure 1). Flexible sigmoidoscopy showed extensive pseudomembranes up to 50 cm from the anal verge. Subsequently, he underwent a laparoscopic loop ileostomy with colonic lavage as per Pittsburgh protocol.⁷ The patient was continued on IV metronidazole, and vancomycin irrigation was performed using a Foley catheter in the efferent limb of the loop ileostomy for 10 days. He was then weaned off vasopressors but remained in critical condition with persistent diarrhea, fever, and leukocytosis. The gastroenterology team was consulted for assistance with FMT because of persistent CDI. Antibiotics were held for 24 hours, and polyethylene glycol preparation was given through the Foley catheter in the efferent limb of the loop ileostomy. About 250 cc of donor stool obtained from Open Biome was then administered through the same Foley catheter into his loop ileostomy. His clinical condition significantly improved 3 days after FMT with the resolution of his leukocytosis and diarrhea. He was transferred to a general medical floor and eventually discharged to a rehabilitation facility. Repeat colonoscopy in 6 months showed resolution of CDI, and the patient had successful reversal of his ileostomy.

DISCUSSION

Fulminant CDI can result in complications that may require intervention such as colectomy or ileostomy because of increased

mortality.^{8,9} Our patient had fulminant CDI with toxic megacolon and required a laparoscopic ileostomy. He remained symptomatic, despite the ileostomy; thus, he underwent administration of FMT through the ileostomy using a Foley catheter. Donor stool is typically instilled through NG tube, rectal enema, oral pills, or through a colonoscopy. Donors may be patient-directed or universal donors through stool banks.¹⁰ Standard dosing is 50–100 g of fecal material diluted to 350- to 500-mL infusate. Kassam et al performed a meta-analysis and found that delivery through colonoscopy has a high efficacy of 84%–93% and is preferred in most studies. Delivery through NG tube may have a lower rate of efficacy between 81% and 86%.¹¹ The latest modality is usage of a pill formation to orally ingest. This is noninvasive and has fewer risks than colonoscopy, but the cure rate is around 70%.¹²

Studies have demonstrated that FMT is safe and effective in treating recurrent or severe CDI. Case reports and newer guidelines have suggested usage of FMT for patients with CDI-induced toxic megacolon who may be high-risk surgical candidates.^{3,13,14} Konturek et al showed decrease in proinflammatory cytokines levels and normalization of C-reactive protein and fecal calprotectin levels in a patient treated with FMT.^{15,16} Treatment has a favorable prognosis, although long-term safety is unknown because the modality is rather new. Previous reports have demonstrated successful FMT delivered by colonoscopy through a diverted ileostomy in a patient with Crohn's disease and delivery through endoscopically placed transcolonic enteral tubes.^{17,18} Our case demonstrated successful FMT for treatment of CDI using a Foley catheter through the efferent limb of a loop ileostomy. This novel method that was well-tolerated by our patient can be performed at the bedside without the usage of colonoscopy and can serve as a safe and effective method for FMT delivery without the need for procedural sedation.

DISCLOSURES

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