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Diverticulitis after Fecal Microbiota Transplant for *C. difficile* Infection

Amar Mandalia, MD¹, Colleen S. Kraft, MD², and Tanvi Dhere, MD³

¹Department of Medicine, Emory University, Atlanta, Georgia, USA

²Department of Pathology and Laboratory Medicine, Emory University, Atlanta, Georgia, USA

³Division of Digestive Diseases, Emory University, Atlanta, Georgia, USA

To the Editor

Fecal microbiota transplantation (FMT) has become a cornerstone of the management of recurrent and refractory *Clostridium difficile* infection (CDI) (1). Although it is safe and tolerable, adverse events have been reported with FMT via colonoscopy (1–5). Here we report the first case of diverticulitis occurring after an FMT for the treatment of recurrent CDI.

The patient was a 78-year-old Caucasian woman with a history of recurrent diverticulitis who had at least four episodes of recurrent CDI and had been treated with metronidazole and vancomycin. She also had a history of coronary atherosclerotic heart disease, insulin-dependent diabetes, and hypertension. She had a partial colectomy over 10 years ago for self-reported Crohn's disease that had since been in remission. Because of the history of recurrent CDI, an FMT via colonoscopy was performed. One hundred grams of donor stool diluted in 250 ml of sterile saline, as previously described, was infused into the most proximal colon (6). The colonoscopy revealed moderate diverticular disease in the left colon, and no macroscopic evidence of Crohn's disease. The FMT procedure was performed without difficulty, and the patient was discharged from the endoscopy suite with no complaints. On her ride home 2 to 3 hours after the procedure, the patient developed severe diffuse abdominal pain. She went to a local emergency department (ED) and was found to be febrile to 40°C. A CT scan performed at that ED visit confirmed uncomplicated left-sided diverticulitis (Figure 1). She was admitted to the hospital and placed on antibiotics, to which she responded well and was discharged home uneventfully. In the past 3 months post FMT, the patient has not had a recurrence of CDI despite being treated with antibiotics after the FMT.

Diverticulitis as a complication of FMT has never been reported in the literature. The pathogenesis of diverticulitis is not fully understood; however, the literature does highlight the role of dysbiosis as a plausible mechanism (7). Fecal material may collect in a diverticulum, leading to obstruction followed by distention and flora overgrowth. Aerobic

Correspondence: Tanvi Dhere, MD, Division of Digestive Diseases, Emory University, Atlanta, Georgia, USA. tdhere@emory.edu.

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and anaerobic microbes implicated in diverticulitis include *Escherichia coli*, *Streptococcus* spp., *Bacteroides* spp., *Peptostreptococcus*, *Clostridium*, and *Fusobacterium* (8). Our patient developed diverticulitis subsequent to FMT, which begs the question whether FMT can be an iatrogenic cause of dysbiosis through alterations of gut microbiome and subsequent inflammation.

Dysbiosis is also associated with inflammatory bowel disease (IBD). Case reports of worsening of IBD are reported after FMT, which may be related to attempts at realtering the gut microbiome (9). In recurrent CDI, FMT disrupts and typically restores the gut microbiome with commensal organisms that prevent it. Studies have shown increases in *Bacteroides*, *Lachnospiraceae*, *Peptostreptococcaceae*, and *Ruminococcaceae* in post-FMT stool samples, and abundances of *Streptococcus*, *Veillonella*, and *Enterococcus*; *Klebsiella* was significantly reduced in post-FMT stool samples (10–12). No differences in the relative abundance of a specific genus were seen when samples were compared by the time period of collection (12). This suggests that changes to gut microbiome occur relatively quickly after FMT and may be permanent.

The above studies demonstrate a rise in the number of gut microbiome post FMT that could be involved in the pathogenesis of diverticulitis. FMT may be a source of diverticulitis by the induction of an inflammatory response to the altered microbiome generated after FMT. Rare reports of diverticulitis after colonoscopy have also been reported; therefore, it may not be possible to determine cause and effect with regard to FMT and diverticulitis without additional reporting by others (13). FMT is a safe method to treat recurrent and refractory CDI; however, complications are known to arise, and diverticulitis should be considered as a potential complication.

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Figure 1. Focal segmental sigmoid wall thickening with surrounding inflammatory changes superimposed upon the background of sigmoid diverticulosis consistent with sigmoid diverticulitis.