

### Fatal Aspiration Pneumonia as a Complication of Fecal Microbiota Transplant

TO THE EDITOR—Fecal microbiota transplant (FMT) is increasingly being used to treat refractory *Clostridium difficile* infection (CDI). The growing body of evidence indicates that the procedure is efficacious, with low rates of reported adverse events [1, 2]. Of 14 patients treated with FMT at our center, we report the first complication, highlighting the consequent changes to our practice.

An 80-year-old patient with a past medical history of vasculopathy, osteoarthritis, and gout presented with recurrent CDI. The infection proved refractory to 3 courses of vancomycin, 2 of metronidazole, 1 of fidaxomicin, and 1 additional vancomycin course. Pseudomembranous colitis was confirmed on flexible sigmoidoscopy.

In December 2013 radiologically guided insertion of a nasojejunal tube failed due to technical difficulties experienced when accessing the duodenum. An attempt to endoscopically place a nasojejunal tube was abandoned owing to epistaxis. In February 2014, the FMT was delivered to the distal duodenum via the biopsy channel of an enteroscope, on this occasion under general anesthesia. Using a 50-mL syringe, 100–150 mL of solution was instilled over 12 minutes. Feculent liquid was regurgitated during the third 50-mL aliquot and the procedure was terminated immediately. Initially physiologically stable, the patient's condition deteriorated in the subsequent hours, with pyrexia of 38.3°C, increasing oxygen requirements, and further vomiting. Renal function deteriorated from baseline urea of 9.9 mmol/L to 14.7 mmol/L and creatinine from baseline 102 μmol/L to

135 µmol/L. C reactive protein rose to 164 mg/L from 4 mg/L pre-procedure and white cell count fell to  $3.5 \times 10^9$ /L from  $10 \times 10^9$ /L. Chest X-ray showed left midzone airspace shadowing. Intravenous metronidazole was commenced and oral vancomycin continued. Computed tomography pulmonary angiogram (CTPA) excluded pulmonary embolus and confirmed widespread bilateral consolidation. During the next 48 hours the patient's condition worsened. Metronidazole was substituted by meropenem. Septic shock supervened, necessitating intensive care unit (ICU) admission for multiorgan support. Sputum culture isolated *Escherichia coli* and *Pseudomonas aeruginosa*. Blood cultures also isolated *E. coli*. Linezolid and fluconazole were added empirically. Once discharged to a medical ward 14 days later, a turbulent course ensued, with several episodes of sepsis necessitating 2 additional admissions to the ICU. Repeat blood cultures proved sterile throughout. CTPA was again negative for pulmonary embolus and confirmed persistent dense consolidation of the left lower lobe. Despite treatment at this time with meropenem and caspofungin, the patient died of pneumonia 48 days post FMT procedure. Stool samples tested negative for *C. difficile* glutamate dehydrogenase and toxin A/B (Techlab Quik Check Complete, Orlando, Florida) on days 4, 11, 13, and 42 post FMT.

To our knowledge, this is the third reported death attributable to FMT; the others were due to toxic megacolon and septic shock [3] and to aspiration during sedation for colonoscopic FMT [4]. Our protocol now includes administration of an anti-emetic pre-procedure. General anesthetic is not common practice in FMT; therefore, the risk of aspiration peri-procedure may not be generalizable. We suggest that FMT via the upper gastrointestinal tract be performed only in the awake patient, with consideration of colonoscopic FMT when general anesthesia is required.

## Note

**Potential conflicts of interest.** All authors: No potential conflicts of interest.

All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

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