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Case Report

Colonic Perforation Caused by Methicillin-Resistant *Staphylococcus aureus* Enteritis After Total Gastrectomy: A Case Report

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A 68-year-old man underwent total gastrectomy and splenectomy for adenocarcinoma and low anterior resection for carcinoma in tubulo-villous adenoma of the rectum. Broad-spectrum antibiotics were administered for postoperative pancreatic fistula. Methicillin-resistant *Staphylococcus aureus* enteritis occurred on the 50th postoperative day and cecal perforation followed. The patient underwent construction of cecostomy with peritoneal drainage, and vancomycin was administered orally and per cecostomy for 2 weeks. The patient recovered well and was discharged at 35 days after re-operation in good general condition.

Key words: Colonic perforation – Methicillin-resistant *Staphylococcus aureus* enteritis – Total gastrectomy

Enteritis caused by methicillin-resistant *Staphylococcus a*ureus (MRSA) has been recognized as a postoperative complication, especially in compromised hosts. We report a case of colonic perforation caused by MRSA enteritis after total gastrectomy.

Case Report

A 68-year-old man underwent total gastrectomy with simultaneous splenectomy for poorly differentiated adenocarcinoma in stage pT3N1 and low anterior resection for carcinoma in tubulo-villous adenoma of the rectum in pTisN0 because he had synchronous rectal cancer found by preoperative colonoscopy. His past medical history included hypertension and subarachnoid hemorrhage. Prophylactic intravenous antibiotics (cefminox sodium) were administered perioperatively.

On the fourth postoperative day, the patient developed increasing abdominal pain accompanied by pyrexia and hypoxia. Computed tomography

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Fig. 1 CT showing thickening of the right colon (arrow).

(CT) revealed fluid collection under the left diaphragm, which was drained percutaneously. The aspirate had a high amylase level and was diagnosed as postoperative pancreatic fistula, for which broad-spectrum antibiotics (meropenem trihydrate) were administered. Despite drainage, the inflammation persisted, and antibiotics were changed to tazobactam/piperacillin hydrate, levofloxacin, and minocycline hydrochloride. On the 50th postoperative day, the patient developed abdominal distension with diarrhea, melena, and pyrexia. CT revealed thickening of the right colon (Fig. 1). The stool toxin assay results were negative for *Clostridium difficile*, while stool culture was positive for methicillin-resistant *Staphylococcus aureus* (MRSA).

Fig. 2 The intraoperative photograph showed perforation of the cecum (arrow).

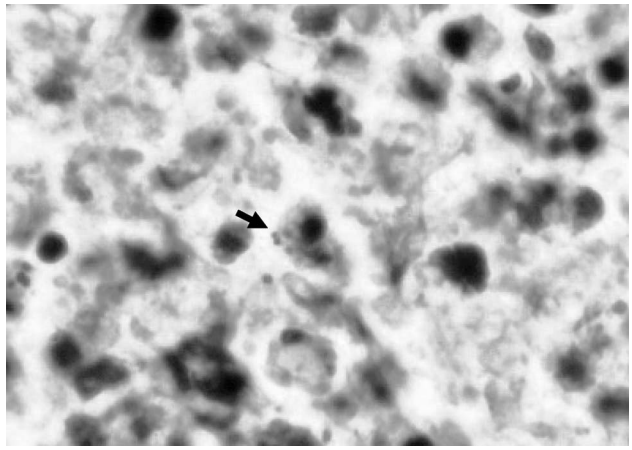

Fig. 3 Gram-positive cocci were demonstrated in the mucosa of the perforated cecum (arrow).

The patient was treated with oral vancomycin (VCM). However, he developed increasing abdominal distension and pain 7 days after administration of VCM. He required an emergency laparotomy for acute abdomen, when perforation of the cecum with associated peritonitis was identified (Fig. 2). The patient underwent cecostomy, peritoneal lavage, and drainage. Histologically, the resected cecum showed ulceration without pseudomembrane or ischemic changes and was infiltrated by neutrophils with gram-positive cocci (Fig. 3). Therefore, VCM was given orally and per cecostomy for 2 weeks.

The patient recovered well clinically and was discharged 35 days after the emergency operation.

Discussion

Staphylococcal enteritis was first described as a complication of antibiotic use in 1948,[1] and MRSA enteritis has become an important postoperative infection.[2,3] Several reports describe that gastrectomy, treatment with histamine H2 receptor antagonist, and use of broad-spectrum antibiotics were closely related to the development of MRSA enteritis.[2–4] *S aureus* ingested through the naso-oral route is not killed by gastric juice of lower acidity, and when it moves downward and proliferates in the lower digestive tract, MRSA enteritis can then easily occur. Also, *S aureus* is not a strong competitor, and its growth is limited by the microorganisms present in the intestinal flora. Therefore, the use of broad-spectrum antibiotics after gastrectomy is an important cause of MRSA enteritis.[3,4] In the current case, the patient underwent total gastrectomy and

was administered several broad-spectrum antibiotics for postoperative pancreatic fistula.

The symptoms of MRSA enteritis consist of high fever, abdominal distension, and watery diarrhea, which leads to sever dehydration and shock, as well as occasional multiple-organ failure.[5] However, intestinal perforation resulting from MRSA enteritis is rare. Nomura *et al*[6] reported perforation of the cecum and descending colon following MRSA enteritis after cadaveric renal transplantation. However, to our knowledge, there are no reports of intestinal perforation caused by MRSA enteritis after gastrectomy. Toxic megacolon is a medical emergency that requires coordinated intensive medical and surgical management. It is formally defined as the total or segmental nonobstructive dilatation (>5.5 cm) of the colon[7]; however, in our case, the diameter of the cecum was 5 cm.

Among the drugs used to treat MRSA enteritis, oral VCM has been the most common.[8] Oral VCM is the treatment of choice for postoperative MRSA enteritis because it is safe and effective. In the current case, we administered VCM orally and per cecostomy after emergency laparotomy, and the patient recovered well.

In conclusion, we experienced an extremely rare case of colonic perforation caused by MRSA enteritis and not by colonic obstruction after total gastrectomy. Strict and shorter term use of antibiotics seems to be important to avoid postoperative MRSA enteritis.

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