Case Report

Spontaneous Small Bowel Perforation of a Kidney Transplant Recipient : Case Report and Literature Review

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Small bowel perforation in kidney transplant recipients is a rare complication. Most cases of spontaneous bowel perforation after renal transplantation reported in the literature belong to the colon and are almost related to underlying lesions. In the present paper we present a 56-year-old man who experienced spontaneous small bowel perforation 8 months after a kidney transplant. We adopted anti-lymphocyte antibody as induction and used tacrolimus, mycophenolate sodium, and steroid for maintenance immunosuppressants. The recovery went well with the exception of one urinary tract infection episode and the patient was discharged 9 days after the operation. However, he suffered from epigastric dull pain with tarry stool eight months later. Immediate endoscopy and colonoscopy were arranged. The findings were superficial gastritis, esophageal diverticulum, and suspicious ulcerative mass near the Cecum. Computed tomography was arranged soon after, and it showed pneumoperitoneum with suspicious perforation in the terminal ileum. Emergent laparotomy was performed with hemicolectomy and ileocolostomy as first step due to severe abdominal contamination. Second step to restore bowel continuity by take-down of ileocolostomy was performed in three months later. The treatment plan worked without compromising the functionality of the graft. Thereafter we reported this rare case, reviewed the literature, and discussed the possible risk factors in kidney transplant recipients with spontaneous small bowel perforation.

Key words: kidney transplant, spontaneous, bowel perforation

Introduction

Gastroinstestinal perforation is a rare and lethal complication in kidney transplant recipients. The origin of reported cases are almost always colorectal.[1,2,3] The risk factors discussed in this situation included immunosuppression, diverticulosis, uremia, chronic constipation, colonic atherosclerotic

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changes,[1,2,4] and cytomegalovirus (CMV) infection.[5,6] Regarding small bowel perforation, risk factors of ischemia or ileitis were reported by Kyriaki Kakavia et al.[3] They studied 2,123 kidney transplant recipients and found only two cases of small bowel perforation in 11 bowel perforation recipients. Ponticelli and Passerini reported increased incidence of ischemia of small bowel in patients with polycystic kidney disease, ulcers of the small intestine from use steroids, and development of intestine ischemia from CMV infection.[1] Such conditions may compromise kidney recipients and lead to small bowel perforation. The symptoms and signs of small bowel perforation are often ordinary and cause a delay in their diagnosis. Immunosuppressants play a major role in impairing the ability of patients in localizing pain and masking abdominal infection. Such circumstances bring about a high mortality rate for the patients. Therefore, early recognition of symptoms-signs of bowel perforation and its prompt treatment are crucial in saving the life of the patient.

Case Report

The 55-year-old male patient had diabetes mellitus, hypertension, and chronic renal failure. He underwent 4 years of hemodialysis until he was given a donor kidney from an expanded-criteria donor on June 29, 2012. We used anti-thymocyte globulin 50 mg per day for 3 days as induction and tacrolimus, mycophenolate sodium, and steroids for post-operative immunosuppressants. Nine days later, he was discharged and followed up was performed at a clinic. We adopted three months of prophylaxis of CMV infection with valganciclorvir. On Novmber 27, 2012, positive CMV shell virus was detected while surveying an episode of diarrhea. We restarted valganciclovir again for another 3 months and the symptoms disappeared. No BK virus was detected in the blood. However, the kidney allograft was biopsied due to abnormal renal function and what we found was stage A polyomavirus nephropathy. Therefore we intended for treatment of nephropathy by tapering tacrolimus treatment, stopping mycophenolate sodium, and adding sirolimus. Unfortunately on January 23, 2013, he suffered from intermittent epigastric pain with tarry stool at the eighth month after surgery. The physical examination showed soft abdomen and mild distention. No muscle guarding was found. Panendoscopy was performed to survey tarry stool. The results revealed only superficial gastritis, esophageal diverticulum. Colonoscopy was also arranged due to negative findings of panendoscopy. The findings demonstrated suspicious ulcerative tumor mass near cecum (Fig. 1). CMV titer was checked with negative findings. Since there was an impression of malignancy, abdominal computed tomography was arranged but it revealed pneumoperitoneum (Fig. 2). Thus, emergent laparotomy was performed and the operative findings was 0.3 cm perforation near the terminal ileum. At the same time, we found the erythematous patches on the serosa of the cecum wall (Fig. 3). Therefore, we performed the right hemicolectomy with ileocolostomy procedure to prevent leakage of primary anas-

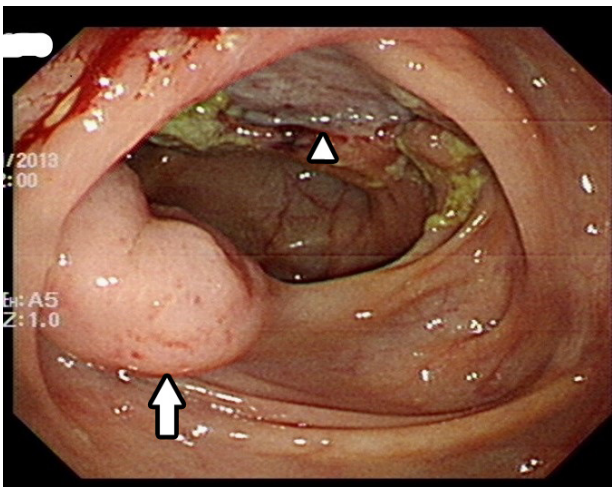

Fig 1. Colonoscopy: The arrow pointed to ulcerative tumor mass near cecum. The arrow head pointed to erythematous patch with ischemia-like ulceration.

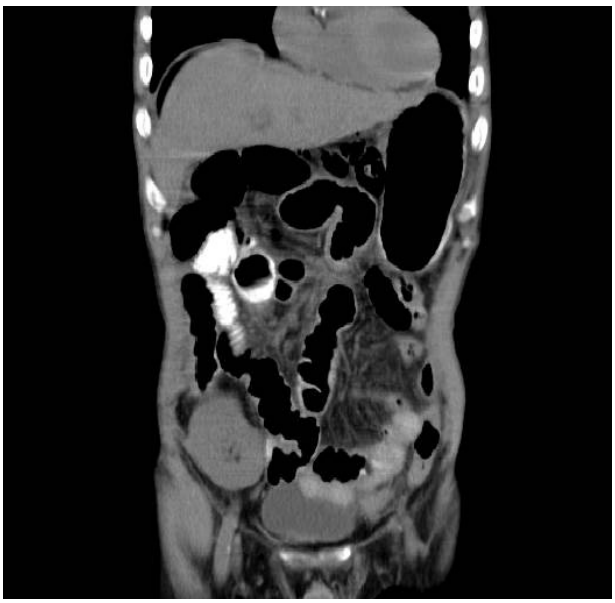

Fig. 2 Coronal view: Computed tomography revealed diffuse extraluminal free air in abdominal cavity.

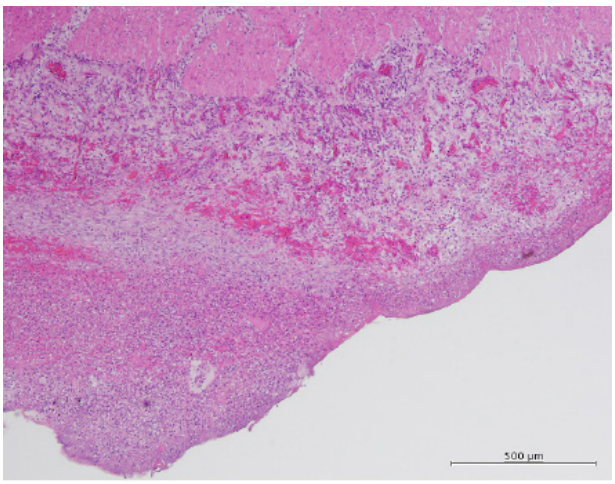

Fig. 4 Hematoxylin and Eosin, 40X: The serosa showed acute and chronic inflammatory cells infiltration, granulation tissue proliferation, hemorrhage and fibrinous exudate coating, consistent with perforation with peritonitis.

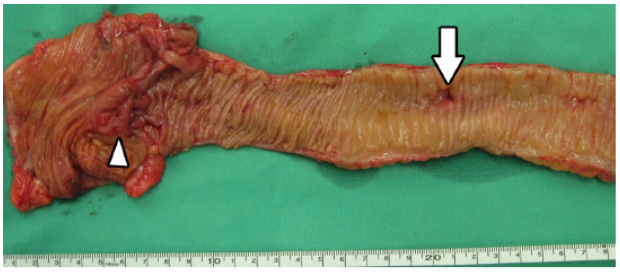

Fig. 3 Specimen, terminal ileum: The arrow pointed to perforation hole in the terminal ileum and the arrow head pointed to erythematous patches on the cecum

tomosis. Three months later, bowel continuity was restored in the patient by closure of stoma. The final pathology showed the mucosa of the ileum erosive and purulent fibrin coated on the serosa (Fig. 4). No evidence of CMV infection was found from pathologic examination. To current day, we have followed this patient with yearly CMV and BK virus and abdominal computed tomography with 6 months duration after closure of stoma. No apparent bowel lesion or CMV/BK virus in the blood were detected.

Discussion

Kidney transplantation, as we know in this era, has many complications that have yet to be resolved. Frequent among these are, gastrointestinal complications, which include oral lesion, esophageal disorders, stomach and duodenum disorder, small bowel disorder, diarrhea, colon disorders, and gastrointestinal malignancy.[1] After reviewing the literature, we found that the incidence of bowel perforation was between 1% to 20%, depending on race and regions.[1,2,4] Most gastrointestinal complications occur during the first year after transplantation year.[2] Nearly all reported cases originated in the colon, and seldom originated in the small intestine.[3]

Various predisposing factors leading to colon perforation include diverticulosis, steroid use, uremia, chronic constipation, and atherosclerotic change of mesenteric vascularization.[3] However, ulceration or even perforation of small bowel is a rare but dreadful complication after renal transplantation.[1] Catena et al. pointed out that 46 of 1611 renal transplants from 1976 to 2007 in one center in Italy found perforation in the colon, small bowel, stomach, and duodenum. It is implied that all gastrointestinal complications occurred during the first

year after transplant, when the dose of immunosuppressants were highest. The small bowel perforation was associated with cytomegalovirus infections and ischemia, whereas the colon perforation was associated with diverticulum.[4]

Gastrointestinal complications in kidney transplant recipients are not rare. Wadhwa et al.[11] reported their 1957 endoscopies in 1770 recipients and found the most common findings of colonoscopy in renal transplant recipients were ulcers. Nearly two-thirds of ulcers showed cytomegalovirous colitis histopathologically. They demonstrated endoscopic biopies play an important role in the diagnosis and management of GI disease in renal transplant recipients. However, the colonoscopic findings of our case revealed cecal ulcer without evidence of cytomegalovirus infection. We could not identify cytomegalovirus infection in specimen of small bowel perforation either.

The optimal surgical approach seems to be different in large and small bowel perforation in kidney transplant recipients. Kakavia et al. reported good outcome of two small bowel perforations in kidney transplant recipients which were repaired with segmental resection and primary anastomosis. But as for colon perforation, primary anastomosis had not been performed to avoid anastomotic leak.[3] However, in our case, the perforation site was close to the ileocecal valve and we were concerned about the cecum perforation on previous colonoscopic biopsy site. We decided to perform the right hemicolectomy with ileocolostomy procedure due to severe peritoneal contamination. Three months later, we performed the closure of stoma. The patient recovered well without event.

In our case, the patient received an expanded criteria kidney from a 61-year-old donor with positive reaction for anti-HBs, anti-HBc, CMV IgG, and EBV IgG. The creatinine level of donor at the time of brain death was 1.0 to 1.4 mg/dL. After transplantation, the recipient was regularly followed up at our urology clinics with prophylactic valganciclovir and immunosuppressants. We hypothesize that the possible causes of small bowel perforation are (1) the administration of Sirolimus,[7] (2) steroid use, (3) viral infection of CMV or BK virus,[7] or (4) mycophenolic acid. The latter, mycophenolic acid, has been shown to manifest localized irritating properties in the intestine. Its metabolite induces toxic damage via protein adduction formation to the intestine wall and plays a role in GI toxicity.[8]

Common side effects of sirolimus include abdominal discomfort, acne, pancytopenia, and wound healing disturbance due to antiproliferative effects.[7] Combination of sirolimus and steroid will results in possible ulceration and then perforation; therefore, it may mask symptoms and affect the patients' response to septic conditions which carries a high rate of mortality.[4,10] Also intestinal ischemia is a recognized complication after renal transplant. Ischemia was the cause of intestine perforation in 15% of patients in a series of 85 cases.[9] On the other hand, it is said that CMV infection may cause ulceration, erosion, and finally mucosal hemorrhage of the gastrointestinal tract.[7] However, the effect of anti-virus drugs was controversial.[8] Abderrahim et al. stated that anti-virus drugs are inefficient treatment for CMV, especially tissue-invasive CMV infection.[8] In order to clarify the definite cause of small bowel perforation, we need more evidence and data-based studies to confirm these hypotheses.

In conclusion, no matter the cause, early diagnosis and immediate intervention are important when perforation complications occur after kidney transplantation. Clinicians must beware of the risk factors during follow-up that result in severe gastrointestinal complications.

Acute abdomen is emergent and may need immediate evaluation. Plain films radiography or computer tomography can show the obstruction level or signs of perforation. Once perforation is diagnosed, an exploratory laparotomy

should be performed without delay so as not to endanger the patient's life.

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