Case Report

Ureterocolic Fistula Secondary to Colonic Diverticulitis

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We report a very rare case of ureterocolic fistula caused by colonic diverticulitis in a 52-year-old man. The patient was readmitted for sigmoidectomy and closure of a colostomy 12 month after the initial surgical procedure which had consisted of temporary transverse colostomy, lavage, and drainage for diffuse peritonitis caused by colonic diverticulitis. Physical examination at the time of the second admission revealed pneumaturia and an infected surgical scar in the lower abdomen. A double-contrast barium enema and fistulography through the surgical scar showed fistulas between the skin, sigmoid colon, and left ureter. Since the left kidney was functioning, sigmoidectomy with preservation of the left ureter was performed. Because of the severe adhesion, the location of the fistula could not be identified. We were able to dissect the severe adhesion guided by a palpable ureteral stent and to avoid damaging the ureter, even though the ureterocolic fistula was transected during the dissection. The postoperative course was uneventful and on postoperative day 14 the ureteral catheter was removed and the patient discharged.

Key Words : ureterocolic fistula, diverticulitis, ureteral stent

Introduction

The number of cases of colonic diverticulitis has been increasing in recent decades in association with the changes in diet and the so-called "aging society". Fistula formation is a common complication of diverticular disease of the sigmoid colon. Colovesical fistulas are one of the most frequent internal fistulas¹⁾, but ureterocolic fistulas are quite rare. We report a case of ureterocolic fistula secondary to colonic diverticulitis.

Case Report

A 52-year-old man who had undergone temporary transverse colostomy for diffuse peritonitis

caused by perforation secondary to diverticulitis of the sigmoid colon 12 months before was readmitted to our hospital for closure of the colostomy. Physical examination revealed a moderately nourished man with infected surgical scar in midline of the lower abdomen. He had pneumaturia, but the result of a urinalysis was normal. Laboratory findings included a hemoglobin concentration of 12.9 g/dl, a hematocrit at 39.7%, a leukocyte count of 6720/ μ l, and a platelet count of 325,000/ μ l.

Fistulography via the surgical scar revealed complicated fistulas between the skin, sigmoid colon, and left ureter. A double-contrast barium enema confirmed a fistulous tract between the sigmoid colon and left ureter, and diffuse colonic diverticuli were also found (**Fig. 1**). Colonoscopy showed stenosis of the sigmoid colon with inflammatory change. Drip-infusion pyelography (DIP) did not demonstrate the fistula to the colon. Computed

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Fig.1 Barium enema revealing a fistulous tract between the sigmoid colon and left ureter (arrowheads).

tomography (CT) showed thickening of the retroperitoneum with an inflammatory granulation tissue involving the descending and sigmoid colon. Magnetic resonance imaging (MRI) showed a fistula between the skin and sigmoid colon.

Sigmoidectomy and closure of the transverse colostomy were performed 12 months after the first operation. The inflammatory granulation tissue consisted of several segments of small intestine, the sigmoid colon, and the retroperitoneum. Although the sigmoid colon was severely adherent to the left ureter, the left ureter was identified by palpation of the ureteral catheter inserted before surgery for anatomical confirmation of the left ureter. We were able to dissect the severe adhesion guided by the palpable ureteral stent and avoid damaging of the ureter, even though the ureterocolic fistula was transected during the dissection. Because no urine leakage was observed, the fistula was not found. No spontaneous urine leakage was observed during

Fig. 2 Surgical specimen showing that the wall of the sigmoid colon is severely thickened by inflammatory granulation tissue. And several fistulas connected to ureterocolic fistula (arrowheads) and multiple sigmoid diverticuli were also found.

or after surgery.

Examination of the surgical specimen revealed that the wall of the sigmoid colon was severely thickened by inflammatory granulation tissue, and several fistulas including a colcutaneous fistula and ureterocolic fistula as well as multiple sigmoid diverticuli, were also found (Fig. 2).

The postoperative course was uneventful, and on postoperative day 14, the ureteral catheter was removed and the patient was discharged.

Discussion

Ureterocolic fistula is a very rare complication of diverticulitis. Before the 1940s ureterocolic fistula was frequently associated with tuberculosis, whereas in recent years chronic ureteral stone has been the most common cause of ureterocolic fistula. Trauma, surgical complications, Crohn's disease, colon and ureteral cancer, radiation and colonic diverticulitis can also lead to the formation of ureterocolic fistulas²⁾. Fistula formation is a common complication of diverticular disease of the sigmoid colon and occurs in about one fifth of diverticulitis patients with who are treated surgically. Colovesical fistulas are the most frequent internal fistulas. Colocutaneous fistulas are also

relatively common after surgery for diverticulitis, as in our own case¹⁾. Fistulas secondary to the inflammatory process in the colon may involve any organ in the pelvis, including the ureters, however, only seven cases¹⁻⁷⁾ of ureterocolic fistula caused by colonic diverticulitis have ever been documented. The typical symptoms are fecaluria and pneumaturia, and our patient had pneumaturia.

A barium enema is usually capable of demonstrating the fistula, as in our patient, and it is the most useful diagnostic modality. As Husted⁸⁾ noted, mean pressure in the gastrointestinal tract is higher than in the urinary system, making it possible to visualize the fistula and a part of the urinary system. However, urography is necessary to confirm the anatomy of urinary system before surgical treatment.

Spontaneous closure has been reported with adequate antibiotic therapy³⁾, but surgical intervention should be performed whenever possible. The choice of surgical procedure, include, colectomy, nephrectomy, and fistectomy. Since in the several cases of colovesical fistula in the literatures^{1,9,10)} the fistulas were recurred after surgical therapy without colectomy, colectomy is necessary to prevent the recurrence of the fistula. The need for nephrectomy depends on the functional status of the kidney involved. If the kidney is functioning, the urinary system should be preserved. It is sometimes very difficult to preserve the left ureter because of severe adherence to the sigmoid colon. As Cirocco²⁾ noted, a ureteral stent facilitates the difficult dissection. In our patient a ureteral stent that had been inserted before surgery was very useful in confirming the location of the left ureter and preventing left ureteral damage. Although the ureteral catheter allows identification of the exact location of the ureter, it is difficult to detect the exact site of the fistula. In our case, the fistula was transected

during the dissection without damaging the ureter. Stenting of ureteric repairs has reduced urological complications both in experimental models and in clinical practice¹¹⁾, so we left the ureteral stent for 2 weeks to prevent leakage of urine, and there were no signs of urine leakage or fistula formation. If the fistula cannot be found during surgery, fistectomy might not be necessary. Urine drainage catheter through a ureteral stent, should be effective in preventing urine leakage and in promoting spontaneous closure of the fistula.

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