Case Report

Recurrent graft pyelonephritis and pneumaturia resulting from a colovesical fistula secondary to silent diverticulitis

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Introduction

A colovesical fistula, first described by Cripps in 1888 [1], is an internal connection between the bowel and urinary tract caused by various inflammatory or neoplastic disorders. Diverticulitis of the colon is the most common cause of such fistulae, followed by Crohn’s disease, colonic, vesical, and female reproductive organ malignancies, trauma, radiation therapy, and appendicitis [2,3]. A case of colovesical fistula produced by long-term bladder outflow obstruction secondary to prostatic enlargement has been recently described [4]. Diverticulitis is a frequent complication of colonic diverticular disease. It usually presents with fever, abdominal pain, malaise and polymorphonuclear leukocytosis in immunocompetent patients.

We describe a case of colovesical fistula secondary to colonic diverticulitis presented in a kidney-transplant recipient as isolated recurrent graft pyelonephritis and pneumaturia without any clinical signs or symptoms secondary to diverticulitis. This complication should be suspected in such chronically immunosuppressed patients in spite of the absence of signs or symptoms of colonic inflammation when a colovesical fistula is diagnosed.

Case report

A 57-year-old kidney-transplant recipient was diagnosed with acute pyelonephritis. He had received a cadaveric kidney transplant 8 years before. His current immunosuppressive therapy included cyclosporin and low-dose prednisone. His renal function was excellent (serum creatinine 123.7 μmol/l, urea 5.81 mmol/l). Urine culture was negative, being treated with ciprofloxacin in an outpatient basis. Ultrasound examination of the allograft revealed no significant abnormalities.

Two months later the patient presented with fever, chills, dysuria, and pneumaturia. Physical examination was unremarkable. Laboratory evaluation revealed a white blood cell count 7400/μl with a normal differential and serum creatinine 123.7 μmol/l. Urinalysis revealed leukocyturia and microhaematuria; subsequent culture of urine demonstrated Escherichia coli. A new course of ciprofloxacin therapy was successful. Fever and symptoms remitted, and urine culture cleared, but pneumaturia persisted and an intravenous pyelography was carried out, revealing the presence of gas in the urinary tract (renal pelvis and ureter) (Figure 1). A colovesical fistula was confirmed by computerized tomography, which showed gas in the bladder and bowel adjacent to bladder dome as well as many diverticula with inflammatory signs (Figure 2). After CT, an abdominal X-ray with oral and intravenous contrast media showed the sigmoid colon touching with bladder dome and gas in the kidney graft pelvis and ureter (Figure 3). Barium enema revealed the diverticular disease affecting the sigmoid and descending colon but was unable to demonstrate the fistula.

Previous to surgery a third episode of acute pyelonephritis occurred secondary to Proteus mirabilis with good response to amoxycillin–clavulanic acid. The fistula was repaired in a single-stage approach by removing the fistula, closing the bladder wall, and resecting a section of sigmoid colon with an end-to-end anastomosis of healthy colonic margins. The patient currently remains well, without pneumaturia or urinary-tract infections, and with normal renal function.

Discussion

Vesicointestinal fistulae constitute 80% of urinary-digestive fistulae, and among them fistulae between bladder and sigmoid colon are the most common [5].

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Diverticulitis of the colon is the most common cause of such fistula, followed by Crohn’s disease and malignancies [2,3]. In our case, although the patient had no history of diverticular disease, the presence of colonic diverticula on CT and barium enema and the absence of other causes showed that the fistula developed as a consequence of an undetected diverticulitis, spreading from sigmoid colon to bladder, in spite of the absence of symptoms of such complication. The immunosuppressive therapy administered could be implicated in that silent course of diverticulitis.

Although the underlying pathological condition is generally intestinal, most symptoms are urological. Dysuria and pneumaturia occur in more than half of the cases [6], frequently associated with fecaluria, relapsing urinary-tract infections and gastrointestinal complaints ranging from mild abdominal cramps and diarrhoea to severe abdominal pain [7]. In the absence of recent cystoscopy, pneumaturia is highly suggestive of enterovesical fistula, reported in 41–85% of cases in the literature [8,9]. In our case, pneumaturia occurred at a late stage of the disease, during the second episode of pyelonephritis, as has been described. Urine culture in these patients usually results in either a pure growth or a mixed growth of bowel organisms [11].

No single radiological investigation has been found to be satisfactory in all cases in defining the fistulous tract [4]. A plain abdominal X-ray may show a fluid level in the bladder in 8–15% of cases, but a higher recognition rate (29%) is reported with an erect lateral view [9]. Barium enema shows a fistula in only one-third of cases but is helpful in establishing the underlying colorectal disease [11]. There are few reports concerning transabdominal ultrasound as a diagnostic means in colovesical fistula. The described ultrasound findings (bladder and adherent bowel connected by an ‘echogenic beak’ and consequent passage of air and echogenic material on abdominal compression) were not discovered in our case [12].
Computerized tomography has been proposed as an effective means of diagnosis; it has a diagnostic accuracy of more than 90% because of its ability to detect small amounts of free air in the bladder. The CT findings used to confirm the presence of a colovesical fistula secondary to diverticulitis are the presence of diverticula in association with gas in the bladder in patients without prior urinary instrumentation, oral contrast medium in the bladder and local colonic thickening immediately adjacent to an area of locally thickened bladder [10]. CT findings in our case are the same as described.

Intravenous urography, a diagnostic modality that provided a diagnosis in only 5% of cases [8], showed gas in the allograft pelvis and ureter, probably due to the location of the allograft and the presence of reflux through the ureteovesical anastomosis.

In our case cystoscopy was not carried out because the diagnosis of colovesical fistula was made previously, though it is the most accurate and effective diagnostic modality [8].

Traditionally, fistula repair was performed in multiple stages. Nowadays, one-stage resection of the involved bowel, the approach performed in our patient, is the procedure chosen in the absence of abscess or bowel obstruction [13]. Comparison of single vs multi-stage approaches revealed that the total complication rate, frequency of additional procedures, rate of infectious complications, and length of hospitalization were no higher for the single-stage repair [8]. In our opinion the surgical procedure in a kidney transplant recipient with a colovesical fistula should not be different from normal.

Diverticular disease is a disorder related to chronic renal failure and replacement therapies. Diverticulitis remains a significant problem, with higher than expected mortality in immunosuppressed patients. Kidney transplant recipients are at a higher risk of malignancies, including intestinal neoplasms. In spite of the increased frequency of diverticular disease and malignancies (the two most common causes of colovesical fistula) in the renal transplant population, to our knowledge, this is the first report of colovesical fistula in a kidney transplant recipient.

In summary, the effect of immunosuppressive therapy reducing the inflammatory response, was probably the reason for the silent course of diverticulitis in our patient during months without abdominal symptoms, clinical signs, or laboratory findings; recurrent urinary-tract infections were the first signs of intestinal disease, due to the colovesical fistula. We must consider the diagnosis of diverticulitis and colovesical fistula when a kidney transplant recipient presents with relapsing urinary tract infection, fecaluria and/or pneumaturia, even without prior intestinal signs.

References


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