ANNALS OF GASTROENTEROLOGY 2006, 19(4):342-346

Original article

Ileovesical fistulas in Crohn's disease: Clinical features and therapeutic manipulations in 5 patients

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SUMMARY

The aim of this study was to describe the clinical details, and diagnostic and therapeutic manipulations applied on 5 patients with Crohn's disease who developed enterovesicular fistulas during the course of the underlying inflammatory bowel disease. These patients represent a percentage of 2.4% (5 out of 206) of patients with Crohn's disease seen and followed-up in our institution during the last fifteen years. There were 3 men and 2 women aged 34, 22, 32, 46 and 49 years, respectively. Small bowel was affected in 4 and concurrently the small and large bowel in 1 patient. During diagnosis of enterovesicular fistula, Crohn's disease was active in all cases. Main symptoms included pneumaturia, fecalurea, fever, urgency, and abdominal pain. Colonoscopy did not offer significant diagnostic aid. Abdominal computed tomography and barium enema helped in one case. Cystoscopy revealed a picture compatible with cystitis in all cases and a protruding mass in one. In one case the administration of Infliximab, the chimeric antibody against tumor necrosis alpha, resulted in temporary improvement. The administration of suitable antibiotics resulted in temporary disappearance of *E. coli* strains from urine in all cases. All patients were finally operated on. The surgical procedure applied was detachment of the inflamed bowel loop from urinary bladder and surgical closure of the fistula in all patients, drainage of the accompanied abscess in one case and partial enterectomy with end-to-end anastomosis in two cases. It is concluded that enterovesicular fistulas are a potentially dangerous complication of Crohn's disease, requiring surgical treatment.

Key words: Crohn's disease, fistulas, urinary complications, enterovesical fistulas

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INTRODUCTION

Internal fistulas in patients with Crohn's disease are found in a percentage of about 5-10%. However, enterovasicular fistulas are considered to be a quite rare and dangerous complication of the underlying inflammatory bowel disease, as they can cause recurrent bouts of urinary infections, leading to permanent damage of both kidneys.[1-5]

Descriptions concerning the clinical course, diagnosis and treatment of ileovesicular fistulas are relatively rare in the international medical literature, while they are completely absent from the Greek literature. Diagnosis is usually made on the basis of the clinical grounds, supported by imaging techniques. Conservative treatment usually offers no significant benefit.

The aim of this study is to describe the clinical details and the diagnostic and therapeutic manipulations applied in a cohort of five cases of patients with Crohn's disease and ileovesicular fistulas, who were diagnosed in our department during the last fifteen years.

PATIENTS - METHODS

There were 5 patients (3 men and 2 women, aged 34, 32, 22, 46 and 49 years respectively) with Crohn's disease located in terminal ileum in 4 patients and concurrently in the small and large bowel in one patient (Table 1). These patients represent a percentage of 2.4% of 206 patients with Crohn's disease seen and followed-up in our department during the last 15 years. At the time of diagnosis of enterovesical fistula, the

Table 1. Clinicoepidemiological characteristics of the patients studied

Parameter	Cases 1	2	3	4	5
Sex					
Men	+	+	+		
Women				+	+
Age (years)	34	22	46	33	21
Location of disease					
Small bowel	+	+	+	+	
Small & large bowel					+
Duration of disease (years)	4	6	9	12	4.5

underlying inflammatory bowel disease was active in all patients (Crohn's Disease Activity Index >210 points).

RESULTS

Clinical manifestations

The main clinical symptoms of the patients were pneumaturia (5/5, 100%), fecaluria (4/5, 80%), clinical symptoms of urinary infection (3/5, 60%), fever (2/5, 40%), abdominal pain (1/5, 20% including the case of the patient with intraabdominal abscess) and urgency, were the cardinal symptoms. Although clinical and laboratory findings compatible with urinary infection were noticed in three patients and despite the theoretical risk, none of them developed clinical signs of severe urinary infection. Of minor significance were symptoms like anorexia, fatigue and loss of weight.

Diagnostic modalities

Cystoscopy showed signs of cystitis but without clear evidence of the presence of fistula in all patients. In one case cystoscopy revealed a protruding area of granulomatous tissue of size greater than 1cm. The initial impression of the urologist was that the lesion represented a urinary papilloma. However, histology showed a typical picture of granulomatous tissue.

Computed tomography scan showed terminal ileum involvement with narrowing lumen and thickness of the bowel wall but not clear evidence of the existence of fistula (Figure 1). Barium enema detected the presence of fistula in two cases. Urinary examination showed abundance of leucocytes and red cells as well as a large amount of fecal material. Urinary culture was positive in all cases. The responsible microbe in all cases was *E. Coli.*

Therapeutic manipulations

Table 2 shows the conservative therapeutic manipulations applied. Concerning improvement of symptoms,

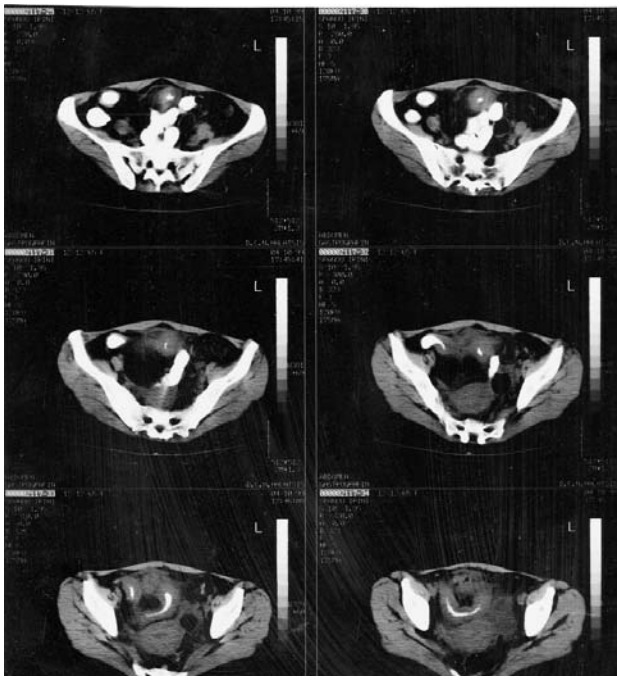

Fig. 1. Computed tomography abdominal scan showing considerable thickness of the bowel wall of the terminal ileum accompanied by dullness of the mesenteric fat compatible with Crohn's disease. Fibrous elements and dullness of the pericystic fat in the posterior-lateral right wall of the bladder are clearly visible due to the presence of adhesions and fixation of a terminal ileum loop on the wall of the bladder.

administration of antibiotics and immunosuppressants offered little benefit. In two cases, the previously positive urinary cultures became negative. In one patient administration of the chimeric antibody against tumor necrosis factor (Infliximab) (two doses of 5mg/KgBW, 0 and 2nd week), resulted in temporary improvement of the symptoms but no closure of the fistula.

Surgical treatment was finally applied in all patients (Table 3). The type of surgical procedure was destruction of the inflamed bowel from the bladder and close of the fistula in three cases, and drainage of a local abscess in two cases. Enterectomy and end-to-end anastomosis was performed in three cases. No perioperative mortality and no significant perioperative morbidity were noticed. Figure 2 shows a surgical specimen of a woman with terminal ileum Crohn's disease and an accompanied vesical fistula.

DISCUSSION

Ileovesical fistulas represent a rare, but quite important complication of Crohn's disease. They are probably derived from the extension of an intrapelvic abscess. It is

Table 2. Conservative treatment applied

	Patients				
Treatment	**1**	**2**	**3**	**4**	**5**
Azathioprine			+		
Antibiotics plus Metronidazole	+	+	+	+	+
Mesalazine	+	+	+	+	
Infliximab (Remicade)				+	

Table 3. Type of surgical treatment

Patients					
Operative procedure	**1**	**2**	**3**	**4**	**5**
Detachment of bowel from bladder	+	+	+	+	+
Drainage of local abscess	+	+	+		+
Enterectomy plus end-to-end anastomosis	+	+	+	+	

well accepted that intraabdominal abscesses on the ground of Crohn's disease start as mesenteric abscesses connected with the surrounding tissues, which consequently drain their content via a fistula.

Although a significant proportion of patients with Crohn's disease develop urinary complications during the course of their disease, the appearance of ileovesical fistulas is quite rare and this actually could be the reason for the small number of relevant reports in the international literature. In a relevant study[1], six out of 312 patients with Crohn's disease (1.9%) developed ileovesical fistulas, a proportion quite similar with that found in our series (2.4%). Of 400 patients identified with Crohn's disease in the study of Gruner et al, eight (2%) were diagnosed with enterovesical fistulas[6]. In all patients terminal ileum was affected, a finding also confirmed in our study.

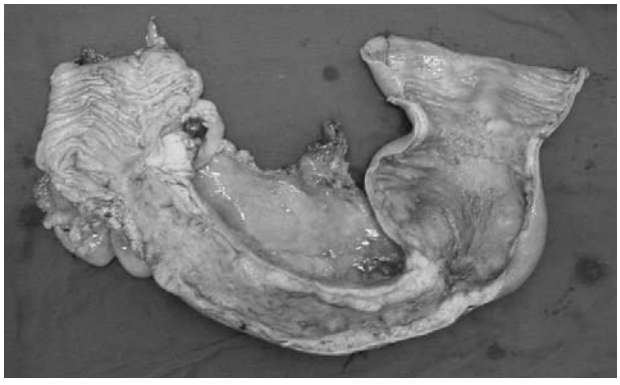

Fig. 2. Surgical specimen of patient number 4. The inflamed part of the bowel, along with the site of the fistula, is clearly shown.

It is of interest to notice that most of our patients were men a finding similar to other reports.[1,7] The anatomy of the affected area, (location of the uterus between bladder and bowel) could probably be the most logical explanation.

Increased body mass index is considered to be a predisposing factor.[8] However, none of our patients had BMI above 25.

Concerning clinical presentation, the main clinical symptoms were pneumaturia, fecaluria and clinical signs of urinary infection. Findings similar to ours were described by others.[7] In the study of Gruner et al[6] clinical features included pneumaturia (88%), fecaluria (38%), hematuria (63%), and urinary tract infection symptoms (88%).

Diagnosis of internal fistulas in patients with Crohn's disease improved considerably with the application of magnetic resonance imaging and computed tomography of the abdomen along with the classical imaging techniques.[5] It has been suggested that ultrasound and computerized tomography scan demonstrated good specificity, sensitivity, and positive and negative predicting values for urologic complications. Computed tomography scan has been valuable in identifying gas within the bladder in these patients.[9]

However, detection of ileovesical fistulas with CT scan seems not to be so significant, as it is in cases of enteroabdominal or perineal fistulas.

Recently, it was described that the application of indocyanine green aided significantly in the final diagnosis. In a relevant study of 12 patients with Crohn's disease who were suspected from their clinical manifestations of having enterovesical fistulas, indocyanine green was administered by mouth or intrarectally. The dye was detected in the urine by a colorimeter. The method gave positive results in 92% (11 of the 12 patients), while the detection rate by the classical imaging techniques was only 17%.[10]

Cystoscopy and/or cystography seem to be helpful in some cases.[11] Cystoscopy has proven useful in identifying the fistulous tract and in evaluation of the ureters. In one study cystoscopy and CT of the abdomen/pelvis had the highest diagnostic yield (74% and 52%, respectively).[7] Cystoscopy and urine cytology for faecal material could be the first-line investigations in all patients with a suspected enterovesical fistula.[12] However, in our patients cystoscopy did not offer significant diagnostic benefit except of that of cystitis. In one case the protruding granulomatous tissue inside the bladder was erroneously evaluated as a benign cyst tumor (papilloma). A case quite similar to one of our cases was recently described by Benchekroun et al.[13] Their

patient presented with urinary symptoms manifesting as bladder tumor. Cystoscopy revealed a bladder tumor without showing the fistula orifice. Transurethral resection of the tumor revealed an inflammatory pseudotumor of the urinary bladder. Magnetic resonance imaging confirmed the bladder tumor and a sigmoidovesical fistula as well. Barium contrast studies established the presence of numerous enterovesical fistulas. Partial resection of the ileum, ileostomy, colostomy and suture of the bladder fistulas was performed.

Treatment of asymptomatic fistulas must be –at least at the early stages- conservative. However, fistulas causing symptoms require conservative and/or surgical intervention. Drugs that have been used with different degrees of success in patients with Crohn's disease and entero-abdominal or ileovesical fistulas include azathioprine, 6-mercaptopurine, myophenolate mofetil, cyclosporine A, tacrolimus, and Infliximab[4]. Contrary to the satisfactory results obtained in patients with Crohn's disease and entero-abdominal fistulas, the chimeric antibody against tumor necrosis factor-α, did not offer significant benefit in one of our patients, a finding which is in agreement with other reports.[14]

So far, there are no published prospective studies comparing conservative versus surgical treatment in patients with internal fistulas. The available data refer generally to clinical behavior of Crohn's disease or describe data from retrospective studies. It seems certain however, that surgical treatment is the treatment of choice.[1,4,11] It must be stressed that all of our patients were referred to surgical treatment, which also applied to patients in other series. More specifically, surgical treatment including resection of the inflamed bowel was applied in all cases of Ikeuchi et al[2] and Ben Ami et al[1]. In our series, segmental enterectomy was also applied concurrently with closure of the opening of the fistula in the bladder. Recently, laparoscopic surgery for enteric fistulas in Crohn's disease patients seems to offer the earliest recovery seen with other laparoscopic colorectal operations.[15]

Recurrence of abdominal fistulas appeared in a significant proportion of patients (34%)[3]. During the follow-up period of nearly 6.5 years no recurrence of ileovesical fistula was noticed in our patients.

In conclusion we can assume that:

1. Ileovesical fistulas, although rare in patients with Crohn's disease, is a complication requiring prompt diagnosis and therapy.
2. Diagnosis is based mainly on clinical symptoms and the indirect findings of cystoscopy. Pneumaturia is a strong clinical indicator of enterovesical fistula.
3. In all cases Crohn's disease involves the small bowel.
4. Administration of antibiotics, immunosuppressive and immunomodulating drugs does not result in closure of the fistula.
5. Surgical treatment is required in all cases and must include closure of the stoma in the wall of the bladder and resection of the involved bowel part as well. Surgical procedures should always include resection of affected bowel. The bladder defect can safely be closed using absorbable suture.
6. Recurrences of the fistulas are rare.

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