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Inflammation and infection

A case of emphysematous intrascrotal abscess secondary to sigmoid coloseminal fistula

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ABSTRACT

A 54-year-old male patient presented with pneumaturia. Right scrotal swelling was observed. CT showed an intrascrotal abscess with gas formation. MRI showed a fistula extending from the sigmoid colon to the seminal vesicles. Since there are many diverticula in the sigmoid colon, an abscess caused by diverticulitis may have formed a fistula. The scrotal abscess was drained; however, the pus discharge did not decrease. A colostomy was then performed, and the scrotal infection rapidly improved. Sigmoidectomy and fistula transection were performed 11 months after the colostomy. Prompt diagnosis of a sigmoid coloseminal fistula using imaging has led to optimal treatment.

1. Introduction

Colovesical fistulas are the most common type of fistulas between the colon and genitourinary organs.[1] Colovesical fistulas are often caused by colonic diverticulitis, and the increase in the frequency of diverticulitis due to the westernization of the Japanese diet and the increase in the aging population are reported as the reasons for the high incidence of colovesical fistulas.[1] The sigmoid colon and seminal vesicles rarely form a fistula compared with a colovesical fistula. The anatomical intervention of the bladder between the sigmoid colon and seminal vesicles and the distance between the sigmoid colon and seminal vesicles are thought to be the reasons for the low incidence of coloseminal fistulas.[2] Many fistulas between the seminal vesicles and gastrointestinal tract occur with the rectum adjacent to the seminal vesicles, which are often caused by Crohn's disease, surgery for rectal cancer, surgery for prostate cancer, or radiation proctitis.[2]

Herein, we report a case of an emphysematous scrotal abscess due to a sigmoid coloseminal fistula, possibly caused by colonic diverticulitis.

2. Case presentation

A 54-year-old man presented with left lower abdominal pain that persisted for some time and resolved spontaneously. Pneumaturia had appeared a month prior, and right scrotal pain had developed 5 days ago. He was prescribed levofloxacin by a neighborhood doctor, but the symptoms did not improve. The swelling in the right scrotum worsened, and he visited our hospital. The patient had diabetes mellitus, hyperlipidemia, hypertension, and a history of cerebral infarction. The right scrotum was swollen, and part of the scrotal skin was necrotic. Blood tests revealed an elevated white blood cell count of 19,700/μL and elevated C-reactive protein of 17.0 mg/dL. The urine sediment contained numerous leukocytes and bacteria. Computed tomography (CT) revealed intrascrotal fluid with gas formation in the bladder and vas deferens (Fig. 1A–C). He was diagnosed with an emphysematous intrascrotal abscess. The infection appeared to spread from the urinary tract to the scrotum through the vas deferens. The scrotum was incised and the abscess was drained. Dark red pus with fecal odor was discharged. The abscess lumen was washed with saline and two Penrose drains were placed. A urethral catheter was also placed because CT showed gas retention in the bladder (Fig. 1B). Intravenous administration of piperacillin-tazobactam was started. Communication between the sigmoid colon and seminal vesicles was suspected on CT, and a fistula from the sigmoid colon to the seminal vesicles was clearly identified by magnetic resonance imaging (MRI) (Fig. 2). Since there are multiple diverticula in the sigmoid colon, it was speculated that diverticulitis formed an abscess in the perirectal area, and the abscess communicated

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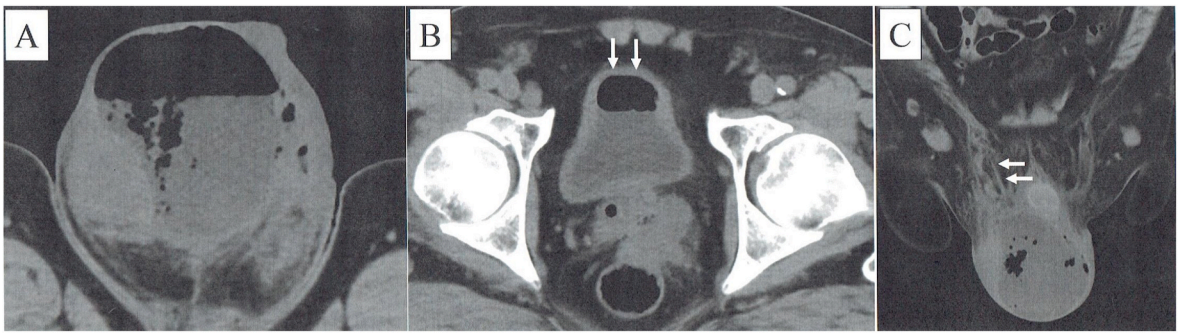

Fig. 1. CT findings at admission. A: Intra-scrotal fluid with gas formation. B: Gas formation in the bladder. C: Gas formation in the vas deferens.

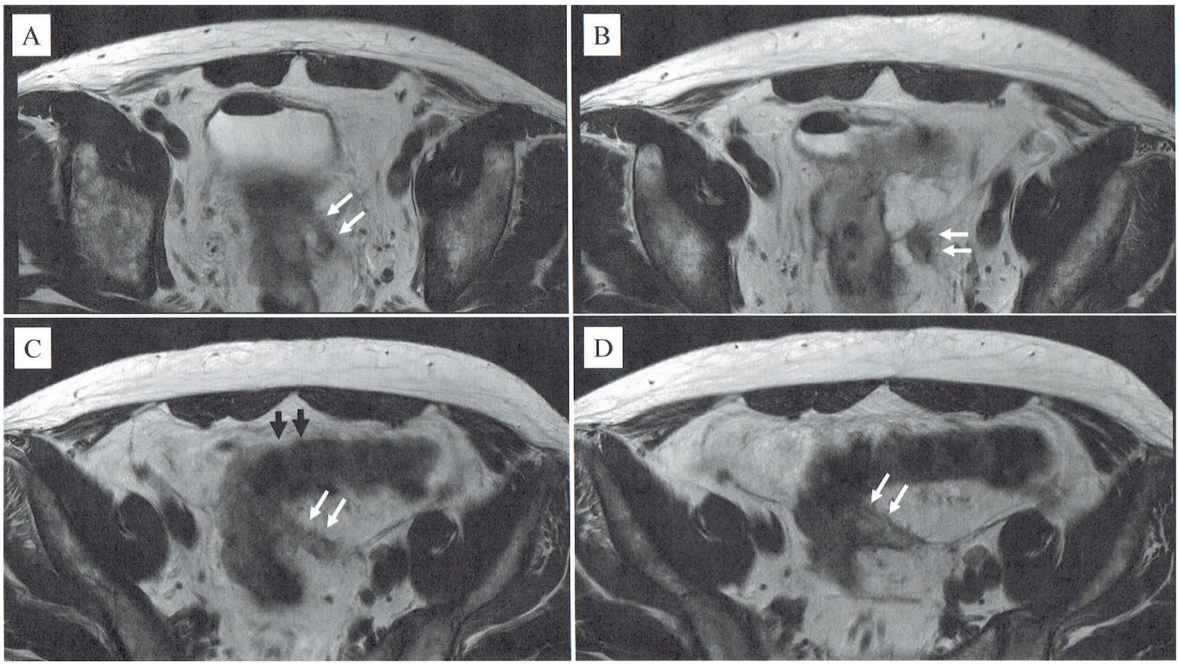

Fig. 2. MRI findings of the coloseminal fistula. A: The fistula is connected to the seminal vesicle (white arrows). B: The fistula near the seminal vesicle (white arrows). C: The fistula is connected to the sigmoid colon (white arrows). Black arrows point the sigmoid colon. D: The fistula close to the sigmoid colon (white arrows).

with the seminal vesicles. *Escherichia coli* was identified using a pus culture. The outflow of pus from the drains continued even after the drainage. A transverse colostomy was created on the third day after admission. The amount of pus from the drains decreased, and the patient's condition improved rapidly. The patient was discharged from the hospital on the tenth postoperative day, and the scrotum was washed in

Table 1
Summary of 3 patients with sigmoid coloseminal vesicle fistula.

Cases (author, years)	Age	Comorbidity and past history	Symptoms	Initial treatments	Second treatments/third treatment	Recurrence of GU infection	Comments
Case 1 (ref. 3)	67	DM	Peumaturia, dysuria, scrotal swelling	Hartmann with scrotal exploration and drainage	Colostomy closure (5 mo after Hartmann)	ND	Prerectal absess
Case 2 (ref.2)	51	Sigmoid diverticulitis (6 years before)	Peumaturia, scrotal pain, gross hematuria	Anterior resection of colon and ligation of the fistula	None	No recurrence for 6 mo after initial treatments	Direct communication
Case 3 (Present case)	54	DM, sigmoid diverticulitis?	Peumaturia, scrotal swelling	Scrotal exploration and drainage + Hartmann (2 days later)	Sigmoidectomy and transection of the fistula by vessel sealing device /colostomy closure (7 mo after the sigmoidectomy	No recurrence for 26 mo after initial treatments	Abdominal pain 2 mo before admission (sigmoid diverticulitis?)

DM: diabetes mellitus, GU: genitourinary, mo: months, ND: not described.

the shower. There was no outflow of pus in the scrotal area 3 months after the colostomy creation and the scrotal infection visually completely healed. Eight months after the colostomy showed a marked reduction in the coloseminal fistula, but the fistula remained radiologically. Sigmoid resection and descending colon-rectal anastomosis were performed 11 months after the colostomy. In the operation the coloseminal fistula was identified and the fistula was transected by vessel sealing device. There was pathologically no malignant tumor in the resected sigmoid colon and the coloseminal fistula. The colostomy closure was done 7 months after the sigmoid resection. Genitourinary infection did not recur for 26 months after the colostomy creation.

3. Discussion

Sigmoid coloseminal fistulae are quite rare. In this case, diverticulitis of the sigmoid colon possibly caused an abscess in the perirectal area that communicated with the seminal vesicles. Since the gastrointestinal tract communicated with the intrascrotal organs through the seminal vesicles and vas deferens, a transverse colostomy in addition to scrotal drainage was created to improve the intrascrotal infection.

CT performed on admission showed an intrascrotal abscess with gas formation in the bladder and spermatic cord. The CT findings allowed for the early diagnosis of an emphysematous intrascrotal abscess. Early drainage can be performed to prevent exacerbation of the infection. We also suspected communication between the sigmoid colon and seminal vesicles on CT. Additional MRI clearly showed a fistula communicating from the sigmoid colon to the seminal vesicles. Because he had lower abdominal pain approximately 2 months before admission and multiple diverticula of the sigmoid colon were observed on CT, it can be speculated that diverticulitis caused an abscess around the sigmoid colon, extending to the perirectal area and communicating with the seminal vesicles. The infection then spreads to the scrotum through the vas deferens. Determining the cause of the intrascrotal abscess led to prompt colostomy.

Sigmoid coloseminal fistula is extremely rare because of anatomical reasons.[2,3] A sigmoid coloseminal fistula has been found in only three cases, including the present case (Table 1). Two patients had diabetes and two had sigmoid diverticula. Pneumaturia and scrotal infection were observed in all the cases. The sigmoid coloseminal fistula was caused by abscess formation near the rectum in Case 1. We suspect a similar mechanism of fistula formation in the present case. Communication between the sigmoid colon and seminal vesicles was directly induced by chronic inflammation due to diverticulitis of the sigmoid colon in Case 2. Regarding the treatment method for sigmoid coloseminal fistula, two patients first underwent a colostomy (Hartmann procedure) and a drainage of scrotal abscess to subside the inflammation. Sigmoidectomy and ligation of the fistula (Case 2) or transection of the fistula (the present case) was done. Genitourinary infection did not recur in two patients after their initial treatments. Clinical information regarding the recurrence of genitourinary infection was not described in another one patient (Case 1). There were no findings that suspected the presence of malignant tumors in the three cases.

4. Conclusions

Here, we report a rare case of an emphysematous intrascrotal abscess secondary to a sigmoid coloseminal fistula, possibly caused by diverticulitis. Prompt diagnosis of a sigmoid coloseminal fistula using imaging has led to optimal treatment.

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Declaration of competing interest

The authors declare no conflict of interest.

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