



Case Report

Abdominal wall abscess resembling urachal carcinoma caused by ileal diverticulitis

Naoki Imasato,¹ Toshiki Kijima,¹  Atsuko Takada-Owada,² Junki Fujita,³ Kohei Takei,¹ Issei Suzuki,¹ Daisaku Nishihara,¹ Takatoshi Nakamura,³ Kazuyuki Ishida² and Takao Kamai¹ 

Departments of ¹Urology, and ²Diagnostic Pathology, and ³Center for Colorectal Surgery, Dokkyo Medical University, Tochigi, Japan

Abbreviations & Acronyms

CT = computed tomography
FDG-PET = 18F-fluorodeoxyglucose positron emission tomography
MRI = magnetic resonance imaging

Correspondence: Toshiki Kijima, MD., Ph.D., Department of Urology, Dokkyo Medical University, 880 Kitakobayashi, Mibu, Shimotsuga, Tochigi 321-0293, Japan. Email: tkijima@dokkyomed.ac.jp

How to cite this article:

Imasato N, Kijima T, Takada-Owada A *et al.* Abdominal wall abscess resembling urachal carcinoma caused by ileal diverticulitis. *IJU Case Rep.* 2023; 6: 73–76.

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial License](#), which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

Received 23 May 2022;
accepted 8 September 2022.
Online publication 15
September 2022

Introduction: We report a rare case of abdominal wall abscess caused by ileal diverticulitis that developed along the midline below the umbilicus and resembled a urachal carcinoma.

Case presentation: A 76-year-old woman with diabetes presented with abdominal enlargement below the umbilicus. Computed tomography revealed a well-enhanced mass, which was visualized on magnetic resonance imaging as a continuous mass connected to the restiform structure, extending from the umbilicus to the bladder. As the mass showed high uptake on 18F-fluorodeoxyglucose positron emission tomography, urachal carcinoma was suspected, and surgery was subsequently performed. As the tumor adhered to the ileum, partial resection of the small intestine was required. The pathological diagnosis was abdominal wall abscess associated with ileal pseudodiverticulitis.

Conclusion: Although abdominal wall abscess caused by ileal diverticulitis is rare, it should be considered as a differential diagnosis of urachal carcinoma.

Key words: abdominal wall abscess, diverticulitis, fluorodeoxyglucose positron emission tomography, ileal diverticulum, urachal cancer.

Keynote message

Ileal diverticula are rare; however, they can cause diverticulitis, which may result in a fistula or abscess involving the surrounding organs. Although extremely rare, abdominal wall abscess caused by diverticulitis should be considered as a differential diagnosis of urachal carcinoma.

Introduction

Small intestinal diverticula are rare, with an incidence of 1–2% in the general population. Although small intestinal diverticula are generally asymptomatic, they may cause serious complications, such as perforation, related to the resulting diverticulitis. Perforation of the diverticula commonly leads to peritonitis and intra-abdominal abscess formation. In rare cases, diverticulitis may perforate the abdominal wall, resulting in abdominal wall abscess without causing peritonitis. In this report, we describe a case of perforated ileal diverticulitis that caused the formation of an abdominal wall abscess below the umbilicus, resembling a urachal carcinoma.

Case presentation

A 76-year-old woman with diabetes presented with abdominal enlargement below the umbilicus. A cutaneous fistula with the purulent discharge was noted on the left side of the umbilicus. On physical examination, the patient was afebrile and presented slight abdominal tenderness. Urine analysis revealed pyuria (10–19/hpf), whereas laboratory tests revealed a slightly elevated white blood cell count (9,800/ μ L). However, levels of C-reactive protein

(0.01 mg/dL) and tumor markers (carcinoembryonic antigen, 0.50 ng/mL; cancer antigen 19–9, 6.39 U/mL; alpha-fetoprotein, 1.3 ng/mL) were within normal limits.

Computed tomography (CT) revealed a well-enhanced mass in the lower umbilical area involving the rectus abdominis muscle (Fig. 1a,b) and showed high uptake (SUV max = 16.49) on 18F-fluorodeoxyglucose positron emission tomography (FDG-PET) CT (Fig. 1c,d), suggesting malignancy. Magnetic resonance imaging (MRI) revealed that the mass was isointense on T2-weighted imaging (Fig. 2a) and hyperintense on diffusion-weighted imaging (Fig. 2b). Furthermore, the mass was connected to the restiform structure, which was supposed to be the urachus (Fig. 2c). The mass had an irregular medial surface and was connected to the small intestines; this arrangement was suspected to be an invasion of the greater omentum and small intestine (Fig. 2d). Collectively, these findings suggested a urachal carcinoma that had invaded the small intestines. Cystoscopy revealed no apparent tumor or swelling suggestive of a submucosal tumor. Additionally, the urine cytology result was class 2.

Surgical resection of the tumor was performed after urachal carcinoma was diagnosed. Subcutaneous adipose tissue around the cutaneous fistula was resected; however, no obvious neoplastic lesions were found. When the rectus abdominis muscle was divided at the midline, a hard mass was noted on the peritoneal surface. The mass adhered tightly to the ileum, at 340 cm from the ligament of Treitz; therefore, partial resection of the small intestines was performed. As the tumor did not extend to the bladder, partial resection of the bladder dome was not performed.

On pathological evaluation, the ileal mucosa was observed at the border between the tumor and the ileum (Fig. 3a) and

protruded without an accompanying muscularis propria; thus, the structure was considered as a pseudodiverticulum. Additionally, this pseudodiverticulum had been infiltrated by neutrophils and formed an abscess (Fig. 3b). There was no evidence of neoplastic lesions at any of the sites evaluated. The pathological diagnosis was abdominal wall abscess caused by perforation of an ileal diverticulum. The postoperative course was uneventful, and the patient had not experienced a recurrence of abdominal wall abscess 12 months after surgery.

Discussion

Although abdominal wall abscesses occasionally develop along the transabdominal incision after open surgery, they are rarely caused by other conditions. However, some other possible causes of abdominal wall abscess include malignant tumors,¹ acute appendicitis, gynecological disorders, Crohn's disease, colonic diverticula, cholecystitis, and intestinal perforation.² Pathological evaluation of the resected specimen in our patient suggested an abdominal wall abscess associated with diverticulitis of an ileal pseudodiverticula. As the abscess was located on the rectus abdominis muscle below the umbilicus, urachal carcinoma was suspected.

Although small intestinal diverticula are often asymptomatic, they can cause complications, including bleeding, diverticulitis, perforation, peritonitis, and intra-abdominal abscess. In rare cases, they may create an enterocutaneous fistula, resulting in an abdominal wall abscess without causing peritonitis. In the present case, only six cases of abdominal wall abscesses caused by small intestinal diverticulitis have been reported in the literature^{2–6} (Table 1). Two of these six

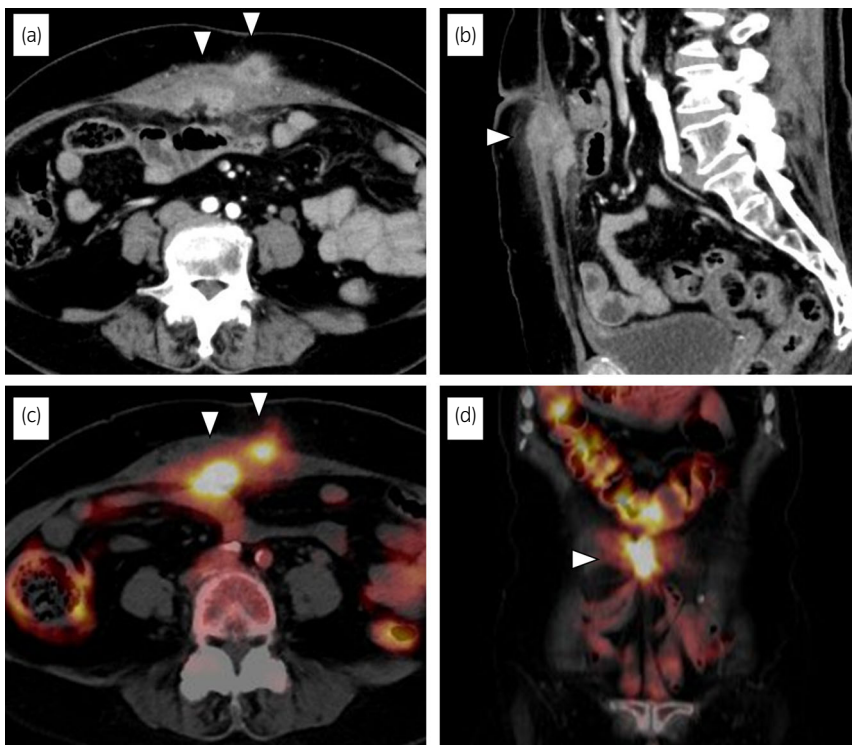


Fig. 1 Computed tomography (CT) images of the abdominal wall mass suspected to be a urachal carcinoma. (a) Axial CT image of the abdominal wall mass (arrowheads). (b) Sagittal CT image showing an abdominal wall mass (arrowhead) connected to the urachus. (c) Axial and (d) coronal 18F-fluorodeoxyglucose positron emission tomography images of the abdominal wall mass (arrowheads).

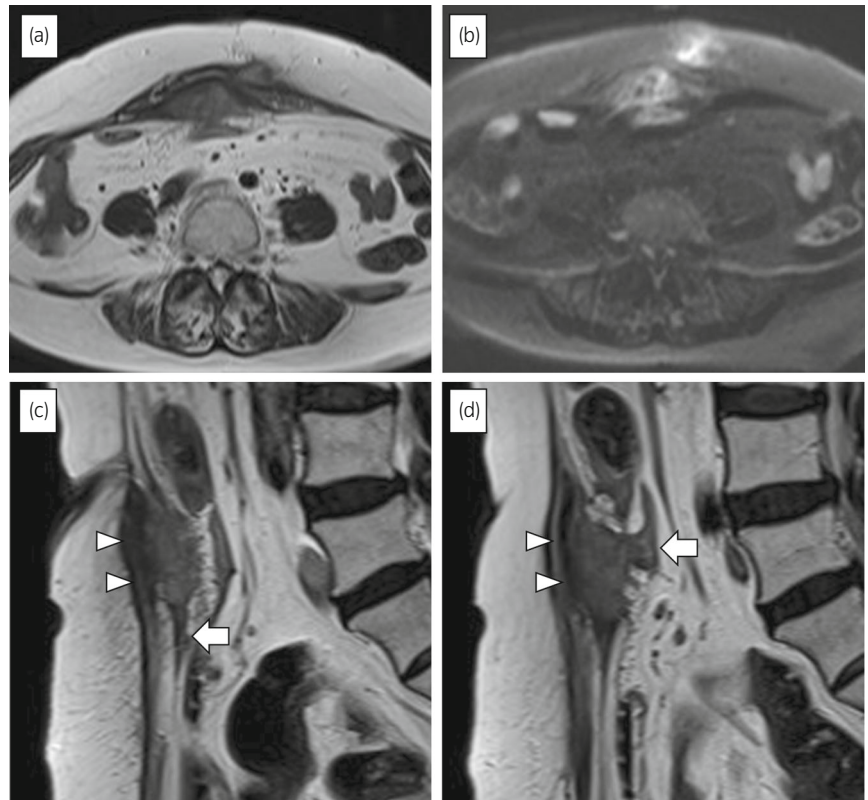


Fig. 2 Magnetic resonance images of the abdominal wall mass suspected to be a urachal carcinoma. (a) Axial T2-weighted and (b) axial diffusion-weighted images of the abdominal wall mass. Median ADC value within the tumor was $1.16 \times 10^3 \text{ mm}^2/\text{sec}$. (c) Sagittal T2-weighted image revealing the mass (arrowheads) connected to the urachus (arrow). (d) Sagittal T2-weighted image showing the mass (arrowheads) invading the small intestine (arrow).

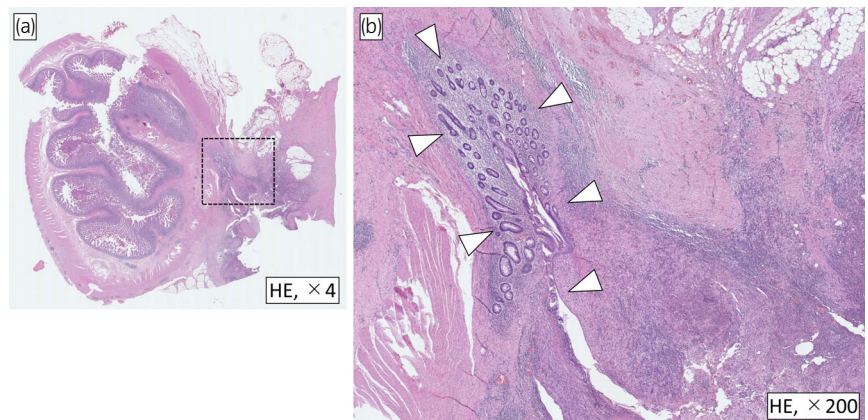


Fig. 3 Microscopic findings of the resected tumor. (a) A loupe image ($\times 4$) of the border between the abdominal wall tumor (right) and ileum (left). The ileal mucosa is observed in the area within the black dotted square, which is enlarged in the right panel (b). (b) Histopathological findings ($\times 200$) of the ileal mucosa at the margin between the tumor and the ileum. The ileal mucosa (arrowheads) protruded out of the ileal wall without an accompanying muscularis propria, suggesting that this area was a pseudodiverticulum. The pseudodiverticulum connected to the abscess that had extensive neutrophil infiltration.

Table 1 Reported cases of abdominal wall abscess caused by small intestinal diverticulitis

Author (year)	Age	Sex	Site	Location of abdominal tumor	Treatment	Cause of abdominal wall perforation	Type of diverticula
1 Alvarez OA ³ (1995)	71	Male	Jejunum	Left upper abdomen	Drainage	Adhesion caused by previous abdominal surgery	Not reported
2 Fujisawa T ⁴ (1996)	66	Male	Ileum	Right lower abdomen	Resection	Adhesion caused by previous abdominal surgery	Pseudodiverticula
3 Eriguchi N ⁵ (1997)	55	Male	Ileum	Right lower abdomen	Resection	Diverticulitis	Pseudodiverticula
4 Sakurai Y ² (2005)	53	Female	Jejunum	Left lower abdomen	Resection	Diverticulitis	Pseudodiverticula
5 Almkali MA ⁶ (2019)	65	Male	Ileum	Left lower abdomen	Resection	Adhesion caused by previous abdominal surgery	Not reported
6 Current case (2022)	76	Female	Ileum	Lower umbilical area	Resection	Diverticulitis	Pseudodiverticula

patients had jejunal diverticula, whereas the remaining four had ileal diverticula. One patient underwent drainage alone, whereas the others underwent small intestinal resection and anastomosis. Additionally, the previous five cases had an abdominal wall abscess on either side of the abdomen, whereas the present case had an abscess at the midline, which was highly indicative of a urachal carcinoma.

Perforation of small intestinal diverticula commonly leads to intra-abdominal abscess and peritonitis; hence, there may be a specific reason why diverticulitis causes localized inflammation and perforates the abdominal wall. Alvarez et al.³ have speculated that the abdominal wall abscess in their patient was caused by adhesion of the jejunal loops to the abdominal wall secondary to previous abdominal surgeries. Moreover, two other cases^{4,6} had a previous history of abdominal surgery; therefore, adhesion of the intestines to the abdominal wall may cause localized inflammation. The remaining cases,^{2,5} including the present case, did not have a history of previous surgery. We speculate that small intestinal diverticulitis caused adhesion of the small intestines to the abdominal wall in these cases, resulting in localized inflammation and perforation. In our patient, diabetes mellitus may have further played a role in the development of the abdominal wall abscess.

Intestinal diverticula are divided into true diverticula, which contain all layers of the intestinal wall, and pseudodiverticula, which are mucosal and submucosal protrusions through the muscular wall. Among the six cases of small intestinal diverticulitis causing abdominal wall abscess, four were pseudodiverticula and the remaining two were unspecified in type.

In the present case, the ileal diverticulum adhered to the lower umbilical lesion, resulting in an abdominal wall abscess resembling a urachal carcinoma on CT, MRI, and FDG-PET. Additionally, the abscess showed strong uptake on FDG-PET, suggesting malignancy. However, several previous case reports have suggested that differentiating a urachal abscess from a urachal carcinoma based on the FDG-PET findings alone is challenging.^{7,8} A strong uptake may indicate an abscess rather than a carcinoma because urachal carcinomas, particularly mucinous adenocarcinomas, may have a low FDG uptake.⁹ Urachal carcinomas mostly occur at the lower urachus near the bladder dome; hence, a lesion located at the upper urachus, as in the present case, suggests a urachal abscess rather than a urachal carcinoma.

In conclusion, an abdominal wall abscess caused by diverticulitis, although rare, should be considered as a differential diagnosis of urachal carcinoma.

Acknowledgments

None declared.

Author contributions

Naoki Imasato: Data curation; writing – original draft. Toshiaki Kijima: Conceptualization; data curation; writing – original draft; writing – review and editing. Atsuko Takada-Owada: Data curation; investigation. Junki Fujita: Data curation. Kohei Takei: Data curation. Issei Suzuki: Data curation. Daisaku Nishihara: Data curation. Takatoshi Nakamura: Data curation. Kazuyuki Ishida: Data curation; investigation. Takao Kamai: Supervision; writing – review and editing.

Conflicts of interest

The authors declare no conflict of interest.

Approval of the research protocol by an Institutional Reviewer Board

Not applicable.

Informed consent

Written informed consent was obtained from the patients for publication of this case report and accompanying images.

Registry and the Registration No. of the study/trial

Not applicable.

References

- 1 ElGendy K, Al Duhileb M, Salem A. Transverse colon cancer presenting as acute abdominal wall abscess. *BMJ Case Rep.* 2014; **2014**: bcr2014204105.
- 2 Sakurai Y, Tonomura S, Yoshida I et al. Abdominal wall abscess associated with perforated jejunal diverticulitis: report of a case. *Surg. Today* 2005; **35**: 682–6.
- 3 Alvarez OA, Mejia A, Ostrower VS, Lee M. Jejunal diverticulitis manifesting with abdominal wall abscess. *Am. J. Gastroenterol.* 1995; **90**: 2060–2.
- 4 Fujisawa T, Tomofuji Y, Kuroda N et al. Diverticulitis of the ileum with polyp-simulating mucosal prolapse. Report of a case. *Nihon Shokakibyo Gakkai Zasshi.* 1996; **93**: 481–6.
- 5 Eriguchi N, Aoyagi S, Nakayama T, Emi Y, Saku M, Yoshida K. Ileo-abdominal wall fistula caused by diverticulum of the ileum. *J. Gastroenterol.* 1998; **33**: 272–5.
- 6 Almalki MA, Yaseen WY, Baatiyyah M. Small bowel diverticulum complicated by enterocutaneous fistula and abdominal wall abscess - case report. *Int. J. Surg. Case Rep.* 2019; **57**: 39–41.
- 7 Chen YH, Tseng JS. Concurrent urachal abscess and florid cystitis glandularis masquerading as malignancy: a case report and literature review. *BMC Surg.* 2022; **22**: 105.
- 8 Dong A, Zuo C, Wang Y, Lu J, Zhu H. Organized urachal abscess mimicking urachal carcinoma on FDG PET/CT. *Clin. Nucl. Med.* 2014; **39**: 71–3.
- 9 Flaus A, Longo MG, Dematons M, Granjon D, Prevot N. 18F-FDG PET/CT in urachal abscess. *Clin. Nucl. Med.* 2019; **44**: e349–50.