



## Case Report

## Treatment of thigh abscess caused by retroperitoneal perforation of cecal cancer: A case report



Shunki Iemura<sup>a</sup>, Shigeshi Mori<sup>a</sup>, Masato Kamiya<sup>a</sup>, Kenji Yamazaki<sup>a</sup>, Takaya Kobayashi<sup>a</sup>, Masao Akagi<sup>b</sup>, Daisuke Togawa<sup>a,\*</sup>

<sup>a</sup> Departments of Orthopedics and Rheumatology, Kindai University Nara Hospital, 1248-1 Otodacho, Ikoma, Nara, 630-0293, Japan

<sup>b</sup> Department of Orthopedic Surgery, Kindai University Faculty of Medicine, 377-2 Ohnohigashi, Osakasayama, Osaka, 589-8511, Japan

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## ABSTRACT

**Introduction and importance:** Iliopsoas and iliacus abscesses are caused by hematogenous and lymphatic infections and the spread of inflammation in neighboring organs. A small number of cases have been reported in which inflammation spread not only within the iliopsoas muscle but also to the thigh. Here we report a case of retroperitoneal infiltration and perforation of cecal cancer that caused extensive abscess formation from the iliacus muscle to the thigh.

**Case presentation:** An 80-year-old man who had undergone chemotherapy for cecal cancer had abdominal pain and right thigh pain without any particular attraction. CT images showed extensive abscess formation from the iliacus muscle to the subcutaneous part of the thigh due to retroperitoneal infiltration and perforation of cecal cancer. Ileocecal resection, colostomy, and retroperitoneal abscess drainage were performed for perforation of cecal cancer and pelvic abscess. Although the thigh was initially drained by a small incision, the infection did not heal. Extensive debridement and drainage were required for all of the contaminated areas, and after all the infection was completely cured.

**Clinical discussion:** The optimal treatment for an abscess that has spread from the inguinal region to the thigh is unclear. In this case, active debridement and drainage of the infected area were effective and should have been done early.

**Conclusion:** We believed that debridement and drainage should have been performed from the time of the first surgery not only by the small incision drainage but also for all of the contaminated areas when the infection had been widespread.

## 1. Introduction

Iliopsoas and iliacus abscesses are caused by hematogenous or lymphatic spread or spread of inflammation from neighboring organs. Hematogenous or lymphatic spread of infection usually occurs in patients with chronic conditions such as diabetes mellitus, kidney disease, drug abuse, or immunosuppression. Spread of inflammation from neighboring organs occurs in patients with comorbidities such as Crohn disease, appendicitis, pancreatitis, diverticulitis, urinary tract infections, osteomyelitis of vertebral bodies, and spondylodiscitis [1–3]. Additionally, such abscesses have been reportedly been associated with ileocecal cancer [4,5]. Treatment is generally conservative, with antibacterial chemotherapy; however, surgical incision and drainage, including computed tomography (CT)-guided drainage, are often useful

[3,6]. In some cases, these abscesses spread not only into the iliopsoas, iliacus, and pelvis, but also beyond the inguinal ligament to the thigh. There is no consensus on the treatment of such extensive abscesses [7]. We here report a case of retroperitoneal infiltration and perforation of cecal cancer that caused extensive abscess formation from the iliacus muscle to the thigh. This work has been reported in line with the SCARE 2020 [8].

## 1.1. Report of the case

An 80-year-old man who had been receiving chemotherapy for cecal cancer at another hospital was referred to our hospital for abdominal pain. He reported pain, swelling, and erythema from the abdomen to the front of the right thigh. Laboratory tests revealed leukocytosis (13,000/

\* Corresponding author. Departments of Orthopaedics and Rheumatology, Kindai University Nara Hospital, 1248Otodacho, Ikoma, NARA, 630-0293, Japan.

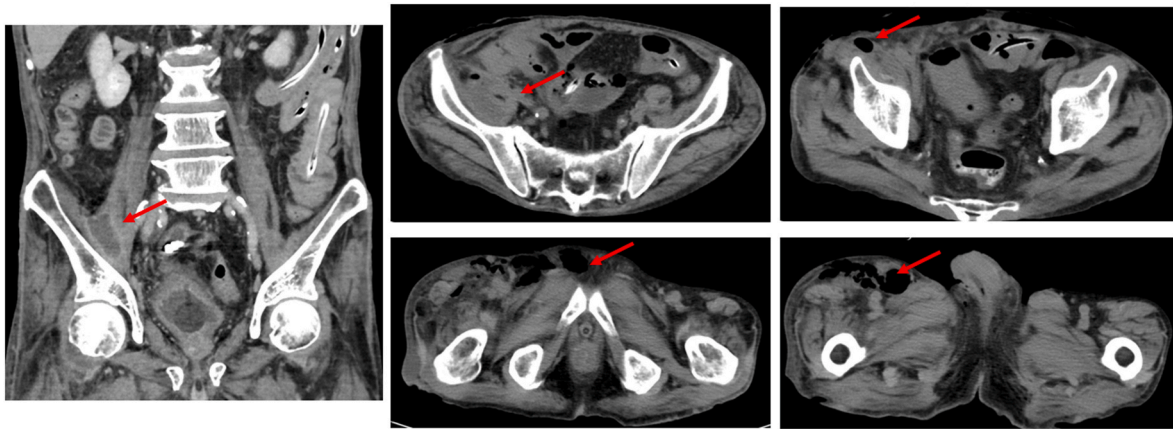
E-mail address: [togawa@med.kindai.ac.jp](mailto:togawa@med.kindai.ac.jp) (D. Togawa).

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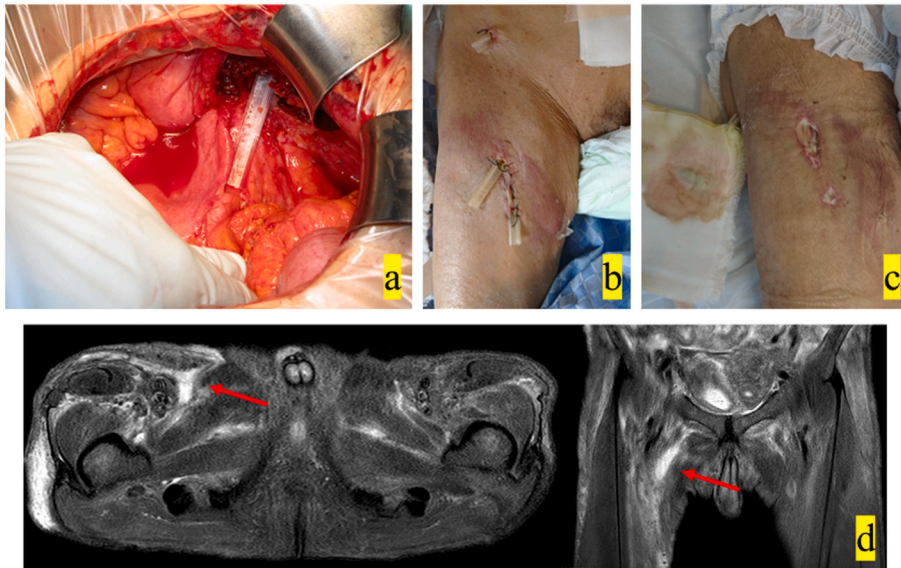
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**Fig. 1.** Computed tomography findings

Computed tomography images showing retroperitoneal infiltration of cecal cancer, an abscess around the right iliacus muscle, and an abscess and subcutaneous emphysema in the right thigh (arrows).



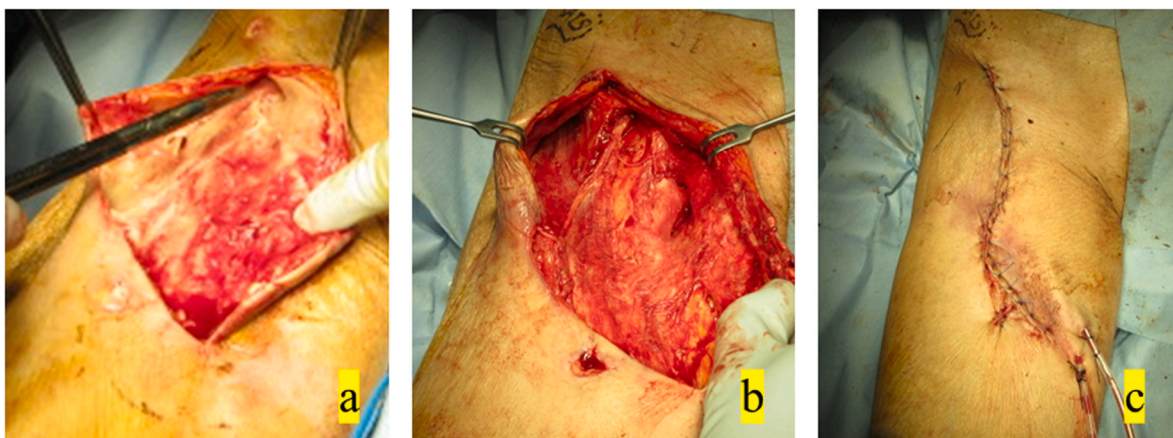
**Fig. 2.** Surgical findings and Postoperative course after the first surgery

a) Ileocecal resection, colostomy, and retroperitoneal abscess drainage were performed for perforation of cecal cancer, and a pelvic abscess

b) A small incision has been made in the right thigh and an open-drain inserted subcutaneously

c) Pus continued to flow from the drain hole after the thigh drain had been removed

d) T2-weighted magnetic resonance images showing multiple abscess cavities in the anterior subcutaneous part of the thigh (arrows).



**Fig. 3.** Second surgery

a) An incision was made in the anterior part of the thigh. Pus and necrotic tissue were observed

b) The infected part at the thigh was drained and debrided

c) A closed drain was placed in each tract.

μL) and a high C-reactive protein (CRP) concentration (39.6 mg/dL). A CT scan revealed retroperitoneal infiltration by cecal cancer, an abscess around the right iliopsoas muscle, and an abscess and subcutaneous emphysema in the right thigh (Fig. 1). His past histories were hepatitis type B and prostate cancer. There is no special record in the family medical history.

### 1.2. Treatment

Treatment with conservative therapy only, including administration of antibiotics, was ineffective.

Ileocecal resection, colostomy, and retroperitoneal abscess drainage were therefore performed for a perforated cecal cancer and pelvic abscess. For the thigh abscess, an open drain was inserted subcutaneously through a small incision (Fig. 2a). *Escherichia coli* was detected by pus culture. Postoperative antibiotic therapy (MEPM 3g/day, LVFX 500mg/day) resulted in resolution of the intra-abdominal infection; however, a large amount of pus continued to drain from the thigh incision (Fig. 2b). Even after the thigh drain had been removed, pus continued to drain from the hole and the wound did not close (Fig. 2c). Magnetic resonance imaging revealed multiple abscess cavities in the anterior subcutaneous part of the thigh and laboratory tests showed the CRP concentration had again increased (Fig. 2d).

Accordingly, reoperation was performed 15 days after the initial surgery. In this procedure, an incision was made in the anterior part of the thigh, and drainage and debridement performed. Abscess outflow tracts were identified between the sartorius and iliopsoas muscles and from the inner edge of the neurovascular bundle toward the inguinal ligament. A closed drain was placed in each tract (Fig. 3a,b,c) and antibiotic therapy (CTRX 2g/day, LVFX 500mg/day) were continued. Suction drainage for 1 week postoperatively achieved wound healing. One month after the first surgery, his CRP concentration returned to within the normal range and there was no evidence of abscess recurrence. After the second surgery, CTRX ended in two weeks and continued LVFX for a month.

## 2. Discussion

We here report a case of subcutaneous abscess of the thigh associated with an iliopsoas abscess. Some iliopsoas abscesses resulting from adhesion or perforation of malignant tumor to the retroperitoneum have been reported [4,9]. Although they are relatively rare, orthopedists may encounter similar cases [4].

Iliopsoas abscesses are generally managed conservatively with antibacterial chemotherapy. However, when these abscesses have resulted from malignant tumor infiltration or gastrointestinal perforation, or when the infection has spread to the thigh, as in this case, management by conservative treatment alone may be ineffective.

Furthermore, although surgery is considered to be the treatment of choice for pelvic abscesses and the underlying disease, the optimal treatment for an abscess that has spread from the inguinal region to the thigh is unclear.

There are few reports of such infection spreading to the thigh; those that do are believed to reach the thigh via the iliopsoas and pectineus muscles [5]. In addition, because they spread to both the iliopsoas muscle and its surroundings, inflammation may spread to the thigh, causing longitudinal and subcutaneous emphysema in the chest and neck [5,10]. Reported infections of the thigh have been managed by debridement and incisions in both the pelvis and infected part of the thigh [7,11]. Thigh abscesses caused by an abscess in the pelvis above the inguinal ligament are usually not treated by incision and drainage, not only because sufficient drainage cannot be achieved, but also because of the risk of intestinal fistula formation. Delayed treatment can reportedly result in such an abscess spreading to the lower leg and the need for a flap after debridement; thus, prompt diagnosis and timely appropriate treatment are required [12].

During the second operation on the present case, outflow tracts from the abscess were identified near the sartorius muscle and neurovascular bundle. The approach was from the distal side, minimizing the risk of complications. Given the outcome of the first surgery, we believe that not only should small incisions be made, but contaminated areas of the thigh should also be incised and active debridement and drainage implemented.

Although active debridement and drainage are of course necessary, there are femoral nerves and arteries and veins in front of the thigh, which may be damaged by surgery. In case the infection becomes widespread, the surgical invasion will increase, thus surgical treatment may be hesitant. The condition of this case is not frequently encountered, and there is no established treatment yet, but there is a great possibility that the iliopsoas abscess will spread to the lower limbs. Further treatment strategies need to be considered.

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None.

### Ethical approval

The patient was informed, and we have acquired his consent for this publication.

### Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

### Author contributions

S-I: writing the paper.  
S-M: surgical treatment for this patient.  
M-A: study design.  
D-T: data interpretation.  
M-K, K-Y, T-K: patient care.

### Registration of research studies

1. Name of the registry:
2. Unique Identifying number or registration ID:
3. Hyperlink to your specific registration (must be publicly accessible and will be checked):

### Guarantor

Daisuke Togawa, MD, PhD is the guarantor for this paper.

### Provenance and peer review

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### Declaration of competing interest

None.

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