

## Successful Percutaneous Ultrasound-guided Drainage for Treatment of a Splenic Abscess

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### Abstract

We report a case of splenic abscess that was successfully treated with percutaneous ultrasound-guided drainage and without splenectomy. A 40-year-old woman was admitted to Nippon Medical School Hospital because of pyrexia and left upper quadrant pain, which had persisted despite antibiotic treatment. On admission, computed tomography demonstrated a low-density area in the spleen, which had been seen on computed tomography 3 months earlier. Ultrasonography demonstrated a hypoechoic area in the spleen. Initial laboratory tests revealed a serum C-reactive protein concentration of 19.7 mg/dl and a white blood cell count of 15,800 / $\mu$ l. The serum glucose concentration was 267 mg/dl, and the glycolated hemoglobin value was 7.7%. A splenic abscess was diagnosed and was treated with percutaneous drainage. Milky yellow fluid was obtained, and the patient's left upper quadrant abdominal pain and pyrexia resolved. A culture of the drainage fluid yielded *Escherichia coli*. The drainage catheter was removed 12 days after insertion. The patient was discharged 6 days later. The splenic abscess has not recurred during 3 months of follow-up. Our results suggest that ultrasound-guided percutaneous drainage is a safe and effective alternative to surgery for the treatment of splenic abscess and allows preservation of the spleen.

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**Key words:** splenic abscess, percutaneous drainage, spleen preservation, diabetes

### Introduction

Splenic abscess is an uncommon condition with a high mortality rate due to delayed detection and treatment<sup>1–3</sup>. Recently, the advent of computed tomography (CT) and ultrasonography has enabled splenic abscesses to be promptly diagnosed, if patients suspected to have abscesses because of

vague left upper quadrant symptoms, fever, or both are referred to the appropriate department for further evaluation<sup>4–8</sup>. The rising prevalence of immunocompromised patients in the general population has increased the incidence of splenic abscesses<sup>9</sup>. Although antibiotics and splenectomy<sup>2,4,10,11</sup> have traditionally been considered the treatments of choice, the need for splenectomy has been questioned because the spleen is believed to have

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important immunologic functions<sup>12-14</sup>. The development of interventional radiology has dramatically changed the management of solid and cystic masses in the abdomen. Abscesses of the abdomen, pelvis, and retroperitoneum, as well as pancreatic pseudocysts, can be readily drained with a percutaneous catheter<sup>4,7,8</sup>. We report a case of splenic abscess successfully treated by percutaneous ultrasound-guided drainage, thereby avoiding splenectomy.

### Case Report

A 40-year-old woman was admitted to Nippon Medical School Hospital because of pyrexia and left upper quadrant pain, which had persisted for 5 days despite antibiotic treatment at another hospital. The medical history was not relevant to the current illness. Three months earlier, the patient had gone to another hospital because of left upper quadrant abdominal pain with no evidence of contusion. Abdominal CT revealed fatty changes in the liver, a gallbladder stone without inflammatory changes, and a normal spleen (**Fig. 1a**). Twenty days earlier, she had gone again to the same hospital because of pyrexia and left upper quadrant abdominal pain. Five days earlier, she was admitted to that hospital because of severe pyrexia. Despite treatment, pyrexia persisted, and the patient was referred and admitted to our hospital.

On admission, CT demonstrated a low-density area in the spleen, which was not seen on a CT scan obtained 3 months previously. The fatty changes in the liver and the gallbladder stone were unchanged (**Fig. 1b**). Ultrasonography demonstrated a hypoechoic area in the spleen (**Fig. 2**). Initial laboratory tests revealed the following: aspartate aminotransferase, 7 IU/L (normal, <28 IU/L); alanine aminotransferase, 7 IU/L (normal, <33 IU/L); ALP, 424 IU/L (normal 66 to 220 IU/L); lactic dehydrogenase, 186 IU/L (normal, 180 to 460 IU/L);  $\gamma$  glutamyl transpeptidase, 120 IU/L (normal, 8 to 39 IU/L); C-reactive protein, 19.7 mg/dl (normal, <0.3 mg/dl); white blood cell count, 15,800 / $\mu$ l (normal, 4,000 to 8,000 / $\mu$ l); erythrocyte count,  $381 \times 10^4$  / $\mu$ l (normal,  $410$  to  $550 \times 10^4$  / $\mu$ l); hemoglobin, 8.0 g/dl

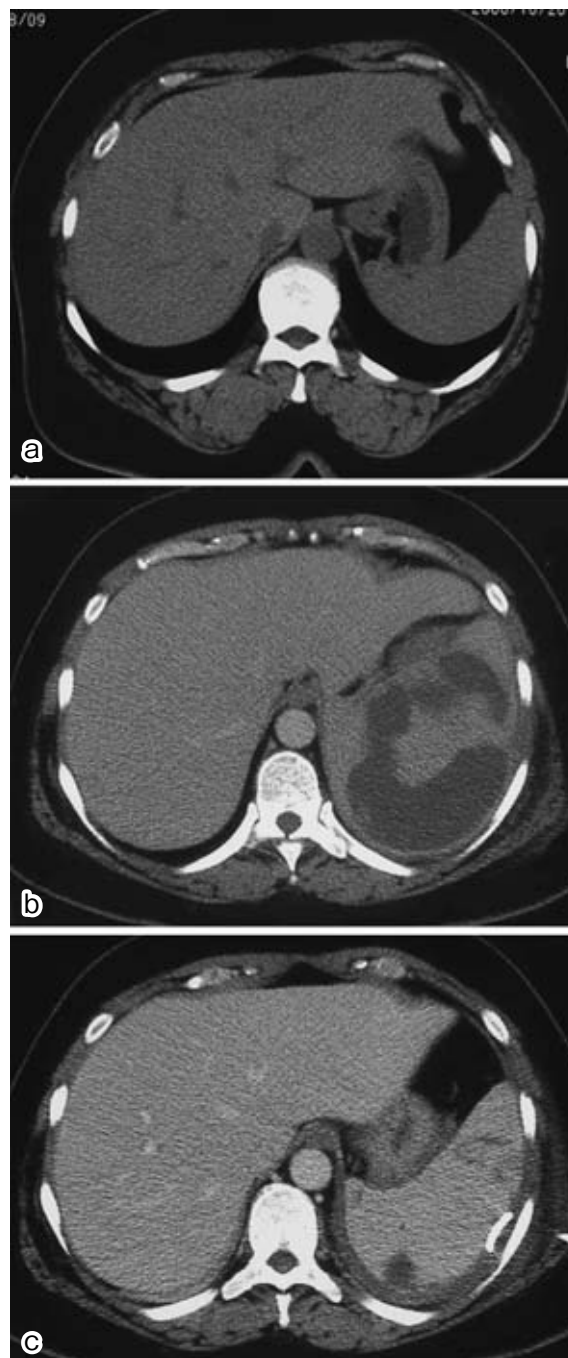


Fig. 1 **a**: Three months earlier, abdominal CT revealed a normal spleen. **b**: On admission, CT demonstrated a low-density area in the spleen. **c**: Eleven days after drainage, CT showed that the low-density area had shrunk.

(normal, 14 to 18 g/dl); and platelet count, 584,000 / $\mu$ l (normal 200,000 to 400,000 / $\mu$ l). The serum glucose concentration was 267 mg/dl (normal, 80 to 120 mg/dl) and the glycolated hemoglobin value was 7.7% (normal <4.1% to 5.9%).



Fig. 2 On admission, ultrasonography demonstrated a hypoechoic area in the spleen.

A splenic abscess was diagnosed and treated by percutaneous drainage with an 8-French pigtail catheter. Milky yellow fluid was obtained, and the patient's left upper quadrant abdominal pain and pyrexia resolved. A culture of the drainage fluid yielded *Escherichia coli*. Eleven days after drainage, CT showed that the low-density area had shrunk (**Fig. 1c**). Anemia was caused by a uterine myoma, confirmed on pelvic CT. The C-reactive protein level was 0.91 mg/dl, and the white blood cell count was 7,400 / $\mu$ l. The drainage catheter was removed 12 days after insertion. The patient was discharged 6 days later. The splenic abscess has not recurred during 3 months of follow-up.

### Discussion

Splenic abscess is a rare condition with a prevalence of 0.14% to 0.7% in autopsy series<sup>1-3</sup>. It often presents with either vague or nonspecific signs and symptoms, making clinical diagnosis difficult. Currently available imaging techniques enable early diagnosis. Splenic abscesses often develop in patients with underlying diseases<sup>1,4,10,15</sup>. Metastatic infections are associated with approximately two-thirds of all splenic abscesses, with endocarditis and secondary bacterial seeding of the spleen the next most common causes. The cause of the splenic abscess in our patient was unknown. Exogenous steroids or

conditions that predispose to immunosuppression, such as diabetes and alcoholism, are often underlying contributing factors<sup>4,7,10,16-18</sup>. In our patient, untreated diabetes was detected after admission.

Zerem et al.<sup>19</sup> have reported that Gram-negative bacilli are the leading cause of splenic abscess. *Klebsiella pneumoniae* is the most frequently found pathogen. Some previous studies have obtained similar results<sup>1</sup>, but others have reported different findings (mainly streptococcus, salmonella, *E. coli*, and staphylococcus species)<sup>4,10,11,20</sup>. In our patient, a culture of drainage fluid yielded *E. coli*.

In the past, antibiotic therapy and splenectomy were considered the treatments of choice for splenic abscess<sup>21</sup>. The spleen is important for proper immunologic function, and splenectomy increases the risk of postoperative infections. Recently, splenic abscesses have been successfully managed by medical treatment and percutaneous imaging-guided drainage, with preservation of the spleen<sup>12-14,22-24</sup>. The duration of hospitalization is much longer for patients who required rescue splenectomy than for patients who underwent splenectomy initially (32.6 versus 17.5 days). However, rescue splenectomy is not associated with an increase in mortality: thus, initial treatment by percutaneous drainage might be a reasonable strategy<sup>20,25</sup>. Percutaneous drainage guided with CT or sonography decreases morbidity, preserves immune function, and is less invasive than open surgery<sup>6,7,26-29</sup>.

Percutaneous treatment is particularly indicated for critically ill postoperative patients or for patients in whom general anesthesia, surgical drainage, or splenectomy pose substantial risks. Zerem et al.<sup>19</sup> have recommend needle aspiration primarily for splenic abscesses less than 50 mm in greatest diameter and continuous percutaneous drainage for abscesses larger than 50 mm and for bilocular abscesses. Because the splenic abscess in our patient was more than 50 mm in greater diameter, we performed percutaneous drainage. Complications associated with percutaneous drainage of splenic abscesses include hemorrhage, pleural empyema, pneumothorax, and fistula formation<sup>13,30</sup>. These complications are rare if high-risk patients are excluded. The splenic abscess in our patient was

successfully drained with no complications. Our results suggest that ultrasound-guided percutaneous drainage is a safe and effective alternative to surgery for the treatment of splenic abscesses and allows preservation of the spleen.

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