

## CASE REPORT

# Splenic abscess due to *Salmonella schwarzengrund* in a previously healthy individual returning from Bali

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**SUMMARY**

After an episode of diarrhoea, a previously healthy young man developed a splenic abscess due to invasive non-typhoidal *Salmonella*. The patient was presented with >1 month of fever, diffuse abdominal pain, raised C reactive protein and increased white cell count. Ultrasonography revealed a 5×5 cm abscess in the spleen. After an unsuccessful treatment attempt with percutaneous drainage and antibiotics, the patient was successfully treated with splenectomy and antibiotics. This case highlights the difficulties inherent in making a correct diagnosis of splenic abscess in patients without risk factors. Splenic abscess is rare in previously healthy individuals. Antibiotics are inadequate as a sole treatment, and percutaneous drainage is usually only a temporary solution. Splenectomy is still the standard treatment in most cases.

**BACKGROUND**

This case shows that previously healthy individuals can contract invasive non-typhoidal *Salmonella* (NTS) infections with development of abscesses in the spleen. Both these complications of *Salmonella* gastroenteritis/infection have previously been reported mainly in patients with underlying illnesses such as immunodeficiency or anatomical abnormalities of the spleen. It also highlights the difficulties inherent in making a correct diagnosis of splenic abscess in an emergency room (ER).

**CASE PRESENTATION**

A previously healthy young man presented to the ER after 13 days of 3–4 bouts of watery diarrhoea per day, non-specific abdominal pain, fever and anorexia, after visiting Bali. All of his travelling companions had had the same symptoms, but all of them recovered. Blood samplings were normal except for 26 mm erythrocyte sedimentation rate (ESR, normal value 2–13 mm), 127 mg/L C reactive protein (CRP, normal value <5 mg/L), 1.5 µkat/L aspartate aminotransferase (normal value 0.25–0.75 µkat/L), 1.4 µkat/L alanine aminotransferase (normal value 0.15–1.10 µkat/L) and 1.4 µkat/L glutamyl transferase (GT, normal value 0.15–1.30 µkat/L). Faeces cultures were normal. The patient was referred to a healthcare centre for follow-up.

The patient re-presented to the ER 12 days later. The diarrhoea had stopped, but he had developed pain in the left portion of the abdomen. Abdominal examination revealed a slight tenderness in the left portion of the abdomen. Blood samplings revealed white cell count (WCC)  $13.5 \times 10^9/L$  (normal value  $3.5\text{--}9.0 \times 10^9/L$ ),  $397 \times 10^9$  platelets/L (normal

value  $150\text{--}350 \times 10^9/L$ ) and 50 mg/L CRP. The patient's symptoms were interpreted as either sensitive bowel after infectious diarrhoea, or a new mild infection. The patient was sent home. That same night, the patient returned after developing dyspnoea and discomfort in the left lumbar area when taking deep breaths. Vital parameters and blood sampling were normal except for WCC  $12 \times 10^9/L$  and 76 mg/L CRP. A thoracic CT scan was performed due to suspicion of pulmonary embolism; this revealed a small disk atelectasis by the left pleural sinus.

At the healthcare centre, 11 days later, the pain in the left upper quadrant was unchanged, and the patient had had intermittent fever of 39–40°C (2–3 days with fever, 2–3 days without fever) for the past month. CRP was 112 mg/L. The patient was referred to the department of infectious diseases for investigation of fever of unknown origin.

At the department of infectious diseases, the abdominal examination was unchanged, blood samplings showed WCC  $10.8 \times 10^9/L$ ,  $1.29 \times 10^9$  monocytes/L (normal value  $0.1\text{--}0.8 \times 10^9/L$ ), 46 mm ESR, 179 mg/L CRP and 2.5 µkat/L GT. Chest X-ray, blood serologies, cultures from the nasopharynx, urine, sputum and blood were normal. Ultrasonography (USG) of the abdomen showed a 5×5 cm suspected abscess in the spleen and a haemangioma in the liver. The abscess was punctured with USG guidance and 30 mL of pus aspirated. A 3×1.5 cm abscess was left. The patient was given 1 g of meropenem 3 times/day.

Cultures showed growth of *Salmonella schwarzengrund* that was sensitive to ceftazidime, ceftibuten, cefotaxime, imipenem, meropenem, tobramycin and piperacillin/tazobactam, and resistant to amoxicillin, clarithromycin, ciprofloxacin and trimethoprim/sulfamethoxazole. Blood samples showed decreasing CRP and WCC. The antibiotic regime was changed to ceftriaxone.

The patient once again had a fever and rising CRP. USG showed an abscess as large as before the puncture. The patient underwent laparoscopic splenectomy. Ceftriaxone was changed to imipenem/cilastatin due to leakage of pus into the abdomen and subsequent peritonitis. The antibiotic was later changed to ceftibuten. Blood samples showed thrombocytosis. The patient felt better and was discharged.

**OUTCOME AND FOLLOW-UP**

At follow-up 7 weeks postoperation, the patient had fully recovered and antibiotics were discontinued. CRP and ESR were normal.



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## DISCUSSION

NTS infection usually gives rise to a self-limited gastroenteritis that does not require antibiotics unless the patient is immunocompromised.<sup>1</sup> NTS infections have a broad host range and are frequently zoonotic. Invasive NTS is rare in industrialised parts of the world, and studies show an incidence of 1.02/100 000 population.<sup>2</sup> Extraintestinal complications occur in 4% of cases.<sup>3</sup> Individuals with comorbidities such as HIV, malignancy, diabetes mellitus and other causes of immunodeficiency are at higher risk of bacteraemia and subsequent extraintestinal disease.<sup>2,4</sup> Approximately 5% of individuals with NTS gastroenteritis will develop bacteraemia, a serious complication with a death rate of 16%.<sup>5</sup> *Salmonella* can cause endocarditis, pericarditis, arterial infection, abdominal infection, soft tissue infection, urinary tract infection, genital infection, pneumonia, empyema, meningitis, septic arthritis and osteomyelitis.<sup>6</sup>

Splenic abscesses are rare; in a Danish study, the incidence was 0.056% per 1000 somatic hospital discharges,<sup>7</sup> and other studies report incidences of 0.14–0.7%.<sup>8</sup> Owing to the rarity, most of what is known is based on case studies or studies at individual institutions. The symptoms are typically fever (82–90.8%), leucocytosis (83%), left upper quadrant pain (49.8%), splenomegaly (30.7%), nausea and/or vomiting (46%) and left pleural effusion (22.3%).<sup>8,9</sup> The overall mortality is 12.4%.<sup>8</sup> *Salmonella* causes 15% of splenic abscesses and predisposing factors are splenic cysts or haemangiomas, splenic haematomas, trauma and *Salmonella* endocarditis, in addition to an immunocompromised status. Other common pathogens are *Klebsiella pneumoniae*, staphylococci, streptococci and *Escherichia coli*. *Mycobacterium* and fungi can be found in immunosuppressed individuals.<sup>6,8,10</sup> It is important to have cultures from both blood and pus, since the organism only matches in 24% of cases. CT scan is the most sensitive (96%) modality for imaging studies of splenic abscesses. USG has a sensitivity of 75–90%.<sup>8</sup>

Since antibiotics treatment by itself in most cases is inadequate, it is often combined with surgical treatments such as splenectomy or percutaneous drainage.<sup>8,9</sup> Splenectomy combined with antibiotics is the most common and most accepted standard treatment.<sup>8,9,11</sup> Percutaneous drainage is theoretically favourable, since the immunological function of the spleen is preserved. This technique is best used when there are unilocular or bilocular abscesses, since multilocular abscesses are not sufficiently treated.<sup>9</sup> Percutaneous drainage is mainly a good option in patients who are unable to undergo surgery, or as a temporary solution for a larger abscess.<sup>12</sup>

In conclusion, invasive NTS infections and splenic abscesses are most common in patients with underlying disease or anatomical abnormalities of the spleen. We present the case of a

patient without any risk factors for this kind of disease. He was treated successfully with antibiotics and splenectomy. Our experience confirms that splenic abscess should be a differential diagnosis even if the likelihood at first seems low.

## Learning points

- ▶ Invasive non-typhoidal *Salmonella* infections and splenic abscesses are most common in patients with underlying disease or anatomical abnormalities of the spleen, but previously healthy individuals can also develop these complications.
- ▶ The standard treatment for splenic abscesses is a combination of antibiotics and splenectomy.
- ▶ Splenic abscess should be a differential diagnosis at the emergency room, even if the likelihood at first seems low.

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**Patient consent** Obtained.

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