CASE REPORT

A man from South Asia presenting with abdominal pain

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SUMMARY

The diagnosis of abdominal tuberculosis (TB) is challenging due to the non-specific clinical presentation and frequent failure to detect the pathogen. A young Bangladeshi man presented to the Emergency Outpatient department with constipation and burning abdominal pain that was localised primarily in the epigastrium. Although the infectious agent was not detected, findings of histological examination were helpful in guiding the treatment strategy. As a good clinical practice, it is important to consider abdominal TB as a possible diagnosis in such cases, particularly when a patient has previously been residing in a high TB burden country. Thus, appropriate diagnosis and early antituberculous therapy are essential for achieving a positive outcome.

BACKGROUND

The incidence of tuberculosis (TB) has again been increasing in developed countries, due to the rise in tourism, educational exchange activities, influx of immigrants, HIV infection and frequent use of immunosuppressive therapy. In Japan, extrapulmonary TB cases account for 23% of all TB cases.¹ However, among foreigners who stay beyond their visa validity, this proportion reaches 35%, and most of these cases consist of young men from Southeast Asia.² Despite the efforts of public health centres to screen foreigners, most of the patients seek healthcare only when severe symptoms develop, primarily due to their illegal status, language barrier or concern regarding the high medical costs. As abdominal TB can mimic various gastrointestinal disorders, it is important to consider this condition when performing differential diagnosis in patients with acute abdomen, particularly in cases of overstaying foreigners. The failure in detecting the pathogen often delays diagnosis and appropriate treatment. Although advanced medical imaging techniques and exploratory laparoscopy facilitate the diagnosis of this condition, histological findings also appear to play a vital role in the final treatment decision.

CASE PRESENTATION

A 29-year-old Bangladeshi man presented to the emergency outpatient department with a 1-week history of constipation, and burning abdominal pain that was localised primarily in the epigastrium. The patient had developed hepatitis A 4 years previously, but had no other remarkable medical or surgical history.

On examination, the patient was alert, but had an agonised look and experienced excessive

sweating. His temperature was 38.3°C, pulse rate was 93 bpm and blood pressure was 111/69 mm Hg. An abdominal examination indicated a slightly tender and distended abdomen, but no rebound tenderness was observed. The bowel sounds were slightly accelerated. An abdominal radiograph obtained in the standing position indicated the presence of small bowel gas with niveau formation and stomach expansion; however, no abdominal free gas was detected. The loss of the right psoas shadow, flank stripe sign and dog ear sign suggested the presence of acute abdomen with ascites (figure 1A). However, his chest radiograph demonstrated a raised diaphragm on both sides and basal pleural fluid accumulation (figure 1B).

Although he was administered scopolamine butylbromide and a proton pump inhibitor as a palliative treatment, he experienced continuous abdominal pain, fever, appetite loss and suspected peritonitis, and was admitted to the department of gastroenterology on the subsequent day. Thereafter, fluid replacement, antipyretics, analgesics and anti-inflammatory agents were administered.

INVESTIGATIONS

Laboratory examination indicated elevated C reactive protein and serum amyloid A levels. However, no abnormal findings were noted on gastrointestinal fibroscopy or colonoscopy. Blood, sputum, stool, urine, ascites and pleural fluid cultures yielded negative results for the presence of standard aerobic and anaerobic bacteria, acid-fast bacteria and fungi. Positive results were obtained on examination with a Quantiferon TB Gold test (QFT), but negative results were obtained for *Mycobacterium tuberculosis* (MTB) on PCR testing of 3-day sputum. The patient was screened for HIV, but a negative result was obtained. Pleural effusion, ascites retention and remarkable lymph node enlargement were observed around the coeliac and common hepatic arteries on chest and abdominal CT. Since the levels of inflammatory markers did not decrease and abdominal infection was suspected, the patient was administered cefazopran and biapenem. To investigate the characteristics of the enlarged lymph nodes, a whole body ¹⁸F-fluorodeoxyglucose positron emission/CT scan was performed, which showed accumulation of ¹⁸F-fluorodeoxyglucose along the pleura, mesentrium, small intestine, liver surface and abdominal aorta (figure 1C). In order to differentiate between the presence of malignancy and inflammatory lesions, an exploratory laparoscopy was performed on the following day. The abdominal cavity was

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Figure 1 Abdominal radiograph showing small bowel gas with niveau formation, stomach expansion, loss of right psoas shadow (white arrows indicate left psoas shadow), flank stripe sign (double line arrows) and dog ear sign (black arrows) (A). Chest radiograph showing raised diaphragm on both sides and basal pleural fluid accumulation (B). ^{18}F -fluorodeoxyglucose positron emission tomography/CT image revealing accumulation of ^{18}F -fluorodeoxyglucose along the pleura, mesenterium, small intestine, liver surface and abdominal aorta (C). H&E staining of laparoscopic specimen showing epithelioid granulomas with central necrosis and multinucleate giant cells (black arrow) (D).

filled with ascites, and bean-sized nodules were diffusely observed in the great omentum. A peritoneal biopsy indicated epithelioid granulomas with central necrosis and multinucleate giant cells (figure 1D); however, Ziehl-Neelsen staining and PCR examination of the peritoneal tissue yielded a negative result for MTB. Although we did not have definitive evidence of TB, we suspected the presence of tuberculous peritonitis, and the patient was therefore transferred to the infectious disease department.

TREATMENT

At that department, he was administrated anti-TB treatment comprising rifampicin, isoniazid, ethambutol and pyrazinamide. On initiation of anti-TB treatment, massive left-sided pleural fluid accumulation developed, and as the patient experienced problems in breathing, pleural aspiration was repeatedly performed. The lymphocyte-predominant exudate had the following parameters: adenosine deaminase, 46.9 U/L; glucose, 110 mg/dL; carbohydrate antigen (CA)-125, 638 U/mL; CA-199, 7.9 U/mL and pleural fluid lactate dehydrogenase (LDH) to serum LDH ratio, 0.7, indicating that the exudate was a result of TB infection. The transient worsening of the patient's condition was due to paradoxical aggravation, which is occasionally observed during anti-TB therapy. Despite the temporal pleural fluid accumulation, the anti-TB treatment was continued. As the patient did not have any previous respiratory problems and chest radiograph findings were not suggestive of pulmonary TB, we assumed that the pleural effusion was caused by the passage of the ascites across the diaphragm.

OUTCOME AND FOLLOW-UP

After 5 weeks of hospitalisation in the infectious disease department, the patient exhibited clinical improvement, and a chest radiograph and abdominal CT showed extensive consolidation. The patient was discharged from the hospital, and completed the 6-month regimen of oral antimycobacterials without any re-emergence.

DISCUSSION

MTB infection of the gastrointestinal tract accounts for 2% of TB cases worldwide³ and is usually underestimated in counties with a low TB prevalence. Peritoneal TB is caused by the haematogenous or lymphatic spread of MTB, ingestion of infected sputum or via direct extension from adjacent organs. This often results in the formation of multiple tuberculous granulomas, fibrosis, strictures, mesenteric lymph node enlargement and ascites.⁴ The pathological changes may manifest as acute or chronic symptoms including fever, abdominal pain, diarrhoea or constipation, weight loss, anorexia and malaise. On admission, our patient had fever and, non-specific abdominal symptoms and the abdominal radiograph did not show acute ileus; therefore, the patient underwent conservative treatment.

A positive result in the QFT assay was an important indication in the diagnosis of MTB infection. Concomitant pulmonary TB has been detected in approximately 20% of patients with abdominal TB,⁵ and immunosuppressive conditions such as HIV increase the risk of developing extrapulmonary TB.⁶ In the present case, because the patient exhibited negative results on HIV testing, had no history of TB, and had no radiological evidence of TB, and since the QFT does not distinguish between

latent and active TB infection, we suspected the presence of an MTB infection, although we were unable to confirm that it was responsible for the patient's illness. Owing to the frequent false-negative results obtained, the QFT assay is mainly a supportive test of latent and active TB diagnosis. Therefore, even if our patient exhibited negative results on QFT, the diagnostic strategy would not have been different; however, the initiation of appropriate antituberculous treatment may have been delayed.

Another negative aspect, which hindered the diagnosis, was the failure to detect the pathogen even by the sensitive PCR method. In most cases, the diagnosis of abdominal TB requires an invasive approach, and obtaining histological material is vital for correct diagnosis. Finally, the diagnosis of abdominal TB was made based on the detection of histopathological indicators of TB-epithelioid granulomas with caseation and the presence of giant cells. A study conducted in India, describing the utility of PCR and histopathological examination in abdominal TB diagnosis, showed that 22% of patients with histologically verified TB granulomas had negative results on PCR testing, and the same proportion of patients with abdominal TB had negative results on PCR and histological examination.⁷ However, the limitations of histological examination include obtaining an appropriate quality and size of the specimen, since repeating the invasive laparoscopy should be avoided.

In the differential diagnosis of abdominal TB, other granulomatous diseases should be considered, such as *Histoplasma* or *Pneumocystis* infection, Crohn's disease, sarcoidosis, Whipple's disease, mesenteric panniculitis or the formation of granulomas around foreign materials. Moreover, in elderly patients, carcinomatosis should be considered.

In the present case, we decided to administer anti-TB treatment based on the histological findings, which were supported by positive results on the QFT assay and the characteristics of the pleural fluid. However, in cases of suspected abdominal TB, even in cases where the pathogen is not confirmed, empirical anti-TB treatment should be considered. In such cases, a positive clinical outcome will represent indirect evidence that TB was present.

Learning points

- ▶ Clinicians should consider abdominal tuberculosis (TB) as a differential diagnosis, particularly in patients with abdominal pain who have previously resided in a high TB burden country.
- ▶ Advanced medical imaging techniques and exploratory laparoscopy may facilitate the diagnosis; however, histological findings may provide clues towards an appropriate treatment decision.
- ▶ In cases of suspected abdominal TB, even in cases where the pathogen is not confirmed, empirical anti-TB treatment should be considered.

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Competing interests None.

Patient consent Obtained.

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