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Diagnosis of Tuberculous Peritonitis

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ABSTRACT

The diagnosis of tuberculous peritonitis may be difficult and elusive. The patient may present with non-specific symptoms of fever, general ill-health or vague abdominal pains. There may be no pulmonary symptoms and the chest X-ray may be normal. The CT scan of the abdomen is sometimes helpful in suggesting the diagnosis. We have found that laparoscopic examination of the abdominal contents and the peritoneum is an effective way to obtain a conclusive diagnosis.

Keywords: tuberculous peritonitis, laparascopy CT scan

CASE REPORT

Although abdominal tuberculosis is now a rare disease in industrialised countries because of improved standards of living and health, pasteurisation programs, and the advent of newer effective anti-tuberculous drugs, it is still seen in many developing countries. It must therefore be considered in the differential diagnosis of patients presenting with fever and non-specific abdominal symptoms. Abdominal tuberculosis may present either as the intestinal form or as tuberculous peritonitis. The intestinal form is frequently encountered in the differential diagnosis of an acute abdomen, either due to gastrointestinal obstruction, perforation, simulating an acute appendicitis or as a palpable mass. Often, the diagnosis is made at laparotomy. At other times, chronic tuberculous inflammatory disease of the small bowel may lead to chronic diarrhoea and malabsorption. On the other hand, tuberculous peritonitis is more insidious and gradual in onset with vague complaints of fever, abdominal pains, weight loss, anorexia, lethargy or change in bowel habit. The diagnosis can be elusive and it is essential to obtain confirmatory evidence before initiating therapy. We describe 4 patients in whom the diagnosis of tuberculous peritonitis was only made after laparoscopy. Other investigations had been inconclusive. In all the 4 patients, there were suspicious radiological appearances which indicated an abdominal pathology. The findings at laparoscopy were characteristic; histological confirmation and response to therapy led to a conclusive diagnosis.

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Case 1

A 20 year-old Chinese man had fever for two months. There was non-productive cough, intermittent symptoms of abdominal discomfort as well as anorexia and weight loss. He had a moderate right sided pleural effusion (Fig 1), without lymphadenopathy or any other findings on examination. The erythrocyte sedimentation rate (ESR) was 56 mm in the first hour, the haemoglobin was 11.3 g/dL, and there was a polyclonal band on electrophoresis of the plasma proteins. Blood and urine cultures were negative, and serological tests for antinuclear antibody and rheumatoid factor were negative. The pleural fluid was straw coloured and exudative. There was no growth of organisms and the smears were negative for acid-fast bacilli on Ziehl-Nielsen staining. No malignant cells were seen.

The CT scan of the abdomen (Fig 2) showed thickening in the small bowel and colon with evidence of infiltration of the mesentery by soft tissue masses.

A small amount of loculated ascites was present. A laparoscopic examination of the peritoneal cavity was performed under general anaesthesia. The two hallmarks were soft adhesions and tubercles ranging in size from 0.5 cm to 2 cm (Fig 3). They were found on the surface of the small intestine, falciform ligament and parietal peritoneum. The adhesions were soft and pink like candyfloss lying between the small intestine and the anterior abdominal wall; ascites was present.

The histology of the tubercles confirmed widespread granulomatous inflammation. The culture of the pleural fluid subsequently grew mycobacterium tuberculosis sensitive to first line drugs. Treatment with anti-tuberculous drugs led to a complete recovery.

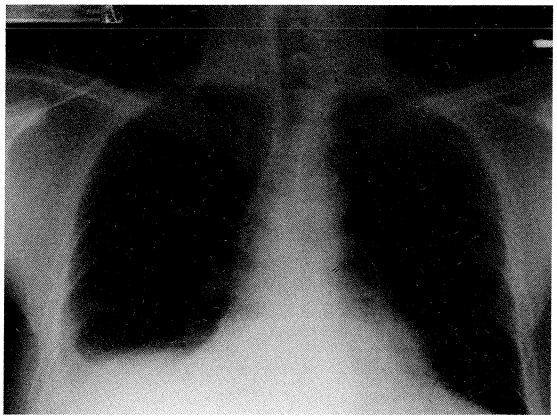

Fig 1 – Chest X-ray: Right pleural effusion.

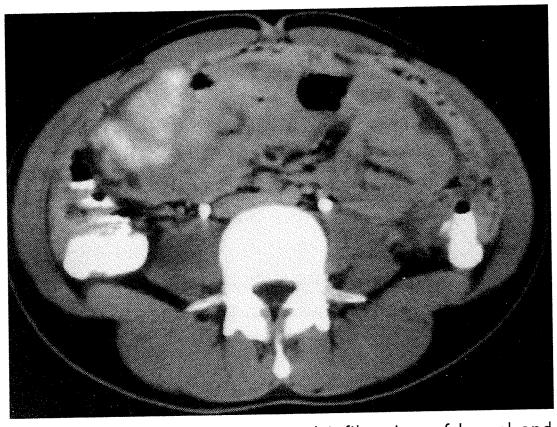

Fig 2 – CT scan: Thickening and infiltration of bowel and mesentery.

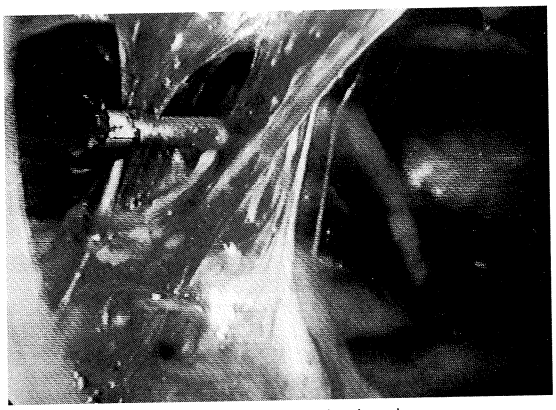

Fig 3 – Laparoscopy: Adhesions and tubercles.

Case 2

A 39-year-old Burmese man complained of fever of 2 months' duration, with anorexia, epigastric discomfort and weight loss. Examination was unremarkable apart from the fact that the abdomen felt "doughy". The ESR was 90 mm in the first hour, and haemoglobin was 10.2 g/dL. While the chest X-ray was clear, the CT scan of the abdomen (Fig 4) showed extensive lobulated masses with rim enhancement at the porta hepatis, mesenteric, para-aortic as well as the retrocrural region, consistent with that of enlarged lymph nodes.

A laparoscopic examination of the abdomen showed that the peritoneum was studded with nodules. Similar nodules were also present at the edge of the liver and on the surface of the viscera. Adhesions were present between the anterior abdominal wall and the viscera. Histology confirmed granulomatous inflammation with groups of epitheloid histiocytes and Langhans giant cells. Treatment with anti-tuberculous drugs led to an uneventful and complete recovery.

Case 3

A 52-year old Chinese man presented with a week's history of fever, abdominal discomfort and distension as well as weight loss. He smoked and consumed about one unit of alcohol every day. On examination, there was moderate ascites without stigmata of cirrhosis, abdominal mass or tenderness. The ESR was 7 mm in the first hour; haemoglobin was 15.8 g/dL; MCV was 87.3 fl; WCC 7.26 x 10^9/L and platelets 371 x 10^9/L. Liver function tests and urea and electrolytes were normal. The CT of the abdomen showed the presence of ascites and a small right pleural effusion. Multiple small hypodense nodules were distributed diffusely in the entire liver (Fig 5). No adenopathy was seen.

At laparoscopy, the peritoneum was studded with nodules of various sizes. The liver and falciform ligament were practically replaced by nodular swellings. There was no adhesion and ascites was present and the fluid appeared a little turbid. Histology of the peritoneal nodule revealed granulomatous inflammation, with follicles made up of epitheloid cells and Langhans type giant cells, with some areas of central necrosis. Pleural biopsy also revealed features of granulomatous inflammation. Mycobacterium tuberculosis was cultured from the pleural fluid.

He was treated with anti-tuberculous drugs and made a complete recovery.

Case 4

A 27-year-old Malay man was troubled by intermittent high fever, vague abdominal pain, anorexia, vomiting, and weight loss for about 6 months. He had been investigated at several hospitals but no diagnosis was determined. Clinical examination was unremarkable. The ESR was 52 mm/hr and the haemoglobin was 11.4 g/dL. The CT scan of the abdomen showed the presence of ascites. No other abnormality was present.

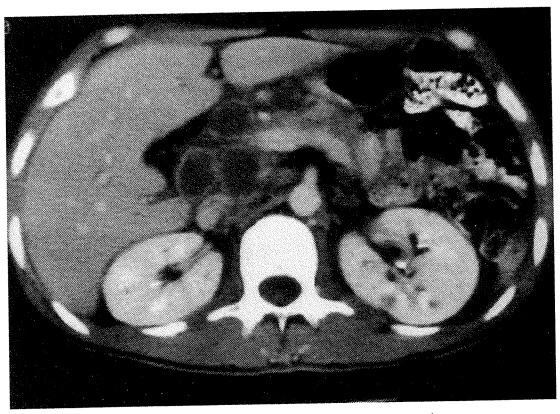

Fig 4 – CT scan: Lobulated masses with rim enhancement.

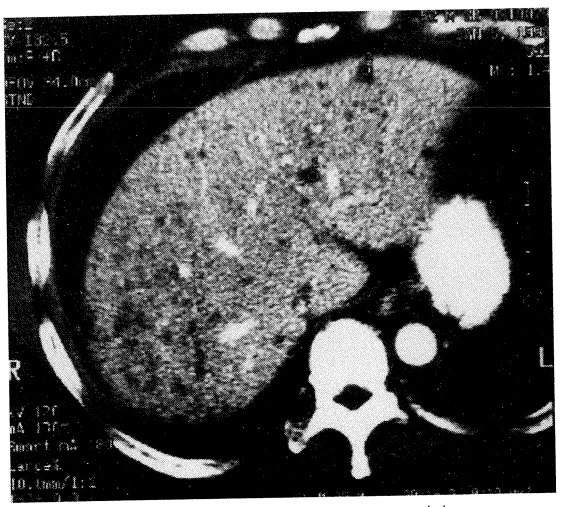

Fig 5 – CT scan: Multiple small hypodense nodules.

At laparoscopy, the peritoneal surface was covered with white nodules. There were soft adhesions between the viscera and abdominal wall. Although biopsies were taken, only fibroadipose tissue was obtained.

In view of the clinical presentation and laparoscopic findings, a diagnosis of peritoneal tuberculosis was made despite the negative histology. A rapid response to anti-tuberculous drugs was obtained with resolution of the fever and clinical symptoms and he eventually made a full recovery.

DISCUSSION

Pulmonary tuberculosis is still a relatively common condition in Singapore and there are indications that there is a slight rise in incidence. However, with the advent of new and more effective anti-tuberculous chemotherapeutic agents, pasteurisation programs and better hygiene, abdominal tuberculosis is now a rare disease in the developed world and is usually a disease of immigrants[1-3]. It however poses problems in diagnosis. The clinical presentation is often non-specific and may be in the form of unexplained pyrexia, weight loss or ill-health and various abdominal symptoms[4,5]. In many series, evidence of disease outside the abdomen is often not present and in about half the cases, the chest X-ray is normal[2,6,7].

From a clinico-pathological point of view, abdominal tuberculosis can present either as a tuberculous peritonitis or gastrointestinal tuberculosis. Occasionally, both presentations may be seen in the same patient[2]. The intestinal form of abdominal tuberculosis is frequently encountered by the surgeon, as it may present as an acute form of gastrointestinal obstruction, or perforation simulating an acute appendicitis or acute peritonitis. Other cases may appear in the chronic form with colicky abdominal pain, weight loss and an abdominal mass simulating carcinoma, Crohn's disease or abdominal carcinomatosis. Usually, the diagnosis of intestinal tuberculosis is made at laparotomy, but sometimes discovered as a histological surprise.

On the other hand, tuberculous peritonitis in the majority of cases as in our four patients has an insidious onset of several months' duration; although there may be fever, weight loss and abdominal pain, the patient is not likely to present with intestinal obstruction or any feature that warrants a laparotomy. It is a disease which has no characteristic clinical feature from which a firm diagnosis can be made, and even after thorough investigation, the diagnosis can be elusive. Tuberculous peritonitis can be further subdivided into "ascitic" and "plastic" forms. The "ascitic" form is characterised by having free fluid in the abdomen; the "plastic" form reflects a more advanced stage of the disease when there is adhesion of the bowel loops and omentum to each other giving rise to abdominal pain, tenderness, distension and probably the "doughy" feel on palpation. The diagnosis of tuberculous peritonitis is often overlooked, either because the presentation is subtle or because the signs are non-specific. A high index of suspicion is required to enable a correct diagnosis.

Confirmation of the diagnosis is essential prior to the administration of anti-tuberculous treatment in view of the potential risks of such treatment and the possibility of alternative diagnoses like malignancy or lymphoma with different prognostic implications. In the presence of ascites, the presence of straw-coloured fluid with predominance of lymphocytes on paracentesis is suggestive but not diagnostic. Culture of the ascitic fluid is not always reliable and besides it may take several weeks to yield a positive result. Percutaneous peritoneal biopsy by means of a Cope needle was advocated by Levine[8] who obtained good results. However, others[9] reported less success with this technique, which may only be used in the presence of ascites[10].

Our four patients presented with fever and non-specific abdominal symptoms. Two of them had normal chest X-rays. It was important to obtain a definitive diagnosis. In this respect, the CT scan of the abdomen has been very useful in suggesting the possibility of abdominal tuberculosis. Three out of the four patients had ascites detected on the CT scan, although in only one of them was the ascites evident clinically. The CT scan appearances in Case 1 of bowel thickening in the small bowel and colon with infiltration of the mesentery by soft tissue masses, and in Case 2, extensive lobulated masses with rim enhancement were highly suspicious of abdominal tuberculosis. In a review of the CT evaluation of 27 cases of proven abdominal tuberculosis[11], adenopathy was the most common feature. Enlarged nodes were found in the para-aortic/pericaval retroperitoneum, mesentery, omentum, peripancreatic and porta hepatis regions. Adenopathy patterns vary widely including increased numbers of nodes of normal size, scattered mildly enlarged nodes, localised clusters of several enlarged nodes and large conglomerate masses. In some patients, the centres of enlarged lymph nodes were of low density and administration of intravenous contrast accentuated this finding by enhancing the inflammatory rim surrounding the caseous centre. This appearance is well exemplified in our second patient.

The crux of the diagnosis of tuberculous peritonitis in all our four patients was the use of laparoscopy. This technique has been previously described[1,6,12,13]. An unnecessary laparotomy is avoided and the technique allows a full inspection of the peritoneal cavity and biopsies of the tubercles. In all the four patients described, the peritoneum was studded with tubercles. The appeareance is characteristic, although carcinomatosis peritonei, miliary Crohn's disease or starch peritonitis are other possible considerations. In three of the patients, histological confirmation for tuberculosis was

obtained and in the fourth patient, inadequate sampling did not allow confirmation of the diagnosis, but the subsequent complete response to anti-tuberculous drug therapy with the clinical and radiological background substantiated the diagnosis. Culture of the tubercles is often negative despite the presence of caseating granulomas, and the clinician should not depend on a positive culture before initiating treatment.

REFERENCES

1. Khoury GA, Payne CR, Harvey DR. Tuberculosis of the peritoneal cavity. Br J Surg 1978; 65:808-11.
2. Bastani B, Shariatzadeh MR, Dehdashti F. Tuberculous Peritonitis - Report of 30 cases and review of the literature. Q J Med 1985; 56:549-57.
3. Klimach OE, Ormerod LP. Gastrointestinal tuberculosis: A retrospective review of 109 cases in a district general hospital. Q J Med 1985; 56:569-78.
4. Teh LB, Ng HS, Ho MSI, Ong YY. The varied manifestations of abdominal tuberculosis. Ann Acad Med Singapore 1987; 16:488-94.
5. Chee A, Guan R, Ang PT, Prabhakaran K, Cheah JS. Abdominal tuberculosis revisited. Ann Acad Med Singapore 1987; 16:495-500.
6. Lambrianides AL, Ackroyd N, Shorey BA. Abdominal tuberculosis. Br J Surg 1980; 67:887-9.
7. Gilinsky NH, et al. Tuberculous perforation of the bowel. A report of 8 cases. S Afr Med J 1986; 74:44-6.
8. Levine H. Needle biopsy in diagnosis of tuberculous peritonitis. Am Rev Resp Dis 1968; 98:519.
9. Singh MM. Tuberculous peritonitis. An evaluation of pathogenic mechanisms, diagnostic procedures and therapeutic measures. NEJM 1969; 281:1091-4.
10. Vyravanathan S, Jeyarajah R. Tuberculous peritonitis: A review of thirty-five cases. Postgrad Med J 1980; 56:649-51.
11. Hulnick DH, Megibow AJ, Naidich DP, Hilton S, Cho KC, Balthazar EJ. Abdominal tuberculosis: CT evaluation. Radiology 1985; 157:199-204.
12. Shukla HS, Bhatia S, Naitrani YP, Das PJ Gupta SC. Peritoneal biopsy for diagnosis of abdominal tuberculosis. Postgrad Med J 1982; 58:226-8.
13. Wolfe JHN, Behn AR, Jackson BT. Tuberculous peritonitis and role of diagnostic laparascopy. Lancet 1979; 1:852-3.