Laparoscopy in tuberculous peritonitis

J Hossain MRCP **A K Al-Aska** FAIM **I Al Mofleh** FAIM *Division of Gastroenterology, Department of Medicine, College of Medicine, King Saud University, Riyadh, Saudi Arabia*

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Summary

Intra-abdominal tuberculosis remains a significant health hazard in the developing countries. In countries where sophisticated medical facilities are not easily available, laparoscopic examination of intra-abdominal organs is helpful. In this study, 22 patients were found to have peritoneal tuberculosis out of 82 laparoscopic examinations. The major clinical presentation in these patients were abdominal pain, weight loss, fever and ascites. Tuberculin test was not always positive. Direct visualization of the peritoneum and obtaining peritoneal biopsies provide the definitive tissue diagnosis to confirm the clinical diagnosis.

Introduction

Tuberculosis continues to be a major health hazard throughout the world particularly in the developing countries[1]. Extrapulmonary tuberculosis constitutes a significant proportion of these infections and presents major diagnostic problems in the under-developed world where sophisticated medical facilities are scarce. In the developed world, the pattern of tuberculosis is changing in favour of non-pulmonary tuberculosis which is increasing in frequency[5]. Apart from preventative measures, early detection and treatment of tuberculosis contributes significantly to the control of the disease.

In this report, we describe our experience with 22 cases of peritoneal tuberculosis at King Khalid University Hospital, Riyadh, between 1984 and 1988. The role of laparoscopic examination in establishing the diagnosis is discussed.

Patients and methods

The laparoscopies were performed in the Division of Gastroenterology, King Khalid University Hospital, Riyadh, which serves as a major general hospital for the central region of Saudi Arabia. Laparoscopic examinations were performed in patients with unexplained abdominal pain, prolonged fever, ascites of unknown origin, especially when peritoneal tuberculosis was suspected, unexplained jaundice and intra-abdominal malignancy. Between 1984 and 1988, 80 laparoscopic examinations were performed by a standard technique[2] with local anaesthesia (xylocaine 1%). Laparoscopic examinations were repeated on two separate occasions due to inadequate tissue materials obtained during the previous examination. Gynaecological laparoscopic examinations were not included in this study.

Correspondence to: Dr J Hossain, Department of Medicine, National Guard King Khalid Hospital, PO Box 9516, Jeddah 21423, Saudi Arabia

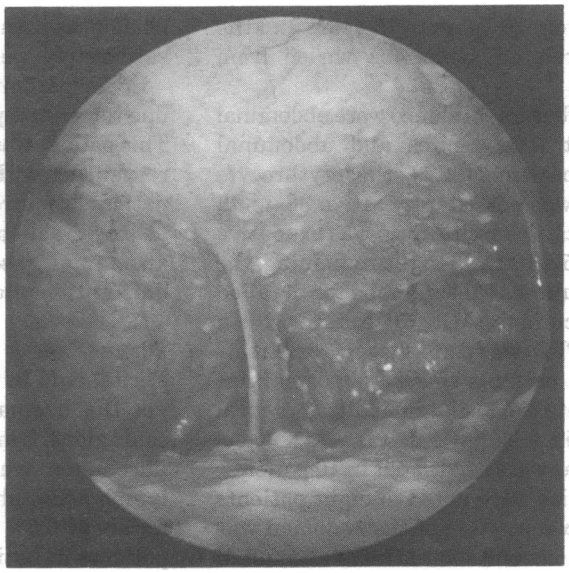

Figure 1. Multiple miliary nodules over peritoneum with adhesion band attached anterior surface of liver capsule

A laparoscopic diagnosis of tuberculous peritonitis was made in the presence of discrete or confluent uniform, white or yellow miliary nodules over the peritoneum, liver, omentum, spleen with or without adhesion bands between the bowel loops and abdominal wall (Figure 1). Ascitic fluid and/or tissue material obtained during laparoscopic examination were subjected to acid fast staining and culture for *Mycobacterium tuberculosis*. When microbiological confirmation of the diagnosis was not forthcoming a positive response to anti-tuberculous chemotherapy was regarded as evidence of presence of tuberculous infection in the peritoneum. In addition, a peripheral lymph node or aspirated tissue material was examined for *Mycobacterium tuberculosis*, where peritoneal biopsy was not adequate or inconclusive.

Results

Out of 82 laparoscopic examinations 28 patients had liver cirrhosis (including chronic active hepatitis), 22 patients had peritoneal tuberculosis, five patients had schistosomal liver fibrosis, nine patients had liver malignancies (hepatocellular carcinoma, secondary metastasis, lymphoma), two patients had granulomatous hepatitis due to brucellosis, two patients had adenocarcinoma of the peritoneum, pseudomyxoma peritonei in two patients, fatty liver in two patients, and haemangioma in one patient. In nine patients the investigation was inconclusive. A total of 22 patients (13 males and 9 females) were diagnosed as having tuberculous peritonitis. Thirteen patients were Saudi nationals, seven were Yemeni and two other nationals.

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Table 1. Clinical features of peritoneal tuberculosis in 22 patients

Symptoms	*Number*	*Signs*	*Number %*
Abdominal pain	17 (77%)	Ascites	14 (63%)
Fever	15 (68%)	Abdominal tenderness	8 (36%)
Weight loss	16 (72%)	Peripheral lymph node	3 (13%)
Abdominal swelling	10 (50%)	Hepatomegaly	4 (18%)
Anorexia	8 (36%)	Abdominal mass	2 (9%)
Night sweat	5 (22%)		
Cough	3 (13%)		

Their ages ranged from 20 years to 75 years and the duration of their related symptoms varied from 3 weeks to 2 years.

The major clinical features (Table 1) were abdominal pain, fever, weight loss, ascites and abdominal tenderness. In 19 patients (86%), the erythrocyte sedimentation rate was persistently above 30 mm/h (mean). In 11 patients, the ascitic fluid was exudative in nature (protein 2.5 g/100 ml). In the remaining, the volume of ascitic fluid was insufficient for detailed examination. Tuberculin test with 10 units of protein purified derivative (PPD) was performed in 19 patients and among them 11 patients showed abnormalities such as lung infiltrate (57%) and in addition pleural effusion was noted in four patients (21%).

Small bowel enemas were carried out in 10 patients. Mucosal abnormalities were noted in eight patients (80%). Ultrasound examination of the abdomen was performed in 21 patients and showed intra-abdominal lymph node enlargement in three patients (14%) and ascites in 14 patients (63%). In one patient renal calcification was noted on ultrasound examination. One patient presented with epileptic fit and a computerized tomography of the head showed evidence of tuberculoma.

Histological examination of the peritoneal tissue in 16 patients (72%) demonstrated caseating granuloma. In four of these acid fast bacilli were confirmed by Ziehl-Neelson staining. In two patients, the peritoneal biopsy was inconclusive but this patient had evidence of duodenitis on upper intestinal endoscopic examination and a biopsy from the duodenum showed granulomata consistent with tuberculosis. In another two patients, *Mycobacterium tuberculosis* were grown from the ascitic fluid. In two patients peritoneal tissue was uninformative, but their clinical features were suggestive of tuberculosis and they responded to antituberculous chemotherapy. The complications following laparoscopy were few. Two patients had minor oozing of ascitic fluid through the laparoscopic wound for more than 24 h. In another two patients extensive ecchymosis were noted in the surrounding area around the laparoscopic wound, and in another patient omental haematoma was noted due to injury while introducing the trocar of the laparoscope. This patient was closely followed with no further untoward event. None had a serious complication due to the laparoscopic examination.

All of our patients with confirmed diagnosis and others suggestive of tuberculosis of the peritoneum were treated with rifampicin, isoniazid and ethambutol for 2 months, then rifampicin and isoniazid continued for a total period of 12 months. Three patients were lost to follow-up after 3 months. The remaining 18 patients had an average follow-up period of 24 months with complete resolution of symptoms and satisfactory weight gain.

In one patient the disease recurred after 4 months due to non-compliance in taking regular medication. This patient was closely monitored for compliance and responded without futher problem. None of our patients required surgery due to complications such as intestinal obstruction, fistula formation or intra-abdominal abscess. None of the 18 patients died during the follow-up period.

Discussion

Peritoneum in tuberculous disease may be involved via the haematogenous, lymphatic route or from contagious lymph node. Tuberculous peritonitis is uncommon when compared with pulmonary and lymph node tuberculosis[3]. It is estimated to account for about 0.5% to 1% of tuberculosis in hospitalized patients in Latin America[3] and Asia[4]. There are few hospital-based data on extrapulmonary tuberculosis in Saudi Arabia[6,18]. It is difficult to estimate the prevalence of extra-pulmonary tuberculosis due to lack of proper community-based studies. However, in Saudi Arabia the reported incidence of tuberculous peritonitis in hospital patients is about 3%[6,7]. In our series, 22 patients had tuberculous peritonitis out of 82 laparoscopic examinations. Abdominal pain in tuberculosis is due to inflammation of the peritoneum and other solid organs in the abdomen and is usually deep seated and dull in nature, although intestinal obstruction may produce obstructive symptoms such as colicky pain and vomiting. Partial obstruction of the intestinal lumen were noted in three of our patients (two on barium contrast study of the small bowel and one had pyloric outlet obstruction) on upper gastrointestinal endoscopy. On laparoscopic examination these patients had extensive adhesions in the peritoneum and bowel loops. In three patients adhesions were so extensive that the intestines were pulled up like a curtain in front of the liver so that its surface could not be visualized. Ultrasonically in these patients mass lesions were noted in the abdomen due to adhesions.

More than half of our patients had ascites and in the remainder the peritoneum was dry indicating the plastic form of the disease. Tuberculosis in the abdomen may present as enteritis[8] and four of our patients had chronic diarrhoea for more than a month. Two patients experienced severe constipation.

Investigation such as the tuberculin skin test are positive in 30% to 78% of patients[3,4]. Fourteen (70%) of our patients had negative tuberculin skin test with 10 units of PPD. In agreement with other studies[8,9] we found examination of the ascitic fluid to give a poor diagnostic yield[8-10]. In fact we recovered

Mycobacterium tuberculosis from ascitic fluid in only two patients in this series.

Furthermore not all ascitic fluid in these patients was exudative in nature. Transudative ascitic fluid has been reported in the presence of active tuberculosis, especially with cirrhosis of liver[11]. Radiological investigations such as chest X-ray showing apical infiltration, pneumonia or pleural effusion and barium contrast study of the small bowel to delineate mucosal thickening, irregularity or strictures may be helpful in the diagnosis of abdominal tuberculosis but are not confirmatory. Positive tuberculin test, ascitic fluid examination for lymphocytosis and exudates, and radiological abnormalities in the chest or in the intestine may aid in the diagnosis of tuberculosis but these tests are non-specific.

To confirm the diagnosis, it is essential to visualize the diseased peritoneum and other intra-abdominal organs. If characteristic 'tubercles' are observed in the peritoneum or on the liver surface then diagnosis of tuberculosis is fairly accurate in 75% of patients[11]. As carcinomatosis of the peritoneum or lymphoma may be considered in the differential diagnosis, then a biopsy of the peritoneum or the liver would be required to exclude them and the presence of granulomata or acid fast bacilli in the biopsy material will allow confirmed diagnosis of peritoneal tuberculosis without laparoscopy. A laparotomy may be required to obtain tissue from the peritoneum, liver or omentum. This involves anaesthesia, theatre, time and surgical trauma all of which may increase the morbidity and mortality[4] in an already sick patient.

Percutaneous closed peritoneal biopsy advocated by Levine[12] has had a variable success[13,14], but laparoscopic examination allows the operator to visualize the peritoneum, liver, bowel loops and omentum and to biopsy the diseased area under direct vision. In a previous study, laparoscopic examination of the peritoneum confirmed the diagnosis by visual impression in 75% of all cases[11]. In our series, 16 patients (72%) had visual evidence of 'tubercles' and all of them showed histological proof of tuberculosis of the peritoneum. Laparoscopy is rapid, cheap, safe and accurate in diagnosis[15,16] and spares the patient the discomfort of surgery. The mortality of untreated tuberculous peritonitis is about 50% but the use of anti-tuberculous chemotherapy reduces it to 7%[17]. Therefore a high index of suspicion of this clinical entity is to be borne in mind and when the diagnosis is in doubt, a laparoscopic examination should be performed to detect this potentially fatal disease.

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