Case Report

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Tuberculous peritonitis in the first trimester of pregnancy

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Tuberculous peritonitis in pregnancy is a rare form of extrapulmonary tuberculosis that is not easily diagnosed. The clinical presentations of tuberculous peritonitis are usually non-specific and mimic those of other diseases, such as ovarian malignancy or chronic liver disease, and this non-specificity can cause diagnostic delays and complications. The authors report the case of a 31-year-old primigravida woman who presented with uncontrolled fever, dyspnea, elevated liver enzymes, and mild abdominal distension at 13+2 weeks of gestation. At 14+2 weeks, a therapeutic abortion was conducted and tuberculous peritonitis was confirmed by laparoscopic excisional biopsy of peritoneal nodules and histopathologic examination. The patient recovered on antituberculosis therapy and abdomen and chest follow up radiographic findings have confirmed improvement.

Keywords: Peritonitis, tuberculous; Pregnancy

Introduction

In pregnancy, Tuberculous peritonitis (TP) is an uncommon form of extrapulmonary tuberculosis, and its diagnosis is likely to be delayed because the results of radiologic evaluations and laboratory investigations are usually non-specific [1]. The use of a surgical peritoneal approach for diagnosis may also be difficult because of the risks posed by anesthesia to the pregnant women and fetus and the risk of preterm labor, and because of poor lesion accessibility. However, early diagnosis and treatment of TP in pregnancy are critically important, because obstetric morbidity and neonatal mortality are high. Here we present a case of a pregnant woman with TP at first trimester.

Case report

A 31-year-old primigravida woman of parity 0-0-0-0 was referred to our emergency room at 13+2 weeks of gestation with uncontrolled fever, chill, dyspnea, elevated liver enzymes, and mild abdominal distension. The fever (up to 38.0°C) had started at 11+5 weeks, and the diagnosis made at the time was acute pyelonephritis, which was addressed with 10 days of antibiotic treatment. However, the fever was not controlled and the patient's general condition and laboratory findings worsened. There was no medical history of hepatitis, pulmonary tuberculosis, thyroid disease, or diabetes mellitus.

The patient was 157 cm tall and weighed 54 kg (body mass index 21.9 kg/m^2). At admission her blood pressure was 98/55 mmHg, heart rate 100/min, respiratory rate 18/min, and body temperature 38.0°C. Her abdomen was mildly distended and bilateral mild costovertebral angle tenderness were observed.

Laboratory tests results were as follow; white blood cell (WBC) count 7,160/mm^3, hemoglobin 10.9 g/dL, hematocrit 30.8, neutrophil count 87.7%, platelet count 166,000/mm^3, erythrocyte sedimentation rate 50 mm/hr, C-reactive protein 6.31 mg/L, and CA 125 level 472 U/mL. Liver function testing showed; aspartate aminotransferase (AST) 511 U/mL, alanine

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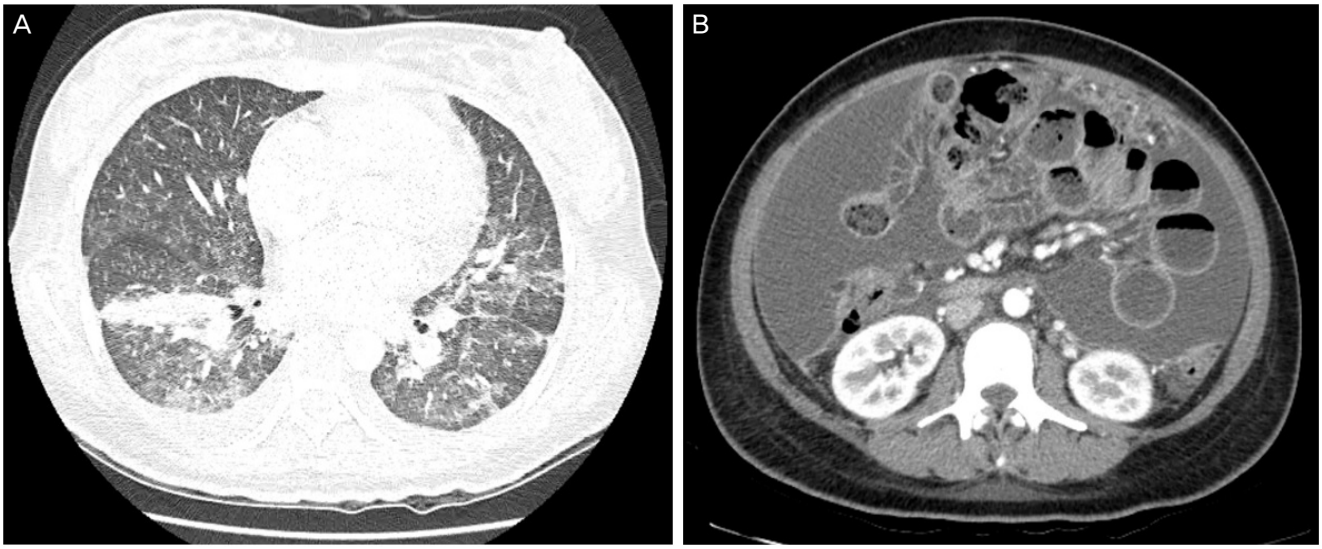

Fig. 1. (A) Chest computed tomography image showing diffuse miliary nodules and ground glass opacity patterns in both lungs. (B) An abdominopelvic computed tomography image showing large amount of ascites and omental fatty infiltration.

transaminase (ALT) 383 U/mL, serum Na^+ 133 mEq/L, K^+ level 3.1 mEq/L, CL^- 103 mEq/L, and albumin 2.8 g/dL. Serology was negative for viral hepatitis (B and C). The renal function test results were; pH 6.0, ketone body 2+, red blood cells many per high power field, and WBCs 6 to 10 per high power field. Abdominal ultrasound revealed ascitic fluid in anterior and posterior uterine spaces and both paracolic gutters (4 to 5 cm), normal ovaries, and a single fetus with a crown rump length of 5.9 cm (12+3 weeks). Paracentesis was performed to determine the nature of the ascites. The aspirated fluid was clear and straw colored and had a WBC count of 1,275/mm^3, 40% of cells were lymphocytes and 43% were polymorphonuclear leukocytes, its glucose level was 50 mg/dL, protein 3.1 g/dL, albumin 1.6 g/dL, and adenosine deaminase (ADA) 107.6 IU/L. Polymerase chain reaction (PCR) was negative for *Mycobacterium tuberculosis* (*M. tuberculosis*). Cytologic examination of ascitic fluid was unremarkable. Chest radiography depicted neither an active nor an old pulmonary tuberculosis lesion, but did reveal mild pulmonary congestion in both lungs. PCR was negative for sputum *M. tuberculous*.

Initially, she was treated conservatively by intravenous administration of fluid and antibiotics (cefotaxime, metronidazole, and azithromycin), but her clinical condition and laboratory tests did not improve. Body temperatures fluctuated daily between 35°C and 39°C. On hospital day 3, blood WBC count was 5,030/mm^3, hemoglobin 9.0 g/dL, AST 388 U/mL, and ALT was 341 U/mL, and chest radiography showed moderate pulmonary congestion and pleural effusion. From this time, her general condition deteriorated and the abdominal distension and dyspnea progressively worsened, and she could not sleep or take food. On hospital day 8, a therapeutic abortion was conducted. Unfortunately, no *M. tuberculous* culture was performed on the abortus, but placental pathologic findings indicated acute suppurative deciduitis. Chest and abdominopelvic computed tomography showed diffuse miliary nodules and ground glass opacity patterns in both lungs and large amounts of ascites with omental fatty infiltration (Fig. 1). On hospital day 9, laparoscopic surgery was conducted and a large amount of straw colored, clear ascitic fluid was noted, and the whole abdomen, including the pelvic cavity, contained membranous adhesions yellow-white nodules (Fig. 2A-D). TP was confirmed at laparoscopic surgery, and thus, antituberculous isoniazid, rifampin, pyrazinamide, and ethambutol chemotherapy was promptly started. Peritoneal yellow-white nodules were excised for histopathologic examination, and resultant findings revealed numerous noncaseating chronic granulomatous inflammations consistent with mycobacterial infection (Fig. 2E, F). In addition, fresh tissue nested tuberculous PCR (TB/NTM PCR kit, Biocore, Seoul, Korea) for *M. tuberculosis* returned a positive result.

On hospital day 11, the spiking fever disappeared and the patient's general physical condition was satisfactory. Her blood WBC count was 4,220/mm^3, hemoglobin 8.7 g/dL, AST 38 U/mL, and ALT 33 U/mL, but plain chest radiography continued to show aggravated pulmonary congestion and pleural effusion. However, on hospital day 18, chest radiog-

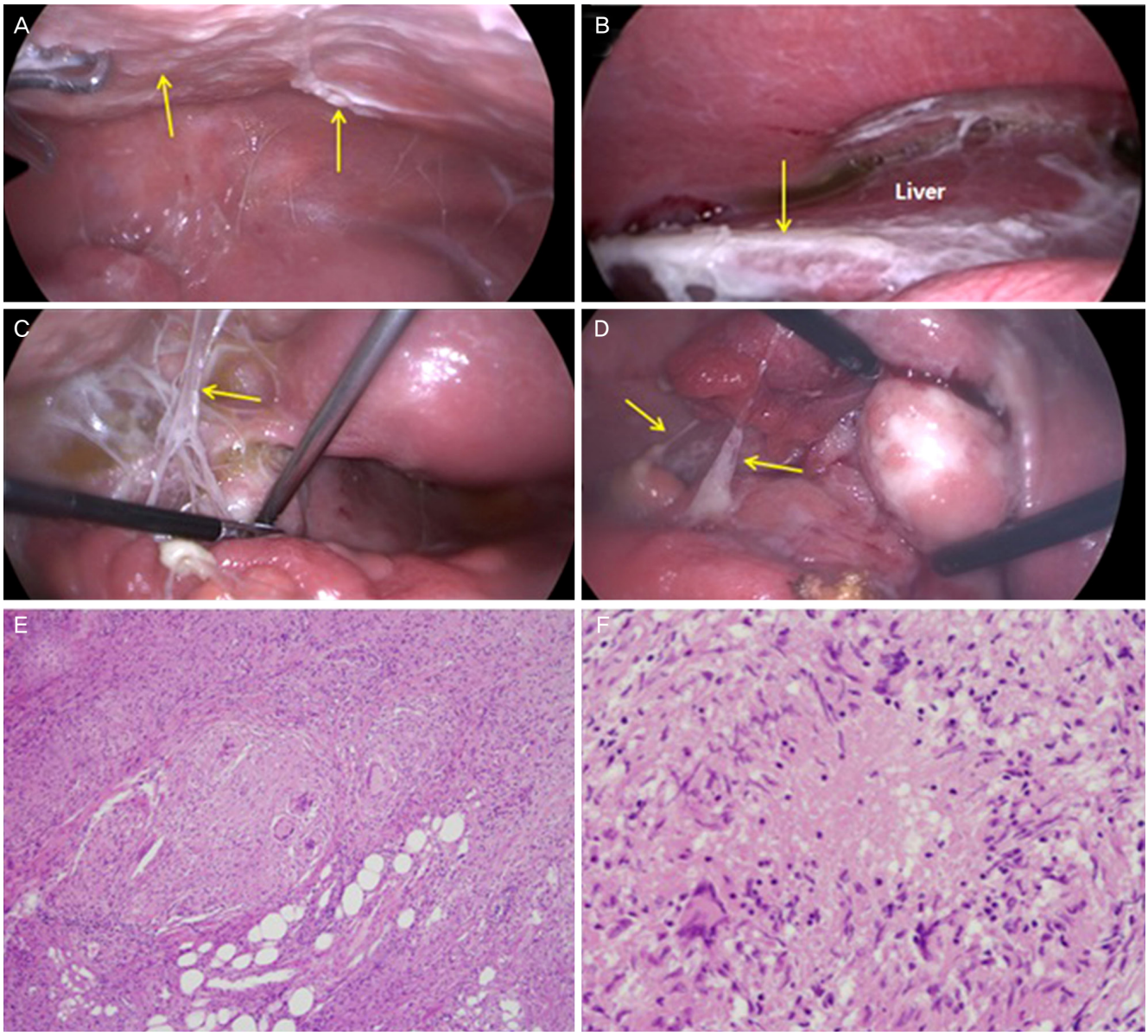

Fig. 2. Peritoneal laparoscopic findings. (A) Anterior peritoneal wall showing yellow-white multiple peritoneal nodules. (B) Liver surface with a yellow-white adhesive band. (C,D) Pelvic cavity showing severe adhesions with yellow-white threads and bands, and inflammatory changes on fallopian tube. Histopathologic examinations. (E) Peritoneal nodule showing well-defined chronic granulomatous inflammation and caseous necrosis (H&E, ×10). (F) A round granuloma containing central caseous necrosis, multinucleated giant cells and recognizable neutrophils (H&E, ×40).

raphy showed the pleural effusion had diminished. Although, at first, *M. tuberculosis* PCR of ascitic fluid was negative, after 3 weeks of culture a positive finding for *M. tuberculosis* was obtained and after 6 weeks, culture also showed *M. tuberculosis* growth; similar results were obtained for sputum and bronchial aspirates. At her 5-month and 1-year follow-up visit, liver function tests were normal, and chest radiography showed improvements of miliary lesions in both lungs, and abdominopelvic computed tomography. The woman was looking well and we recommended have a baby gradually.

Discussion

Tuberculous peritonitis is extremely rare in pregnancy, and the rate of TP among all forms of tuberculosis varies from 0.1%

to 0.7% worldwide [1]. A few cases of TP in pregnancy have been reported in the literature; with gestational ages ranging from 20 to 24 weeks of gestation [2-6]. In our case, gestational age was 13+2 weeks and fever started at 11+5 weeks of gestation.

The pathogenesis of TP probably involves hematogenous spread from a primary pulmonary tuberculosis focus or the reactivation of latent tuberculosis foci in peritoneum [7]. Less frequently organisms enter the peritoneal cavity transmurally from an infected intestine or contiguously from tuberculous salpingitis [8]. In our case, although the primary focus of *M. tuberculosis* was undetermined during early hospitalization, we suspected pulmonary tuberculosis rather than tuberculosis emanating from the gastrointestinal tract or tuberculous salpingitis, because laparoscopic findings showed neither salpingeal nor intestinal tuberculous nodules.

Although the clinical symptoms of TP are non-specific, it is commonly associated with abdominal distension, pain, fever, chill, and weight loss. Our patient exhibited symptoms of unexplained prolonged fluctuating fever, chill, abdominal distension, and dyspnea. Because of the non-specific nature of its symptoms and difficulties associated with surgical intervention, there is a tendency to defer extensive diagnostic radiological investigations, but this can delay the diagnosis of TP in pregnancy. Furthermore, investigations and radiologic investigations are of limited diagnostic value. An elevated serum CA 125 level can be confused with ovarian cancer, although it can be used as a follow-up marker [5]. Ascites is present in virtually all patients, and ascites findings of; straw-yellow fluid, protein >2.5 g/dL, leukocyte count 150 to 4,000/mm^3, lymphocyte predominance, and serum-ascites albumin gradients <1.1 g/dL should raise suspicion of TP [9]. Our peritoneal ascites showed that protein was 3.1 g/dL, WBC count was 1,275/mm^3, and 40% of cells were lymphocytes. In the differential diagnosis of non-cirrhotic ascites, a high serum level of ADA (an enzyme involved in the maturation and differentiation of lymphoid cells) can support a diagnosis of TP [9]. Several studies have demonstrated that ADA levels of >33 IU/L have a sensitivity and specificity of 100% and 95%, respectively, for the diagnosis of Tuberculous peritonitis [4,10]. Our case had a high ADA level of 107.6 IU/L at presentation.

The gold standards for the diagnosis of TP are the identification of *M. tuberculosis* in ascites and peritoneal biopsy findings compatible with tuberculosis [1]. In fact, the positive ascites culture rate for *M. tuberculosis* is less than 50% [9]. In our case, we obtained result of culture positive for *M. tuberculosis* after 3 weeks later even though the initial tuberculous PCR conducted on aspirated ascites was negative. Therefore, we had considered the acute liver disease or a tumorous condition of ovarian origin with peritoneal cavity involvement, because of her ill-looking appearance, ascites, elevated AST/ALT and CA 125, and decreased albumin.

In summary, the diagnosis of TP in pregnancy is challenging, and therefore, it should be suspected when ascites and uncontrolled fever are present during pregnancy. Accurate diagnosis requires histopathologic examination and the isolation of *M. tuberculosis* from ascites and/or caseous necrotic granulomas from peritoneal biopsy nodules. The early diagnosis and treatment of TP in pregnancy are important to prevent adverse obstetric and neonatal morbidities.

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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