A case of tuberculous peritonitis in childhood

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Introduction

In developing countries, tuberculosis remains a significant cause of morbidity and mortality. Tuberculous peritonitis (TBP) is a rare form of extrapulmonary tuberculosis that constitutes less than 1% of all tuberculosis cases [1]. TBP is primarily observed in young adults but has been reported rarely in young children [2–4]. TBP occurs as a
result of the hematogenous spread of tubercle bacilli from a primary pulmonary focus or direct access to the intestinal wall of the genital organs [5]. TBP has no specific clinical features, which makes diagnosis difficult. TBP may be confused with other infectious diseases, inflammatory bowel diseases, and malignancy. The duration of symptoms in 70% of patients is known to be longer than four months [6].

Underlying conditions, such as cirrhosis, human immunodeficiency virus (HIV) infection, diabetes, malignancy, anti-tumor necrotizing factor (TNF), and peritoneal dialysis treatment, might increase the risk of developing TBP [5]. In this article, we present the case of a four-year-old female patient without concomitant diseases, pulmonary tuberculosis, or tuberculosis contact who developed TBP to emphasize that TBP can occur in young children, albeit such occurrences are rare.

**Case report**

A four-year-old female patient was referred to our hospital (Ondokuz Mayis University) from another center with complaints of progressive abdominal distension, anorexia, and fatigue for the last 3 months. Her history was unremarkable with the exception of recurrent urinary tract infections. She had received her regular vaccines and had no contact with tuberculosis patients. Her family history revealed that her grandfather had been hospitalized due to chronic lung disease for two years. On physical examination, her body weight was 18 kg (50p), height was 103 cm (25—50p), heart rate was 110/min, blood pressure was 90/60 mmHg, and body temperature was 37.2 °C. There was one bacillus Calmette-Guerin (BCG) scar on her left shoulder. Abdominal distension and ascites were found upon an abdominal examination, and her other systems were normal. The laboratory results revealed that her hemoglobin was 10.1 g/dL, white blood cell count was 12,080/mm³, thrombocyte count was 470,000/mm³, erythrocyte sedimentation rate (ESR) was 82 mm/h, and C-reactive protein (CRP) was 105 mg/L (N: 0—5 mg/L). Liver and kidney function tests and her serum albumin level were normal. The laboratory results revealed that her hemoglobin was 10.1 g/dL, white blood cell count was 12,080/mm³, and thrombocyte count was 470,000/mm³, and erythrocyte sedimentation rate (ESR) was 82 mm/h, and C-reactive protein (CRP) was 105 mg/L (N: 0—5 mg/L). Liver and kidney function tests and her serum albumin level were normal. During examinations for the ascites etiology, the paracentesis fluid was found to be pale yellow and exudative. The serum-ascites albumin gradient was 0.9 g/dL, the ascitic blood cell count was 2730/mm³, and 70% of cells were lymphomonocytic cells. Ceruloplasmin and alpha-1 antitrypsin tests were normal. Kayser-Fleischer rings were not observed. Upon an abdominal ultrasound, massive amounts of fluid in the abdomen, peritoneal thickening, and properly contoured lymph nodes of 9 mm × 7 mm in size were observed in the mesenteric adipose tissue. The liver and spleen were normal in size and echogenicity; therefore, chronic liver disease and portal hypertension were not considered based on findings. Contrast-enhanced abdominal computed tomography revealed massive free peritoneal fluid of 7 cm in thickness, approximately 2 cm of omental thickening in the anterior abdominal wall, and multiple lymph nodes of approximately 1 cm in size in the mesenteric adipose tissue. The tuberculin skin test (PPD) induration was measured to be 29 mm. There were no pathological findings on chest radiography. The patient’s gastric juice, which was taken three times, was found to be negative for acid-resistant bacillus (ARB) and tuberculosis polymerase chain reaction (PCR). Examination of the ascitic fluid revealed that the ARB, tuberculosis PCR, and culture results were negative, and the adenosine deaminase level was 159 U/L (normal: 0—40). A laparoscopic biopsy was performed and revealed a widely tuberculoid appearance in the peritoneum, and 1300 mL of fluid was drained from the ascites. Cytological examination of the peritoneal fluid was unremarkable. Triple antituberculosis therapy (i.e., isoniazid, rifampicin, and pyrazinamide) was initiated. Granulomas of different diameters, Langhans-type mononuclear giant cells, and caseous necrosis were observed in the peritoneal biopsy (Fig. 1). The patient, who had no fever, abdominal pain, or any additional complaints, was discharged on the 20th day of hospitalization. During the three months of outpatient follow up, pyrazinamide was discontinued at the end of the second month, and regression of the

![Figure 1](image-url)
A case of tuberculous peritonitis

abdominal distention and ascitic fluid and weight gain were observed. In the fifth month of treatment, the patient’s general condition was good, and a physical examination was normal. The patient’s treatment was scheduled to be completed after six months of antituberculosis therapy.

Discussion

Tuberculosis currently continues to be a major health problem in developing and developed countries. More widespread use of immunosuppressive therapy, primary and acquired immunodeficiencies, such as HIV infection, and increasing migration have facilitated the spread of tuberculosis(1). TBP is a rare form of extrapulmonary tuberculosis that is observed in 0.1—0.7% of all tuberculosis cases and can develop via hematogenous spread from a primary pulmonary focus or via direct passage from the genitalia to the bowel wall [7]. In the United States, TBP has been reported to be responsible in 3.3% of patients with extrapulmonary tuberculosis [2].

Tuberculous peritonitis has been reported primarily in adults between the ages of 35 and 45 years and is extremely rare in children [7]. Forssbohm et al. [8] reported that, in Germany, TBP has been observed in only 5% of patients under the age of 14. A study conducted by Dinler et al. [7] involving nine children with tuberculous peritonitis identified the mean age of the patients as 14.2 years (11—16 years). In the literature, only a few cases of TBP have been described in early childhood. To the extent of our knowledge, the youngest cases of TBP in the literature are an 11-month-old patient who presented with chylous ascites was and reported by Azoumah et al. [3] and a 1-year-old patient who was discussed in a study of 11 children with tuberculous peritonitis conducted by Gürkan et al. [4]. Katigbak et al. [2] also reported a 15-month-old patient who was suspected of having appendicitis because the patient was suffering from fever, abdominal pain, and abdominal distention for 20 days. When the patient’s situation worsened, the diagnosis of tuberculous peritonitis was made based on laparotomic examination.

Tuberculous peritonitis has non-specific clinical symptoms. The most common symptoms are abdominal distention, abdominal pain, fever, weight loss, and night sweats. On physical examination, acid, abdominal tenderness, fever, and hepatomegaly can be detected. Our patient exhibited abdominal complaints for three months, and a physical examination revealed abdominal distension with acid.

Tuberculous peritonitis is rarely observed in childhood, and the absence of specific clinical and laboratory findings for the diagnosis often leads to a delay in diagnosis. Because the mortality rate of this disease can reach as high as 51%, one of the most important factors for reducing the mortality rate in children with chronic abdominal complaints is the recognition of this disease. Detailed family histories should be obtained for children with chronic abdominal complaints, especially those in endemic areas. One study reported that 60% of children with TBP have family histories of tuberculosis [9]. In our case, we suspected tuberculosis contact because her grandfather had a chronic lung disease, which might have been pulmonary tuberculosis, and because she had visited the hospital many times due to her grandfather’s condition.

Although a positive result from a tuberculin skin test supports the diagnosis, a negative result does not exclude the disease. Pulmonary or pleural involvement has been reported in 50—75% of patients with TBP [10]. Therefore, chest radiographies to detect the primary focus might be beneficial. There was no pulmonary involvement in our patient, who lacked any pulmonary complaints and exhibited normal chest radiography findings.

Straw-yellow acid fluid, leukocyte counts of 150—4000/mm³, lymphocyte predominance, and serum-ascites albumin gradients <1.1 g/dl should arouse suspicion of TBP. In the differential diagnosis of non-cirrhotic acid, the detection of a high level of adenosine deaminase (ADA), which is an enzyme that is involved in the maturation and differentiation of lymphoid cells, can be used to support a diagnosis of TBP. ADA has been reported to exhibit 100% sensitivity and 95% specificity for TBP [11]. The gold standard diagnostic methods for TBP are the identification of the production of Mycobacterium tuberculosis in the ascitic fluid or the detection of peritoneal biopsy findings that are compatible with tuberculosis [1]. Indeed, the frequency of a positive ascites culture is known to be less than 50% while a peritoneal biopsy performed under laparoscopy or laparotomy provides accurate results at a rate of approximately 95%. In our patient, the acid fluid properties were similar to TBP; she exhibited a significantly higher ADA level, and the diagnosis was made based on the peritoneal biopsy findings, which represent the strengths of our case. The PCR and culture negativities represent the limitations of our case.

Malignancy or chronic liver disease was initially considered, but the patient was in good general condition and exhibited normal laboratory findings (i.e., a normal liver test and a normal serum albumin level without pancytopenia), and she was also
living in an area endemic for tuberculosis. These factors led us to consider tuberculosis. The positive tuberculin skin test, ascitic fluid properties, detection of a high level of ADA, and imaging results that showed peritoneal thickening were suggestive of TBP, and the definitive diagnosis was made based on a histopathologic examination of a biopsy that was collected via laparoscopy.

In conclusion, TBP has no characteristic clinical or laboratory indicators that enable its easy diagnosis; therefore, suspicion of the disease among clinicians is very important. For patients with positive PPD results who present with chronic abdominal pain, abdominal distension, and night sweating, particularly those in endemic areas, TBP should be kept in mind during the differential diagnosis of both younger age groups and adults.

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References