# RADIOLOGICAL FINDINGS IN A CHILD WITH TUBERCULOSIS PERITONITIS

## Case Report

# TÜBERKÜLOZ PERİTONİTLİ ÇOCUKTA RADYOLOJİK BULGULAR

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## ABSTRACT

Tuberculous peritonitis is a rarely encountered disease occurring as result of disease's spreading out of a primer focal point such as pulmonary tuberculosis. Cirrhosis, HIV, diabetes, malignancy, and peritoneal dialysis are among the risk factors. It was reported that the incidence of tuberculous peritonitis varied between 0.1% and 0.7% among the types of tuberculosis.

In general, it progresses secondary to the pulmonary tuberculosis. Encountering primer tuberculosis in healthy children without tuberculosis focal point has been rarely reported in the literature. These patients can present clinical and laboratory findings such as the feeling of abdominal discomfort, swelling, weight loss, fever and increase at tumour markers. The late diagnosis of patients causes a specific increase at mortality and morbidity. In this case, we aimed to present the radiological findings of tuberculous peritonitis diagnosed lately in a healthy child without any primary disease.

**Key words:** Children, magnetic resonance, peritonitis, tuberculosis

## ÖZET

Tüberküloz peritonit sıklıkla akciğer tüberkülozu gibi primer bir odaktan hastalığın yayılması sonucu oluşan, oldukça nadir görülen bir hastalıktır. Siroz, HIV, diabet, malignensi, peritoneal diyaliz risk faktörlerindendir. Tüm tüberküloz çeşitleri arasında tüberküloz peritonit insidansının %0.1 ile %0.7 arasında değiştiği bildirilmiştir. Genelde akciğer tüberkülozuna sekonder olarak gelişir. Başka bir organda tüberküloz

odağı bulunmayan, sağlıklı çocuklarda primer tüberküloz peritoniti görülmesi ise literatürde çok nadir olarak bildirilmiştir.

Bu hastalar karında rahatsızlık hissi, şişlik, kilo kaybı, ateş, tümör belirteçlerinde yükselme gibi klinik ve laboratuar bulguları gösterebilmektedir. Hastaların tanısında gecikme mortalite ve morbiditede belirgin artmaya sebep olmaktadır. Biz bu olgumuzda herhangi bir primer hastalığı bulunmayan sağlıklı çocukta geç tanı konan tüberküloz peritonitin radyolojik bulgularını sunmayı amaçladık.

**Anahtar Kelimeler:** Çocuk, manyetik rezonans, peritonit, tüberküloz

## INTRODUCTION

Peritoneal tuberculosis(TB) is a rarely encountered disease, and it is on the sixth frequency among the organs where peritoneal extra-pulmonary TB locates. TB peritonitis including nearly 1-3% of TB cases except from the pulmonary TB causes increase at morbidity, mortality and delay at diagnosis of patients apply to a clinic with nonspecific symptoms such as the feeling of abdominal discomfort, swelling, weight loss and fever. Acid, pelvic pain, adnexal mass, increased CA-125 level determined in clinic, and omental thickening, omental soft tissues determined in radiological imaging methods can be considered as peritonitis carcinomatosis due to lymphadenopathy. In pediatric patients, it is hard to diagnose at an early period due to the nonspecific clinical findings (1,2).

For that reason, it is necessary to be suspicious of TB for diagnosis.In patients, having no primary focal point such as the pulmonary TB can delay the diagnosis. In our article, a primer TB peritonitis case delayed at diagnosis and had no TB focal point will be presented as associated with the literature.

## Case Report

A 13 year-old female patient applied with the complaint of excentric abdominal pain six months ago. The patient treated with nonspecific infection treatment applied to the pediatric surgery department of our hospital upon development of swelling in her abdomen and having no recovery in her abdominal pain. The patient was referred to our department by the request of abdominal ultrasonography (US) in order to search for the etiology. On abdominal US, there was free fluid including septa on pelvic adjacent to bowel loops. Specific thickening was noticed on fat planes adjacent to all bowel loops as being more specific in pelvic region. The border between bowel wall and fat planes adjacent to the wall could not be noticed locally (Figure1a,b).

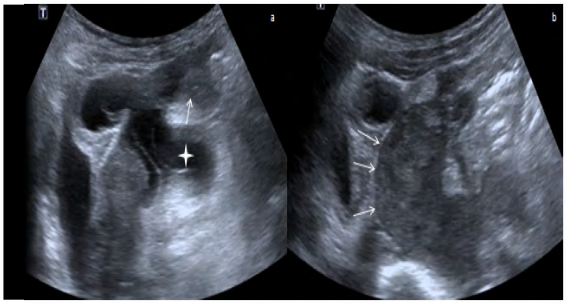

*Figure 1: On abdominal US (a), free fluid including septa in pelvis (asterisk), decrease and heterogeneity were noticed in echogenicity in pelvic fatty tissues adjacent to the free fluid (white arrow). (b), Specific thickening on bowel loop walls and adjacent fatty tissue and decrease at echogenicity were visualized (white arrows). Bowel walls and adjacent fatty tissue had glomus appearance and the border could not be visualized exactly.*

The bower loops were clustered. There were a great number of lymph nodes in mesenteric fatty tissue. Depending upon this, enhanced dynamic abdominal magnetic resonance imaging (MRI) was planned to the patient for further investigation. On abdominal MRI, especially on enhanced T1 WI series,

there was smooth thickening and specific enhancement (Figure2a,b).

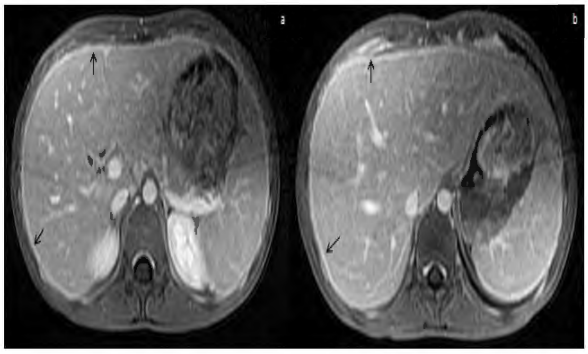

*Figure 2: On enhanced axial T1-weighted series (a,b), smooth and uninterrupted, specific thickening and enhancement was noticed on peritoneal surfaces (black arrows).*

On omental and mesenteric fatty tissue, we noticed specific heterogeneity on fat planes and fatty tissues enhanced heavily borders of which with bowel loops could not be distinguished and surrounding the bowel loops on fatty tissue (Figure 3a,b).

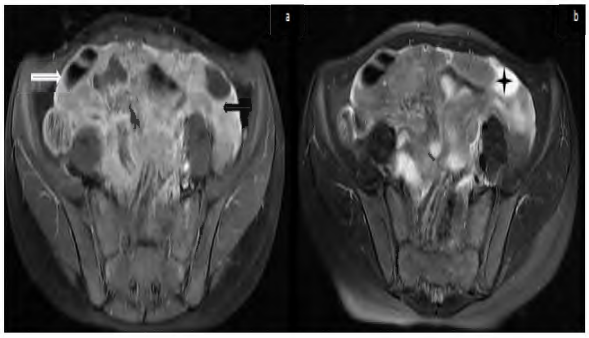

*Figure 3: On enhanced axial T1-weighted and T2-weighted series (a,b), heavily enhanced soft tissues that could not be limited clearly and not partially distinguished in terms of the borders with bowel loops, and surrounding the bowel loops on mesenteric and omental fatty tissue were visualized (black arrow). Peritoneal surfaces were thickened, and specific enhancement was present on pelvic fatty tissue (white arrow). Minimal free fluid adjacent to bowel loops was noticed (asterisk).*

The ovaries were thickened and surrounded by omentum; and there were intensive-contended and some hemorrhagic cysts. The size of ovary was increased. There was minimal free fluid in pelvic (Figure4a,b,c,d,e,f).

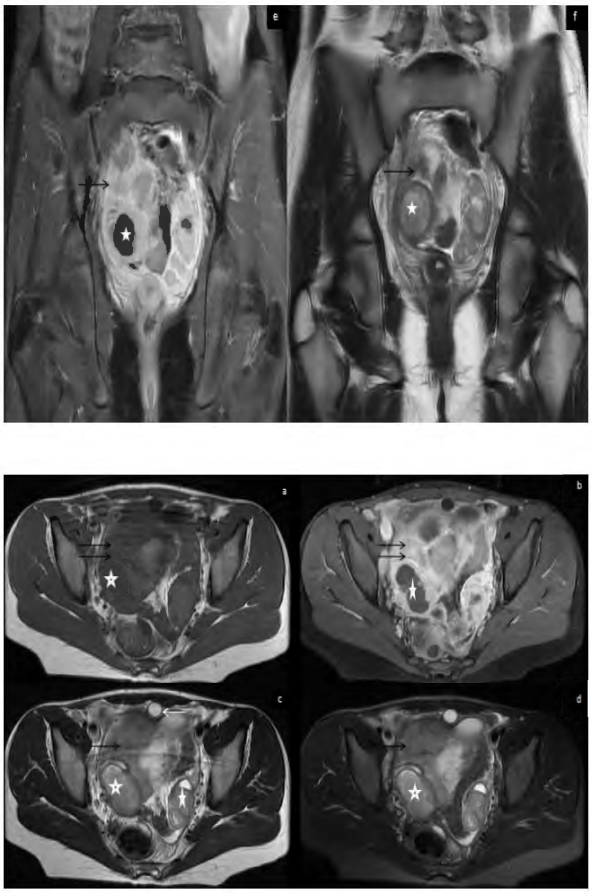

*Figure 4: On axial T1-weighted (a), axial fat-saturated enhanced T1-weighted (b), axial T2-weighted (c), axial fat-saturated T2-weighted (d), coronal fat-saturated enhanced T1-weighted (e) and coronal T2-weighted (f) series; specific thickening on omentum and intense omental enhancement were present (black arrows). The ovaries were thickened, and surrounded by the omentum; heavily-content and some hemorrhagic cysts were visualized in both ovaries (asterisk). The sizes of ovaries were increased. The free fluid was present in pelvic. It is considered that the increase at ovary sizes, and proteinosis-hemorrhagic containing cysts developed as secondary to disorder in vascularization. Urachal cyst was noticed adjacent to the left rectus abdominis muscle (white arrow).*

Within the pelvic fatty tissue, there were a great number of enlarged lymph nodes as 11x8 mm the biggest size on paraaortic region and both obturator groups. The findings were interpreted as tuberculous peritonitis. Upon this,

posterior-anterior (P-A) chest radiography was administered to the patient for investigating the primer focal point. The chest radiography was natural (Figure5).

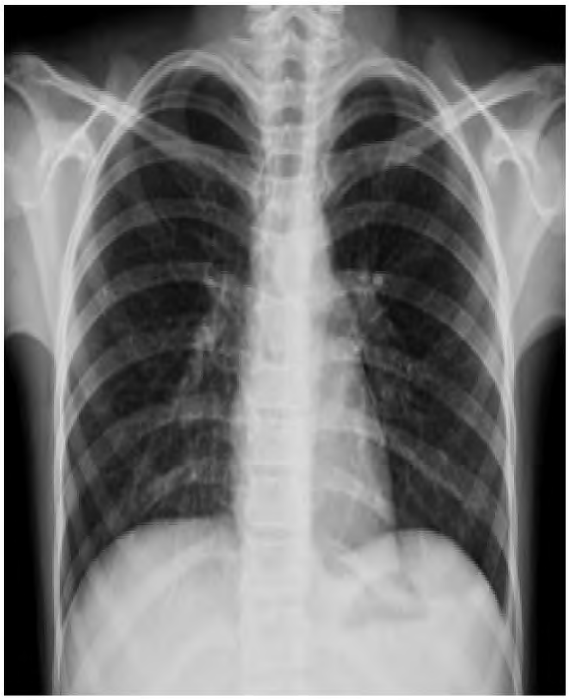

*Figure 5: On P-A chest radiography, normal findings were obtained.*

In physical examination, no pathological finding was determined in lungs. There were infection markers, and the number of leucocytes in blood biochemistry was 8.000/$mm^3$ and the number of sedimentation was 7/hour. Diagnostic laparoscopy was planned to the patient in Pediatric surgery clinic. On laparoscopic imaging, common nodules, and specific thickening in peritoneum and omentum were noticed in whole abdomen. Common cohesion was visualized between the bowel loops (Figure6).

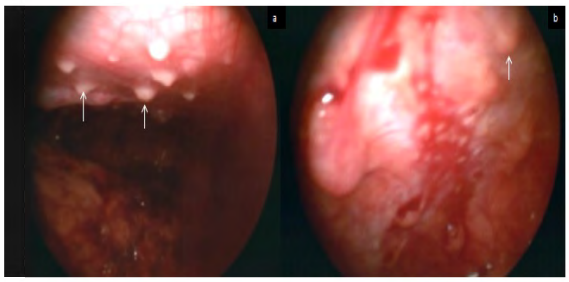

*Figure 6: On laparoscopy, common nodules on whole abdomen (white arrows), and specific thickening in peritonitis and omentum were visualized.*

The intraperitoneal fluid was aspirated for the cytological analysis. The biopsy was conducted on abdomen wall and bowel surface. Oral fluid feeding was started to the patient on postoperative 1$^{st}$ day, and the patient was referred to the pediatric outpatient department for the treatment. Upon pathological result's being caseous granulomatous peritonitis, antibiotic treatment was planned. After the treatment, complete remission was achieved in the patient.

## Discussion

TB covers nearly 1-2% of extra-pulmonary diseases (3,5).In our country, TB should be considered as an important problem and a multi-systemic disease; and moreover, TB should always be regarded in presence of an intestinal or abdominal pathology.

TB generally develops as result of active pulmonary TB's diffusing through blood. In nearly half of the patients, abdominal findings are generally associated with abnormal direct chest radiography. It can rarely occur after the direct dispersion of TB bacillus from the adjacent organs such as bowel or fallopian tubes. At an especially early period, TB peritonitis can easily be overlooked. In this case, it can be considered as intra peritoneal lesions.

It was reported in a collected study excluding thirty-five years old that the clinical findings as acid was present in

73% of the cases with TB peritonitis, abdominal pain was present in 64.5%, weight loss in 61%, fever in 59% and abdominal intolerance in 47.7%. The abdominal pain is generally associated with abdominal distention. The pain generally depends upon peritoneal and mesenteric inflammation (1). In our case, the patient firstly applied to the hospital with abdominal pain complaint, and this pain was associated with abdominal distention during the subsequent period. However, no specific high fever was noticed.

In TB peritonitis, peritoneal thickening and intensely enhancing parietal peritonitis are typically encountered. Lymphadenopathy is the high incidence finding of abdominal TB, and it is the unique abdominal finding determined in nearly half of the patients (6,7). Mesenteric, omental, peripancreatic, periportal, pericaval and upper paraaortic lymph nodes are frequently involved. Exudative acid, mesenteric infiltration of omentum and caseous nodules can be commonly noticed (5).

Three-type peritoneal involvement of TB peritonitis was defined. Wet type is noticed in 90%, and includes a great amount of acid. Fibrotic-fixed type is encountered at the rate of 7%, and includes omental masses, acid in small quantities, soft small intestine loops and mesentery. In dry type, dense adhesions, fibrous peritoneal reaction and caseous nodules are encountered (8).The amount of acid is changeable and it can be free or locular. Due to high protein content and cellular content of high density can be noticed. Koleosacid is rare, and can be considered to be related with central necrotic lymph nodes (9). In our case, there were soft small intestine loops and mesentery, and acid was noticed at a small quantity. Moreover, there were enlarged lymph nodes in omental fatty tissue. The fibrotic-fixed type as the more rarely encountered TB peritonitis type was evaluated as TB peritonitis.

Radiological findings, clinical symptoms and laboratory results of TB peritonitis and carcinomatosis are similar. There is no pathognomonic finding related to the diagnosis. Peritonitis carcinomatosis, lymphoma, acid in primer peritoneal masses and other peritonitis, irregular finite abdominal masses and omentum involvement can be noticed (10). Unless proven otherwise; mass, acid and high serum CA 125 level in abdomen makes us consider the ovarian cancer (11). However, because the gynaecologic diseases such as pelvic infections, TB, Meigs syndrome and endometriosis can increase the level of CA-125, this maker is the indicator of a nonspecific ovary tumour (12,13). Whereas the presence of smooth peritonitis and specific enhancement associated with thickening in mesentery on computed tomography( CT) proves TB peritonitis, nodular and irregular peritoneal thickening proves peritonitis carcinomatosis. Similarly, peritonitis TB cases who considered as the peritoneal invasion of ovary cancer were reported in the literature, and the attraction was drawn to the fact that TB can clinically trigger several diseases (14).

TB peritonitis is among the etiologic factors that can cause abdominal cocoon syndrome defined as sclerosant encapsulated peritonitis (15,16).In abdominal cocoon syndrome, there are thick fibrotic membranes and adhesions surrounding the bowel loops; and the clinical findings and symptoms are nonspecific. The diagnosis is generally hard to establish. Because CT characterizes bowel lumen, wall and extra-intestinal tissue, it is substantial for the diagnosis (17). It can be treated appropriately without administrating bowel resection through the early diagnosis (18,19).

The quickest and most correct method for TB peritonitis diagnosis is peritonitis biopsy and mycobacterial culture of tubercles (20).The diagnosis is generally established through paracentesis and

peritoneal biopsy. If not treated, the rate for mortality reaches up to 50%. Delay at diagnosis can be fatal (21). In our case, as well, the final diagnosis was established through peritoneal biopsy.In treatment of the patient, response to antibiotic medication was obtained.

Consequently; TB peritonitis is one of the diseases that is not considered primarily among the reasons for the nonspecific abdominal pain in children without TB disease. It causes delay at diagnosis. Increase at morbidity and mortality has been noticed. Moreover, the diagnosis can delay more due to its imitating peritonitis carsinomatosis, primer peritonitis, lymphoma, and primer peritoneal masses radiologically, its causing increase at tumour markers, and its radiological findings' becoming nonspecific during the early periods. For that reason, it is one of the diseases that should be considered radiologically for the abdominal pain without any reasons.

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