

Peritoneal TB: A Challenging Presentation in a Young Woman with Acute Abdominal Symptoms

Samira Dehghani¹, saloomeh mohammadi¹, Atefeh Mahmoudi², Fatemeh Riyahi Zaniyani³, Sasan Shafiei¹, Afrouz Emzaei⁴, yasaman tavakoli⁵, Roozbeh Narimani Javid⁶, and Athena Behforouz¹

¹Shahid Beheshti University of Medical Sciences

²Shaheed Beheshti University of Medical Sciences

³Islamic Azad University Tehran Medical Sciences

⁴Isfahan University of Medical Sciences

⁵Mazandaran University of Medical Sciences

⁶Hamadan University of Medical Sciences

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Samira Dehghani¹, Saloomeh Mohammadi², Atefeh Mahmoudi¹, Fatemeh Riyahi Zaniyani³, Sasan Shafiei⁴, Afrouz Emzaei⁵, Yasaman Tavakoli⁶, Roozbeh Narimani Javid⁷, Athena Behforouz^{1*}

1. Preventive Gynecology Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. Department of Pathology, Mahdiah Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3. Faculty of Medicine, Islamic Azad University, Tehran Medical Sciences Branch, Tehran, Iran
4. Skull Base Research Center, Loghman Hakim Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran
5. Hojjat Hospital, Isfahan University of Medical Sciences, Isfahan, Iran
6. Student Research Committee, Department of Medicine, Mazandaran University of Medical Sciences, Mazandaran, Iran
7. Student Research Committee, Hamadan University of Medical Sciences, Hamadan, Iran

AbstractIntroduction: Tuberculosis (TB) is a significant health problem worldwide. The rate of active tuberculosis in pregnancy is rising and it is a considerable cause of maternal mortality during pregnancy.

Case presentation: This study reports a young woman who was suffering from TB peritonitis, a rare, highly progressive clinical course following the spontaneous abortion of 16-week gestation. She underwent a diagnostic laparotomy that showed several small-scale implants on the peritoneum and viscera. Histopathology revealed chronic caseating granulomas with necrosis. With the possible diagnosis of tuberculosis, anti-mycobacterial therapy was initiated and she received these drugs for 6 months. The patient’s clinical manifestations completely disappeared and the chest CT scan became normal after the treatment.

Conclusion: The diagnosis of peritoneal tuberculosis is challenging and it could be made with a combination of CT imaging, explorative laparoscopy, and evaluation of biopsies from specimens and culture or PCR from ascites fluid, or infected tissues.

Keywords: TB, peritoneal tuberculosis, extrapulmonary tuberculosis, acute abdomen, pregnancy

1.Introduction Tuberculosis (TB) is a significant health problem worldwide. The geographic incidence of TB in 2023 has been reported as the following rates per 100 000 person-years (95% CrI: 2242 in Africa , 807 in the Americas, 793 in Eastern Mediterranean, 1184 in Europe, 1419 in South-East Asia and 1104 in Western Pacific. The Global rate is reported to be 1148 per 100,000 person-years (95% CrI) (1). About 25% of the whole world's population is estimated to be infected with mycobacterium tuberculosis. Although it is a preventable and treatable disease, according to the WHO reports, TB infected about 10 million cases and claimed 1.5 million lives in 2018 (2). It was estimated that the rate of active tuberculosis in pregnancy is rising in the United States (3). Most of these pregnant women lived in Africa and Southeast Asia (4). TB is a significant cause of maternal mortality during pregnancy. Pregnancy-related complications include increased spontaneous abortion rate, suboptimal weight gain in pregnancy, labor before 37 weeks of pregnancy, low birth weight, and enhanced neonatal mortality. Delay in the diagnosis of this infection is an independent factor associated with both increased obstetric morbidities and preterm labor by four- and nine-fold, respectively (5). The vertical transmission rates of TB from mother to the fetus is reported to be low, the same as low reported rates for the viruses like SARS-CoV-2 (6, 7). While TB mainly affects the lungs, about 33% of TB cases might suffer from extrapulmonary disease. The peritoneum is known as a usual extrapulmonary site of TB (8).

Herein, we present a woman with a 16-week spontaneous abortion who was referred to our emergency ward with the acute abdomen features as the first sign of tuberculosis.

2. Case History/ Examination A 20-year-old G2P1Ab1 woman who aborted spontaneously at 16-week pregnancy at home 11 days before, was referred to our hospital with general abdominal pain from 10 days ago. The abdominal pain was intensified and associated with nausea, vomiting, anemia, and massive ascites. She also had complaints of anorexia, fainting, and sweating. On the physical examination, the vital signs were reported as follows: PR=120/min, BP=90/60mmHg, RR=18/min, OT=38, and O2sat=97%, and she had abdominal distension with diffuse tenderness and guarding especially in the lower abdomen, and positive cervical motion tenderness suggestive of a hemorrhage or massive ascites. Transvaginal ultrasonography confirmed the presence of ascites (Figure 1-2). Laboratory data revealed Hb=5/6 gr/dL, white blood count of 6100, C reactive protein= 3+, and ESR=120. In addition, U/A, U/C, and PCR for COVID-19 were evaluated due to abdominal pain and coronavirus pandemic. The results of tests performed to evaluate renal function and blood levels of hepatic transaminases did not indicate unusual values.

3.Method (Differential diagnosis, investigation and treatment)

The differential diagnosis including, uterus rupture, hemoperitone, ruptured ectopic pregnancy, and ovarian cyst.

The patient subsequently underwent diagnostic laparotomy due to suspicious unsafe abortion in the history, abdominal examination, and severe anemia with the probable diagnosis of acute abdomen. Laparotomy revealed 3 liters thick yellow pus in the abdominopelvic cavity, and substantial adhesions between viscera, and several small-scale nodular implants on the surface of the peritoneal, liver, and stomach. The intestine, omentum, mesentery, uterine, ovaries, and fallopian tubes were normal except for inflammation. Irrigation of the abdominopelvic cavity and adhesiolysis were conducted. There was no specific site for the purulent ascites in exploration. Tissue samples from the peritoneum, omentum, and lymph nodes were sent to pathology and some tissue samples and ascetic fluid were sent for the microbiology, cytology, and PCR for tuberculosis examinations. The patient was treated with intravenous broad-spectrum antibiotics for 72 hours. Tissue samples of the pathological study showed granulomatous inflammation and samples for smear and culture and cytology revealed negative findings. In addition, COVID-19 PCR was reported to be negative.

According to a large amount of intraperitoneal pus without a specified source and granulomatous inflammation on pathology report (figure 3, 4), PPD test, and chest radiography were conducted with the probable diagnosis of tuberculosis. PPD was negative but CXR revealed patchy consolidations. The family history and past history of the patient's TB were negative. Meanwhile, there were no previous computed tomography (CT) scans or CXR being conducted for this patient.

4. Conclusion and results (outcome and follow-up)

Despite 72 hours of antibiotic therapy, there was no improvement in clinical condition so according to the laboratory findings and medical records, a thoracic CT scan was performed for further evaluation of the ascites etiology, which revealed bilateral pleural effusion, atelectasis, pulmonary parenchymal consolidations, and sub-pleural patchy consolidation (figure 5). Abdominopelvic ultrasonography was normal. With the possible diagnosis of tuberculosis, anti-mycobacterial therapy with isoniazid, rifampin, pyrazinamide, and ethambutol was prescribed and the patient received these drugs for 6 months until the treatment course completion. Eventually, the patient's clinical manifestations completely disappeared and the chest CT scan became normal after the treatment.

5. Discussion

Tuberculous peritonitis is a form of abdominopelvic TB that might affect the peritoneum, gastrointestinal tract, lymph nodes, or solid viscera. However, less than five percent of all cases suffer from this form of TB (8).

Due to the lack of specific presentations and laboratory results, TB has a diagnostic challenge. In addition, presentations of peritoneal TB may be similar to several other infectious or malignant diseases (9). The most prevalent symptoms include fever, weight loss, and abdominal swelling. Meanwhile, non-specified symptoms include abdominal distension, ascites, and abdominal mass. It is included in the differential diagnosis of fevers with unknown origin, peritoneal carcinomatosis, ovarian cancer, and ascites of portal hypertension or cardiac origin (10). In addition, pulmonary lesions are considered TB, or the disease may not have any evidence on the chest radiograph. Furthermore, for a number of patients, pleural effusion might be the only radiologic presentation (11). Frequent ultrasonography and computed tomographic presentations include ascites, thickening of the viscera (omental, mesenteric, peritoneal, and intestinal), adhesions between viscera, and lymphadenopathy (12, 13), the same as our patient. Laparoscopic studies reported exudative, cloudy ascites with multiple whitish nodules or tubercles with the visceral and parietal peritoneum demonstrating extensive adhesions and omental thickening (14). In our case imaging and operative findings showed ascites, extensive adhesions, omental thickening, and nodular peritoneal implants. In histological examination existence of Caseating granulomatous inflammation may be necessary for a definite diagnosis and is a hallmark of tuberculous peritonitis, as in our patient's pathology report. The culture of affected tissues or the PCR can be used to confirm the diagnosis. Nevertheless, it should be noted that culturing is not an appropriate technique for fluids obtained from the body, as there is a low chance of being detected. Patients with ascites have improvement within a few weeks of initiating treatment in 90 percent of cases (15). Its management contains a sensible combination of antitubercular therapy and surgical interventions, which may be necessary to address complications like intestinal obstruction and perforation. While it can be cured using currently available techniques, it claims several lives and infects many cases. Those who presented complications like perforation, abscess, fistula, bleeding, and/or high-grade obstruction may require surgery (11). Females with advanced levels of TB and those who simultaneously suffer from HIV infection often have the worst prognosis of TB (5). TB is a significant cause of maternal mortality during pregnancy. Several factors contribute to the pregnancy-related effects of TB, like its severity, prognosis during pregnancy, the presence of extrapulmonary infections, HIV coinfection, and time to start treatment (5). In this case, also we reported a rare combination of disseminated tuberculous peritonitis after spontaneous abortion with the feature of acute abdominal pain that underwent diagnostic laparotomy and 6 months of tuberculosis treatment.

In conclusion, Tuberculous peritonitis is a form of abdominopelvic TB that can mimic many other infectious or malignant diseases. The diagnosis is challenging for many reasons, including no family or history of TB, no

symptoms of pulmonary TB, or negative PPD, and diagnosis requires a combination of testing and medical judgment and doing an interventional test like laparotomy to confirm the diagnosis. The diagnosis could be made by a combination of CT imaging, explorative laparoscopy, evaluation of biopsies from specimens and culture, or PCR from ascite fluid or infected tissues. Also, females whose diagnosis is made at puerperium often have the worst TB prognosis, so early diagnosis is important to prevent morbidities.

Conflicts of interest

The authors declare no conflict of interests.

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Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Patient consent

Written informed consent was obtained from the patient's parents and is available for review upon request.

Author contribution

Samira Dehghani: Conceptualization, Writing – original draft

Salomeh Mohammadi: Data curation, Writing – original draft

Atefeh Mahmoudi: Investigation, Writing – original draft

Fatemeh Riyahi Zaniyani: Project administration, Writing – original draft

Sasan Shafiei: software

Afrouz Emzaei: Methodology

Yasaman Tavakoli: Writing – review & editing

Roosbeh Narimani Javid: Resources

Athena Behforouz: Supervision

References :

1. Martinez L, Warren JL, Harries AD, Croda J, Espinal MA, Olarte RAL, et al. Global, regional, and national estimates of tuberculosis incidence and case detection among incarcerated individuals from 2000 to 2019: a systematic analysis. *The Lancet Public Health*. 2023;8(7):e511-e9.
2. World Health O. Guidelines for treatment of drug-susceptible tuberculosis and patient care. 2017 update ed. Geneva: World Health Organization; 2017 2017.
3. El-Messidi A, Czuzoj-Shulman N, Spence AR, Abenhaim HA. Medical and obstetric outcomes among pregnant women with tuberculosis: a population-based study of 7.8 million births. *American journal of obstetrics and gynecology*. 2016;215(6):797.e1-e6.
4. Sugarman J, Colvin C, Moran AC, Oxlade O. Tuberculosis in pregnancy: an estimate of the global burden of disease. *The Lancet Global health*. 2014;2(12):e710-6.

5. Ormerod P. Tuberculosis in pregnancy and the puerperium. *Thorax*. 2001;56(6):494-9.
6. George C, Jeffery H, Lahra M. Infection of mother and baby. *Keeling's Fetal and Neonatal Pathology*. 2022:207-45.
7. Karimi H, Mansouri V, Rezaei N. Vertical transmission and maternal passive immunity post-SARS-CoV-2. *Future Virol*. 2023.
8. Sharma SK, Mohan A. Extrapulmonary tuberculosis. *The Indian journal of medical research*. 2004;120(4):316-53.
9. Jadvar H, Mindelzun RE, Olcott EW, Levitt DB. Still the great mimicker: abdominal tuberculosis. *AJR American journal of roentgenology*. 1997;168(6):1455-60.
10. al-Quorain AA, Facharzt, Satti MB, al-Freihi HM, al-Gindan YM, al-Awad N. Abdominal tuberculosis in Saudi Arabia: a clinicopathological study of 65 cases. *The American journal of gastroenterology*. 1993;88(1):75-9.
11. Kapoor VK. Abdominal tuberculosis. *Postgraduate Medical Journal*. 1998;74(874):459-67.
12. Rathi P, Gambhire P. Abdominal Tuberculosis. *J Assoc Physicians India*. 2016;64(2):38-47.
13. Debi U, Ravisankar V, Prasad KK, Sinha SK, Sharma AK. Abdominal tuberculosis of the gastrointestinal tract: revisited. *World journal of gastroenterology*. 2014;20(40):14831-40.
14. Ding D-C, Chu T-Y. Laparoscopic diagnosis of tuberculous peritonitis mimicking ovarian malignancy. *Taiwanese Journal of Obstetrics and Gynecology*. 2011;50(4):540-2.
15. Demir K, Okten A, Kaymakoglu S, Dincer D, Besisik F, Cevikbas U, et al. Tuberculous peritonitis—reports of 26 cases, detailing diagnostic and therapeutic problems. *European journal of gastroenterology & hepatology*. 2001;13(5):581-5.

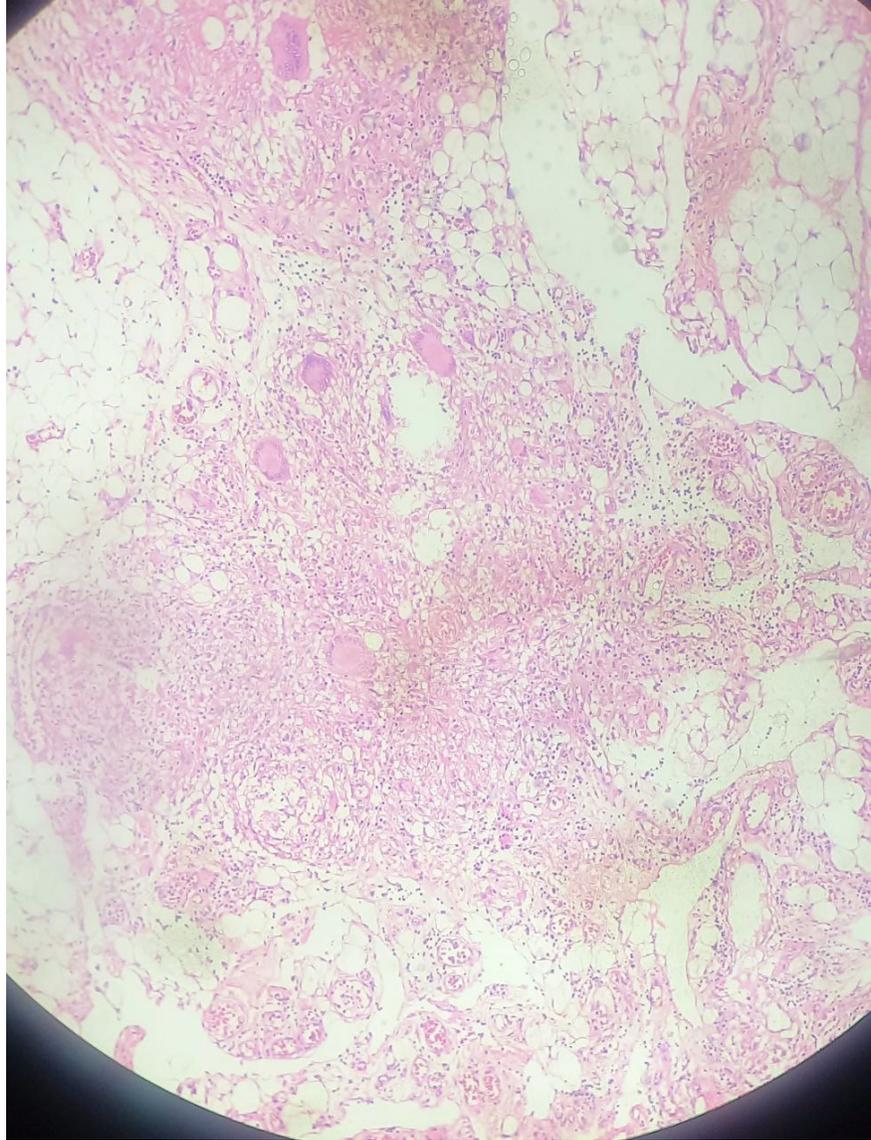
figure 1: sonography view of abdominopelvic cavity



figure 2: sonography view of abdominopelvic cavity



figure 3: granulomatous inflammation in omental specimen



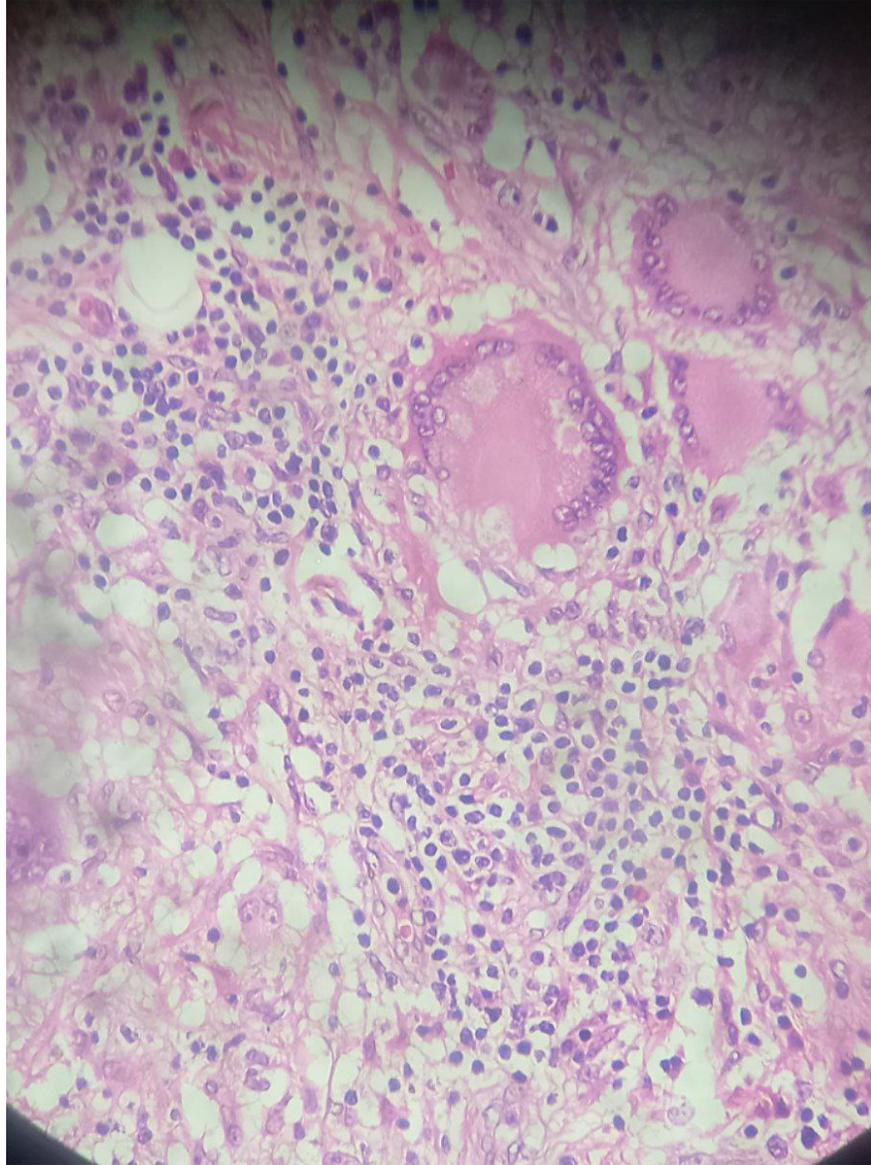
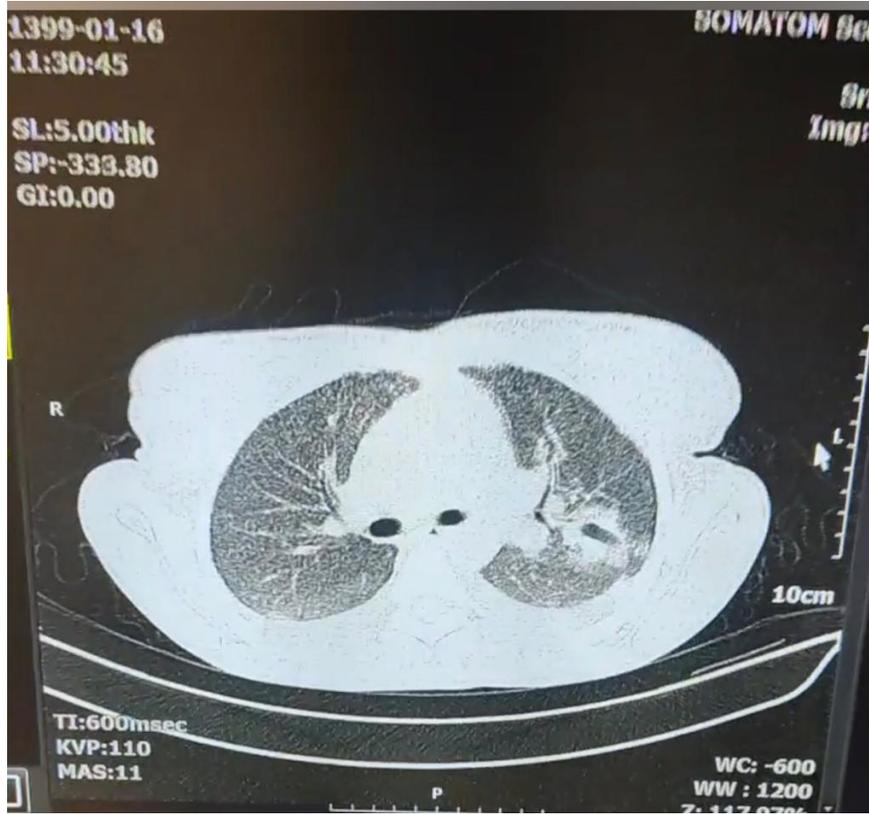


Figure 4: granulomatous inflammation in omental specimen

figure 5: Chest CT scan



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