

An Uncommon Presentation of Extrapulmonary Tuberculosis Masquerading as Ovarian Malignancy in a Young Female

Abstract

Tuberculosis (TB) is chronic granulomatous infection caused by bacteria, *Mycobacterium tuberculosis*, which primarily involves the lungs. Abdominal TB is an extrapulmonary disease which can mimic malignancy, especially in women with ascites, weight loss, and high cancer antigen-125 levels. Here, we report a case of young female, where clinical and radiological features were suggestive of ovarian malignancy. However, the pattern of uptake on flourine-18 fluorodeoxyglucose positron emission tomography/computed tomography raised the suspicion of a chronic infectious disease. The final diagnosis was confirmed as TB by cytology and started on antituberculous treatment. She had a good response and remission of lesions after 4 months of treatment.

Keywords: Abdominal tuberculosis, flourine-18 fluorodeoxyglucose positron emission tomography/computed tomography, ovarian malignancy

Introduction

Tuberculosis (TB) is a chronic granulomatous inflammation caused by *Mycobacterium tuberculosis*. India accounts for about a quarter of the global burden of TB, with approximately 2.69 million out of 10 million new cases of TB reported every year globally.^[1] Abdominal TB which constitutes up to 11% of extrapulmonary TB can infect entire gastrointestinal tract, peritoneum, lymph nodes, or solid viscera. Abdominal TB usually occurs in four forms: lymph nodal TB, peritoneal TB, gastrointestinal TB, and visceral TB involving the solid organs. Of these, the ileocecal region is the most common infected site.^[2] Sometimes, there can be difficulty in differentiating abdominal TB from other malignancies, especially in females clinically and on conventional imaging.^[3]

Flourine-18 fluorodeoxyglucose positron emission tomography/computed tomography (F-18 FDG PET/CT) imaging, an established modality for evaluation of several malignancies, also shows increased uptake in inflammatory cells due to high metabolism and glycolytic activity.^[4] We report a case of young female, with abdominal mass and ascites

suspected to be ovarian malignancy by ultrasonography and CT. F-18 FDG PET/CT also showed an increased activity. However, finally diagnosed with abdominal TB by cytology and had a good response after antituberculosis treatment (ATT) for 4 months.

Case Report

A 20-year-old nulliparous female was presented with pain and tenderness of lower abdomen for 1-month duration. There was no history of dysuria, pyuria, hematuria, diarrhea, constipation in the patient. Her menstrual cycles were regular with normal blood flow. There was no history of fever, vaginal discharge, chronic illness, chronic cough, and significant weight loss. On physical examination, there was tenderness over abdomen with no other abnormal finding. Laboratory results reported no hematological or biochemical abnormalities.

Ultrasonography of abdomen reported abdominal free liquid accumulation with septations and multiple implants in peritoneal surfaces. Furthermore, the scan revealed multiple sub cm size mesenteric and omental nodules and 4 cm × 2 cm nodular lesion in left adnexa on CT scan. Serum cancer antigen (CA)-125 levels was elevated-91 IU/ml (normal range-<35 IU/ml). In view of suspected ovarian malignancy,

**Sankari Kommi,
Nimmagadda Ajit,
Kommu
Bikshapathy
Sricharan,
Rollapeta Ramya
Priya, Krishna
Mohan VS,
Tekchand Kalawat**

Department of Nuclear
Medicine, Sri Venkateswara
Institute of Medical Sciences,
Tirupati, Andhra Pradesh, India

Address for correspondence:

Dr. Tekchand Kalawat,
Department of Nuclear
Medicine, Sri Venkateswara
Institute of Medical Sciences,
Tirupati, Andhra Pradesh, India.
E-mail: kalawat.svims
@gmail.com

Received: 27-02-2021

Revised: 02-07-2021

Accepted: 31-08-2021

Published: 15-12-2021

Access this article online

Website: www.ijnm.in

DOI: 10.4103/ijnm.ijnm_28_21

Quick Response Code:



How to cite this article: Kommi S, Ajit N, Charan KB, Priya RR, Mohan VS, Kalawat T. An uncommon presentation of extrapulmonary tuberculosis masquerading as ovarian malignancy in a young female. Indian J Nucl Med 2021;36:437-40.

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the patient was advised for F-18 FDG PET/CT. F-18 FDG PET/CT showed intense uptake in lower cervical and mediastinal lymph nodes, largest measuring 1.1 cm × 1.9 cm with maximum standard uptake value (SUV) of 8.9. Along with these, metabolically quiescent gross ascites, multiple FDG avid peritoneal deposits with nodularity were seen with maximum SUV:12.2 [Figure 1]. Histopathological correlation of the lesions was advised. Fine needle aspiration cytology from omental mass was reported as granulomatous inflammatory cells with giant cell reaction. The ascitic fluid cytology showed no malignant cells. She was started on ATT. The patient improved clinically on treatment. A follow-up

F-18 FDG PET/CT was done 4 months after starting on ATT, for response assessment and showed complete metabolic and morphological response [Figure 2].

Discussion

Abdominal TB is one of the common variants of extrapulmonary TB. In general, abdominal lesions of mycobacterium are result of hematogenous spread or lymphatic spread of primary pulmonary focus. Abdominal TB usually presents with vague, nonspecific symptoms which make the diagnosis of the condition sometimes challenging. The most common presenting symptoms of

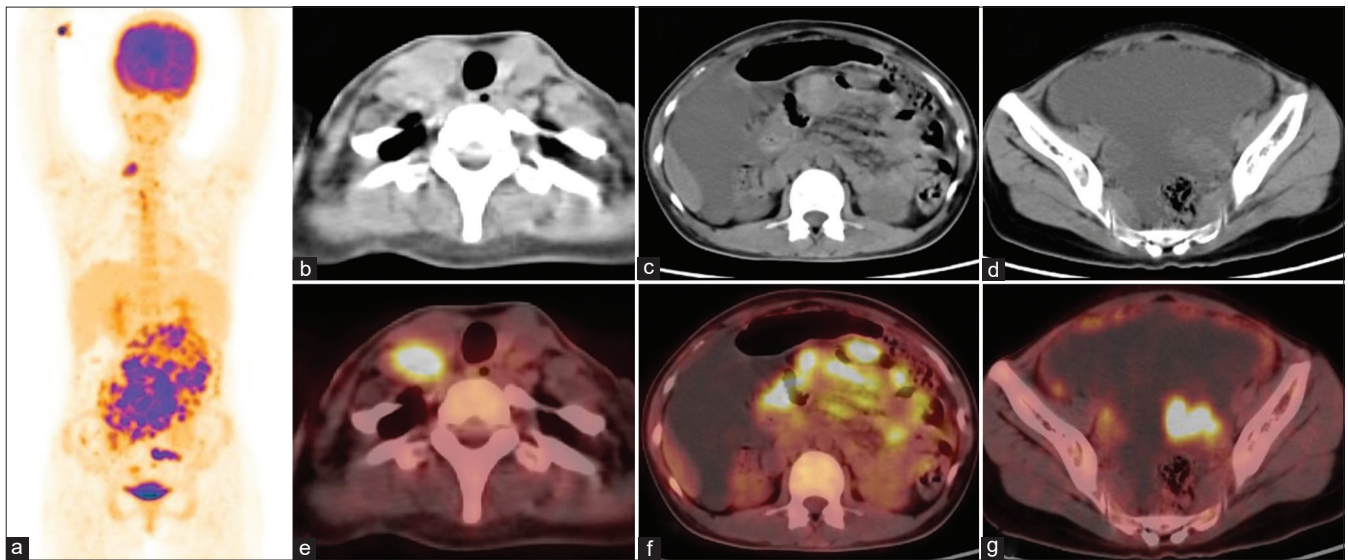


Figure 1: Flourine-18 fluorodeoxyglucose positron emission tomography/computed tomography maximum intensity projection image (a) and axial computed tomography of neck (b), abdomen (c) and pelvis (d) along with fused positron emission tomography/computed tomography images of neck (e), abdomen (f) and pelvis (g) showing multiple fluorodeoxyglucose avid cervical, mediastinal, abdominal and pelvic lymphadenopathy along with multiple fluorodeoxyglucose avid omental, peritoneal deposits with ascites

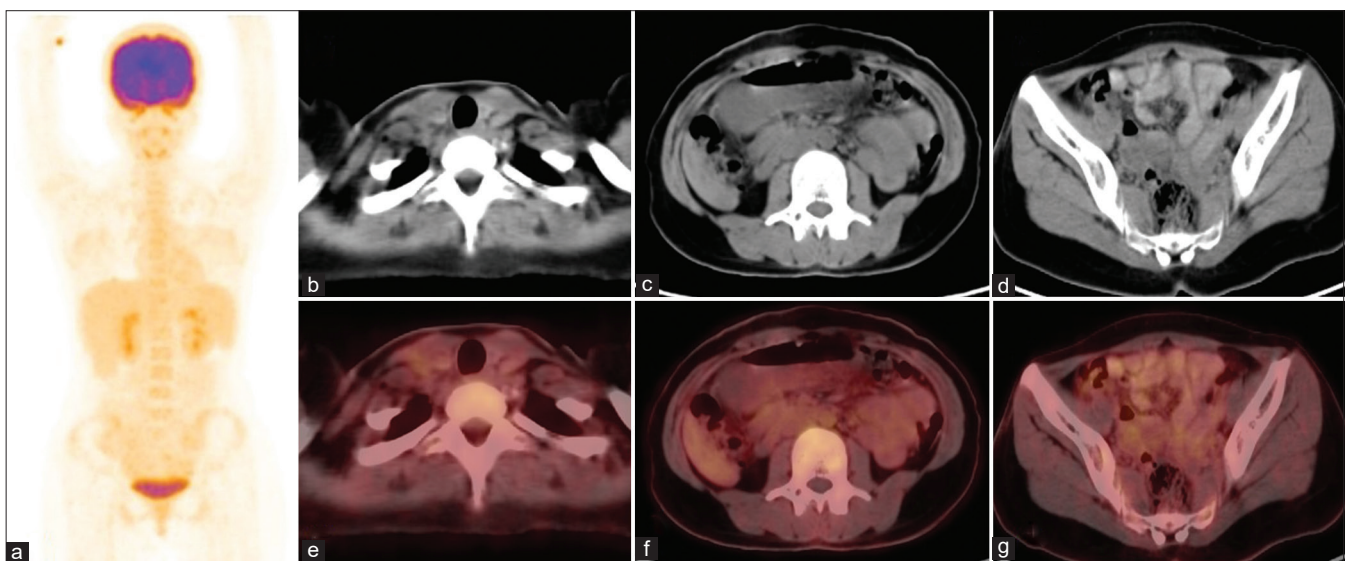


Figure 2: Flourine-18 fluorodeoxyglucose positron emission tomography/computed tomography maximum intensity projection image (a) and axial computed tomography of neck (b), abdomen (c) and pelvis (d) along with fused positron emission tomography/computed tomography images of neck (e), abdomen (f) and pelvis (g) after 4 months of antituberculosis treatment showing complete metabolic and morphological response

abdominal TB are abdominal pain (90%), followed by weight loss, fever, abdominal mass, and ranges of another symptoms including vomiting, constipation, abdominal tenderness, and signs of ascites and peritonitis.^[2]

Diagnosis is made with the help of clinical history, positive microbiological cultures, histological confirmation, positive tuberculin test, serological analyses, X-ray chest, and CT. Histopathological examination is the gold standard for diagnosis. Early diagnosis with prompt treatment is essential for a good prognosis. Due to nonspecific presentation and variable anatomical location, diagnosis of abdominal TB may be sometimes difficult.^[5]

In our case, the patient was initially suspected for ovarian cancer due to high CA-125 levels and omental deposits. Apart from TB and ovarian cancer, elevated CA-125 with abdominal lesions can also be seen in other malignant conditions such as breast cancer, mesothelioma, Non-Hodgkin's lymphoma, gastric cancer leiomyoma, and leiomyosarcoma of gastrointestinal origin. CA-125 levels have also been found elevated in benign conditions such as endometriosis, pregnancy, ovulatory cycles, liver diseases, and congestive heart failure.^[6] CA-125, the common tumor marker of ovarian cancer, is also elevated in patients with pulmonary and extrapulmonary TB.^[7]

Numerous case reports and case series showed significantly elevated CA-125 in patients diagnosed with abdominal TB. Similarly, increased level of CA-125 was found in our patient. Meanwhile, decrease of serum CA-125 in patient with abdominal TB receiving course of anti-TB drug indicating some value of this biomarker in the evaluation of TB treatment. Some of the women who had abdominal TB can be misdiagnosed for ovarian carcinoma because of ascites and high levels of serum CA-125.^[8-11]

F-18 FDG PET/CT scan done in the patient showed increased activity in mediastinal lymph nodes and omental deposits with increased nodularity. In malignancy, FDG accumulates in cells based on high level of metabolism and glycolytic activity. In infection or inflammatory condition, high glycolytic activity of the cells is due to neutrophils and macrophages that have a high expression of glucose transporter 1 (GLUT-1) and GLUT-3, which induced high F-18 FDG uptake. Hence, F-18 FDG PET/CT may not differentiate malignancy and inflammation.^[12]

Tian *et al.* reported 3 cases with abdominal mass diagnosed as malignancy by conventional imaging and FDG PET/CT also showed an increased activity and were diagnosed as multisite abdominal TB.^[13]

Chen *et al.* reported a case with elevated serum CA-125 with abdominal hypermetabolic foci that mimicked peritoneal carcinomatosis and laparoscopic biopsy of the peritoneum and omentum showed chronic inflammation and acid-fast bacilli.^[14] Kattan *et al.* reported a case of middle-aged woman where conventional imaging and

PET CT were inconclusive with peritoneal nodules, however, Histopathological examination (HPE) confirmed *M. tuberculosis*.^[15] Similar findings were also reported by Takalkar *et al.* in a case report of a 29-year-old woman with abdominal pain.^[16]

The definitive diagnosis of malignancy or TB is dependent on histopathological examination. In our case cytology from omental deposits was reported as granulomatous pathology. F-18 FDG PET/CT is not only useful in initial evaluation but also evaluation of response to therapy.^[17]

After confirmation of diagnosis, the patient was started on anti-TB treatment and after 4 months of treatment follow-up, F-18 FDG PET/CT showed complete remission of lesions.

Conclusion

Ovarian cancer is one of the primary differential diagnoses in a patient with abdominal lesions, ascites associated with high CA-125 blood levels. However, diagnosis of abdominal TB should always be considered in young female patients, especially in endemic area of TB with F-18 FDG PET/CT as a tool for diagnostic and therapeutic response evaluation.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. World Health Organization. Global Tuberculosis Report 2019. Geneva, Switzerland: World Health Organization; 2019.
2. Rathi P, Gambhire P. Abdominal tuberculosis. J Assoc Physicians India 2016;64:38-47.
3. Patel SM, Lahange KK, Desai AD, Dave KS. Ovarian carcinoma or abdominal tuberculosis?-A diagnostic dilemma: Study of fifteen cases. J Obstet Gynaecol India 2012;62:176-8.
4. Harkirat S, Anana SS, Indrajit LK, Dash AK. Pictorial essay: PET/CT in tuberculosis. Indian J Radiol Imaging 2008;18:141-7.
5. Engin G, Acunaş B, Acunaş G, Tunaci M. Imaging of extrapulmonary tuberculosis. Radiographics 2000;20:471-88.
6. Scholler N, Urban N. CA125 in ovarian cancer. Biomark Med 2007;1:513-23.
7. Yilmaz A, Ece F, Bayramgürler B, Akkaya E, Baran R. The value of CA 125 in the evaluation of tuberculosis activity. Respir Med 2001;95:666-9.

8. Thakur V, Mukherjee U, Kumar K. Elevated serum cancer antigen 125 levels in advanced abdominal tuberculosis. *Med Oncol* 2001;18:289-91.
9. Boss JD, Shah CT, Oluwole O, Sheagren JN. TB peritonitis mistaken for ovarian carcinomatosis based on an elevated CA-125. *Case Rep Med* 2012;2012:215293.
10. Koc S, Beydilli G, Tulunay G, Ocalan R, Boran N, Ozgul N, *et al.* Peritoneal tuberculosis mimicking advanced ovarian cancer: A retrospective review of 22 cases. *Gynecol Oncol* 2006;103:565-9.
11. Le Thi Huong Du, Mohattane H, Piette JC, Bogdan A, Auzeby A, Touitou Y, *et al.* Specificity of CA 125 tumor marker. A study of 328 cases of internal medicine. *Presse Med* 1988;17:2287-91.
12. Vorster M, Sathekge MM, Bomanji J. Advances in imaging of tuberculosis: The role of 18FFDG PET and PET/CT. *Curr Opin Pulm Med* 2014;20:287-93.
13. Tian G, Xiao Y, Chen B, Guan H, Deng QY. Multi-site abdominal tuberculosis mimics malignancy on 18F-FDG PET/CT: Report of three cases. *World J Gastroenterol* 2010;16:4237-42.
14. Chen CJ, Yao WJ, Chou CY, Chiu NT, Lee BF, Wu PS. Peritoneal tuberculosis with elevated serum CA125 mimicking peritoneal carcinomatosis on F-18 FDG-PET/CT. *Ann Nucl Med* 2008;22:525-7.
15. Kattan J, Haddad FG, Menassa-Moussa L, Kesrouani C, Daccache S, Haddad FG, *et al.* Peritoneal tuberculosis: A forsaken yet misleading diagnosis. *Case Rep Oncol Med* 2019;2019:5357049:1-4.
16. Takalkar AM, Bruno GL, Reddy M, Lilien DL. Intense FDG activity in peritoneal tuberculosis mimics peritoneal carcinomatosis. *Clin Nucl Med* 2007;32:244-6.
17. Sood A, Mittal BR, Modi M, Chhabra R, Verma R, Rana N, *et al.* 18F-FDG PET/CT in tuberculosis: Can interim PET/CT predict the clinical outcome of the patients? *Clin Nucl Med* 2020;45:276-82.