Case Report

Peritoneal Lymphomatosis Mimicking Peritoneal Carcinomatosis from Ovarian Malignancy on F-18 Fluorodeoxyglucose Positron Emission Tomography/Computed Tomography

Abstract

Peritoneal lymphomatosis is relatively uncommon cause of diffuse malignant peritoneal disease, and differentiating it from other causes of diffuse peritoneal disease such as peritoneal carcinomatosis is often difficult on imaging. Common findings observed in peritoneal lymphomatosis in contrast to other etiologies include frequent nodal involvement and splenomegaly. We present a case of diffuse peritoneal disease along with ovarian lesions in the absence of abdominal lymphadenopathy or splenomegaly on fluorodeoxyglucose positron emission tomography–computed tomography in the setting of elevated cancer antigen-125 levels, mimicking primary ovarian malignancy causing peritoneal carcinomatosis, which was finally proven to be lymphoma.

Keywords: *Diffuse large B-cell lymphoma, F-18 fluorodeoxyglucose positron emission tomography/computed tomography, peritoneal carcinomatosis, peritoneal lymphomatosis*

Raja Senthil, Vadavattathu Padmanabhan Gangadharan[1], Arun Ramachandran Nair Visakh, Pushpa Mahadevan[2], Thara Pratap[3]

Departments of Nuclear Medicine and PET/CT, [1]Medical Oncology, [2]Pathology and [3]Radiology, VPS Lakeshore Hospital, Kochi, Kerala, India

Introduction

Diffuse peritoneal disease is one of the commonly encountered findings in oncologic imaging. Peritoneal carcinomatosis is the most common cause, usually spreading from ovarian, colorectal, gastric, or breast cancer.[1] Other causes include peritoneal lymphomatosis, primary peritoneal tumors, and peritoneal tuberculosis.[2] Although it is often difficult to differentiate each other on imaging, early diagnosis is essential as the prognosis and management differ significantly.[3] Lymphoma being a great mimicker can rarely present as diffuse infiltration of the peritoneum.[4] Common findings observed in peritoneal lymphomatosis in contrast to other etiologies include frequent nodal involvement and splenomegaly.[2]

Case Report

A 45-year-old female presented with abdominal distention for 1 month duration. She was found to have diffuse irregular omental and mesenteric thickening, bilateral enlarged ovaries, and pleural effusion on computed tomography (CT) scan. Cancer antigen (CA)-125 level was elevated (356 IU/ml) and carcinoembryonic antigen was normal (<0.2 ng/ml). Clinically, metastatic ovarian cancer was considered and referred for whole-body F-18 fluorodeoxyglucose positron emission tomography–CT (FDG PET CT) [Figure 1a-g], which showed intensely FDG-avid diffuse soft-tissue thickening in the peritoneum, omentum, mesentery, along the serosal surface of small and large bowel loops, and FDG-avid lesions in both adnexae (white arrows). In addition, FDG-avid soft-tissue lesions were also seen in anterior abdominal wall and left parasternal region along with metabolically inactive bilateral mild pleural effusion. No splenomegaly or significant lymphadenopathy was noted, except for few FDG nonavid small nonspecific retroperitoneal lymph nodes. In view of the presence of ovarian lesions with high CA-125 levels in the absence of significant lymphadenopathy or splenomegaly, the possibility of metastatic ovarian cancer was raised. Omental biopsy showed features of lymphoma [Figure 2a and b]. Immunohistochemistry showed positivity for CD 20 [Figure 2c], CD 10, bcl2, and cMyc and negativity for TdT, cyclin D1, and CD 30; admixed CD3-positive T-cells were also seen and approximately 30% of

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Address for correspondence:
Dr. Raja Senthil, Department of Nuclear Medicine and PET/CT, VPS Lakeshore Hospital, Kochi - 682 040, Kerala, India. E-mail: senthilrajapgi@yahoo.com

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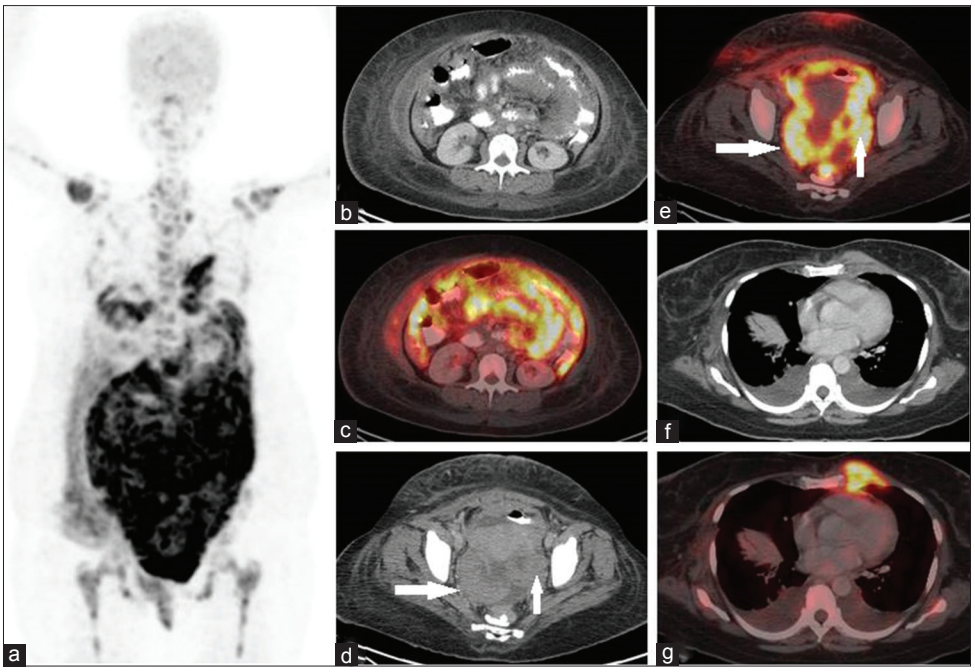

Figure 1: Whole-body F-18 fluorodeoxyglucose positron emission tomography–computed tomography (a, maximum intensity projection image), shows intensely fluorodeoxyglucose-avid diffuse soft-tissue thickening in the peritoneum, omentum, mesentery, along the serosal surface of small and large bowel loops (b and c) and fluorodeoxyglucose-avid lesions in both adnexae (d and e, white arrows). In addition, fluorodeoxyglucose-avid soft-tissue lesions were also seen in the left parasternal region along with metabolically inactive bilateral pleural effusion (f and g)

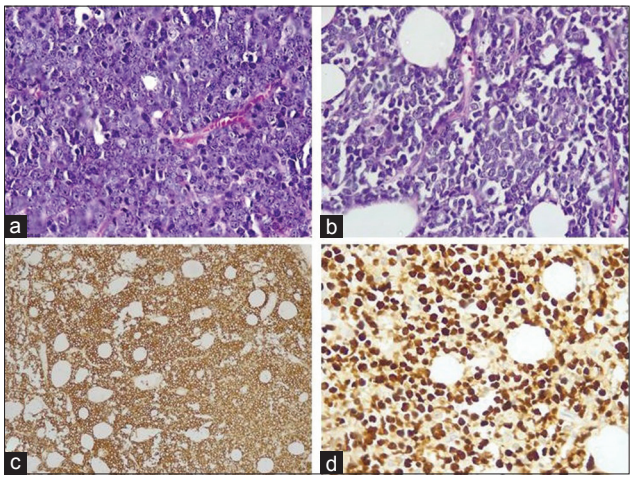

Figure 2: Omental biopsy (H and E stain, ×40) showed high-grade lymphomatous cells (a), infiltrating fat (b). Immunohistochemical examination showed positivity for CD20 cells (c). Lymphomatous cells also show high proliferation rate with Ki67 index of approximately 80% (d)

cells were bcl6 positive with Ki 67 index of approximately 80% [Figure 2d], suggestive of diffuse large B-cell lymphoma-Germinal center origin–double-expressor type.

Discussion

Causes of diffuse peritoneal diseases include peritoneal carcinomatosis, peritoneal lymphomatosis, malignant peritoneal mesothelioma, diffuse peritoneal leiomyomatosis, splenosis implants, peritoneal tuberculosis, and IgG4-related disease.[2,5,6] Since most of them present with nodular or diffuse peritoneal thickening with invasion of omentum (caking) and mesentery, it is often difficult to differentiate each other on imaging. However, accurate early diagnosis is essential as the prognosis and management of each condition vary significantly.[3]

Findings which favor peritoneal lymphomatosis on imaging are frequent lymph nodal involvement (particularly bulky, nonobstructing, homogeneous retroperitoneal or preaortic lymphadenopathy, elevating the aorta off the spine "floating aorta sign," or encasing the mesenteric vasculature the "sandwich" sign) and splenomegaly.[2,7,8] The presence of any lesions in possible primary sites such as ovary, colorectum, pancreas, stomach, or breast would usually suggest peritoneal carcinomatosis, where lymphadenopathy if present is locoregional with respect to the primary site and may show heterogeneous enhancement/necrotic changes on CT.[2]

In our case, possibility of metastatic ovarian cancer was raised due to the presence of ovarian lesions with increased CA-125 levels in the absence of lymphadenopathy or splenomegaly. Even though CA-125, a tumor marker that is most commonly associated with ovarian cancer, it may be increased in various benign conditions such as pregnancy, pelvic inflammatory disease, endometriosis, and liver cirrhosis as well as other malignancies arising from endometrium, breast, lung, and gastrointestinal tract.[9,10] In addition, it is also important to note that CA-125 is a glycoprotein secreted by normal coelomic epithelium, such as the peritoneum and pleura. Hence, it can be elevated in various benign and malignant conditions that

involve the coelomic epithelium, including peritoneal lymphomatosis.[11,12]

This case emphasizes the fact that the presence of ovarian lesions and elevated CA-125 levels in patients with diffuse peritoneal disease does not exclude the possibility of lymphoma, even in the absence of supporting findings like lymphadenopathy or splenomegaly.

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.

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Conflicts of interest

There are no conflicts of interest.

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