

¹⁸F-FDG PET/CT Imaging in a Patient with a Rare Diagnosis of Sarcomatoid Malignant Peritoneal Mesothelioma

¹⁸F -FDG PET/BT İle Görüntülenen Nadir Bir Sarkomatoid Malign Peritoneal Mezotelyoma Olgusu

Özge Vural Topuz¹, Ümit Aksu ¹, Hüseyin Karatay², Nur Büyükpınarbaşı²

¹Health Sciences University, Başakşehir Çam and Sakura City Hospital, Department of Nuclear Medicine

²Health Sciences University, Başakşehir Çam and Sakura City Hospital, Department of Pathology

ABSTRACT

Malignant peritoneal mesothelioma is an uncommon but deadly disease arising from serosal surfaces of the peritoneum. Asbestos exposure is the most recognized risk factor. We report a case of diffuse, sarcomatoid malignant peritoneal mesothelioma who presented to the hospital with abdominal pain. The patient had an abdominal MRI scan as initial scanning which demonstrated nonspecific findings suspected of peritoneal carcinomatosis. The patient was admitted to our department for the metabolic characterization of the lesions with ¹⁸F-FDG PET/CT imaging and the diagnosis of the primary malignancy. ¹⁸F-FDG PET/CT imaging revealed diffusely increased metabolic activity throughout the peritoneum and the histopathological features were compatible with sarcomatoid malignant peritoneal mesothelioma.

Keywords: PET/CT, ¹⁸F-FDG, malignant peritoneal mesothelioma

Received: 08.06.2022

Accepted: 08.31.2022

ÖZET

Malign peritoneal mezotelyoma, peritonun serozal yüzeylerinden kaynaklanan nadir fakat ölümcül bir hastalıktır. Asbest maruziyeti en çok bilinen risk faktörüdür. Karın ağrısı ile hastaneye başvuran hastanın MR görüntülerinde peritoneal karsinomatozis şüphesi uyandıran non spesifik bulgular saptandı. Daha sonra hasta batındaki lezyonların metabolik karakterizasyonu ve primer malignite araştırılması amacı ile ¹⁸F -FDG PET/BT görüntüleme için birimize yönlendirildi. ¹⁸F -FDG PET/BT görüntülemeye periton boyunca diffüz artmış metabolik aktivite saptandı ve histopatolojik özellikler sarkomatoid malign peritoneal mezotelyoma ile uyumlu olarak bulundu.

Anahtar Sözcükler: PET/BT, ¹⁸F –FDG, Malign peritoneal mezotelyoma

Geliş Tarihi: 06.08.2022

Kabul Tarihi: 31.08.2022

ORCID IDs: Ö.V.T.0000-0001-7197-5866,Ü.A.0000-0002-8234-2252,H.K.0000-0002-4217-2834,N.B.0000-0002-1784-6665

Address for Correspondence / Yazışma Adresi: Özge Vural Topuz, MD Başakşehir Çam and Sakura City Hospital, Department of Nuclear Medicine, Başakşehir/İstanbul E-mail: ozgevuraltopuz@gmail.com

©Telif Hakkı 2022 Gazi Üniversitesi Tıp Fakültesi - Makale metnine <http://medicaljournal.gazi.edu.tr/> web adresinden ulaşılabilir.

©Copyright 2022 by Gazi University Medical Faculty - Available on-line at web site <http://medicaljournal.gazi.edu.tr/>

doi:<http://dx.doi.org/10.12996/gmj.2022.100>

INTRODUCTION

Malignant mesothelioma (MM) is a rare and highly aggressive tumor arising from serous surfaces and occurs in the pleura, pericardium and peritoneum. About 75% of all cases involve the pleura, peritoneal mesothelioma as the second most frequent site has an incidence of one per million and accounts for 10–30% of all mesotheliomas (1).

CASE REPORT

A 65-year-old male patient was admitted to the hospital with non-specific abdominal symptoms. He was not smoking but a detailed social history revealed that he had been exposed to asbestos during ten years of life time period. The patient had an abdominal MRI scan as initial scanning which demonstrated nonspecific findings suspected of peritoneal carcinomatosis. Colonoscopy revealed normal findings. With the suspicion of peritoneal carcinomatosis the patient was admitted to our department for the metabolic characterisation of the lesions with ^{18}F -fluorodeoxyglucose positron emission tomography/computed tomography (^{18}F -FDG PET/CT) imaging and the diagnosis of the primary malignancy (Figure 1).

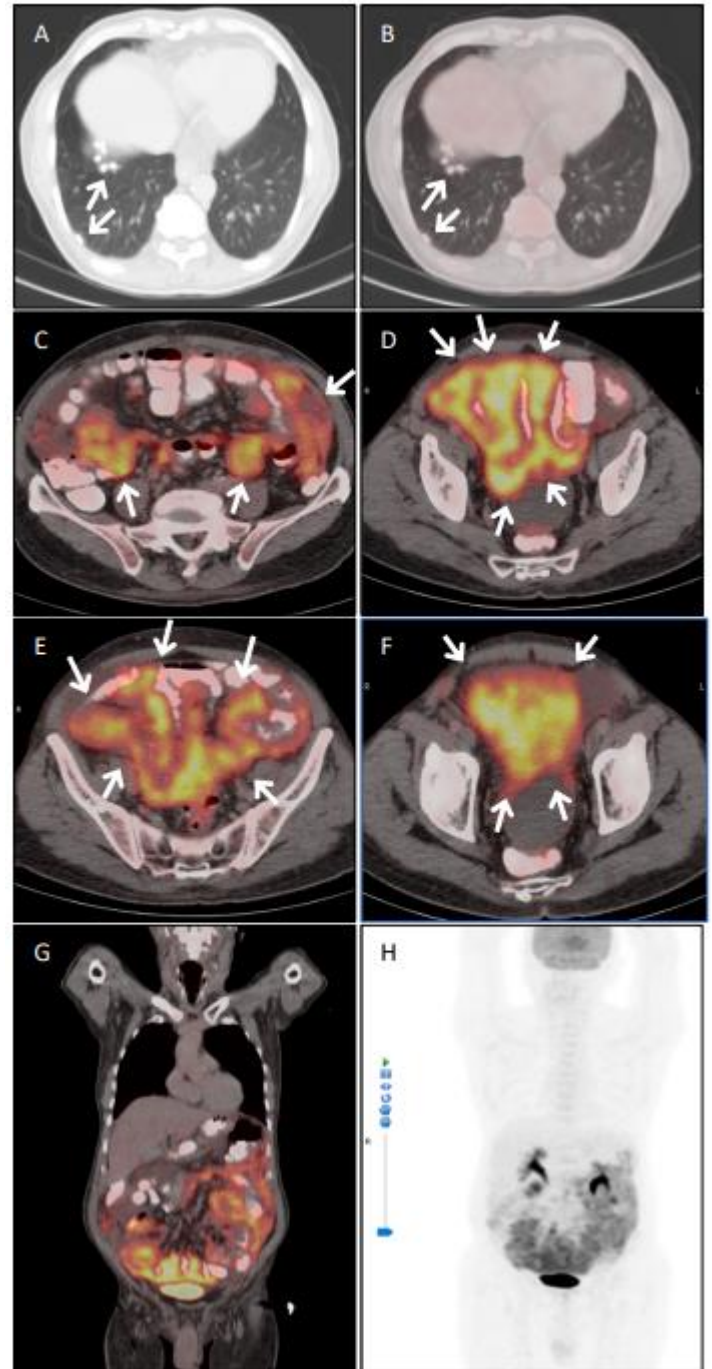


Figure 1: The axial CT and PET/CT images of the chest (A,B) show calcified nodules in the basal segments of the lower lobe of the right lung. The axial PET/CT images of the abdomen (C,D,E,F), coronal PET/CT image (G) and whole body maximum intensity projection (MIP) (H) demonstrated diffuse intense FDG uptake (SUVmax:6,9) on all intestinal serosal surfaces (white arrows)

Histopathological examination of the tru-cut biopsy revealed a malignant tumor composed of eosinophilic, plump, spindle cells with prominent nucleoli. Immunohistochemistry showed positive reactions with cytokeratin 7 and calretinin. Mesothelin, HBME-1, WT-1 were focally positive. No reactions were observed in CD34, C-kit, Dog-1, TTF-1, or P40. A diagnosis of mesothelioma, sarcomatoid variant was rendered (Figure 2)

DISCUSSION

As in the case of pleural MM there is a strong relationship between asbestos exposure and peritoneal mesothelioma development. The disease is more common in men than women (2). Although localized MM may occur, most patients have diffuse peritoneal involvement. It usually remains confined to the abdominal cavity throughout its course. We know that calcified pleural plaques can be observed in individuals with asbestos exposure(3). In our case there was no evidence of pleural involvement but there were calcified nodules in the lungs parenchyma.

The correct diagnosis of malignant peritoneal mesothelioma is often delayed because of non-specific clinical symptoms, various presentations and the rarity of the disease. It may be misdiagnosed with another disease like neoplasm originating from other abdominal organs (4). Since the diagnosis and treatment of malignant peritoneal mesothelioma is challenging, PET, which is widely applied for the diagnosis of various cancers also play an important role in the preoperative imaging and staging of the disease (1,5). There are few articles showing the role ^{18}F -FDG PET/CT in the diagnosis of peritoneal mesothelioma (6), the interests of reporting this case was the rarity of the sarcomatoid histological type of this neoplasm and also its uncommon presentation as peritoneal carcinomatosis.

Similar to pleural MM, malignant peritoneal mesothelioma is classified into three major histological subtypes: epithelioid (most common), sarcomatoid and mixed (biphasic) (7). Sarcomatoid malignant peritoneal mesothelioma is the rarest and most lethal form, it has poor prognosis and limited therapeutic options (8).

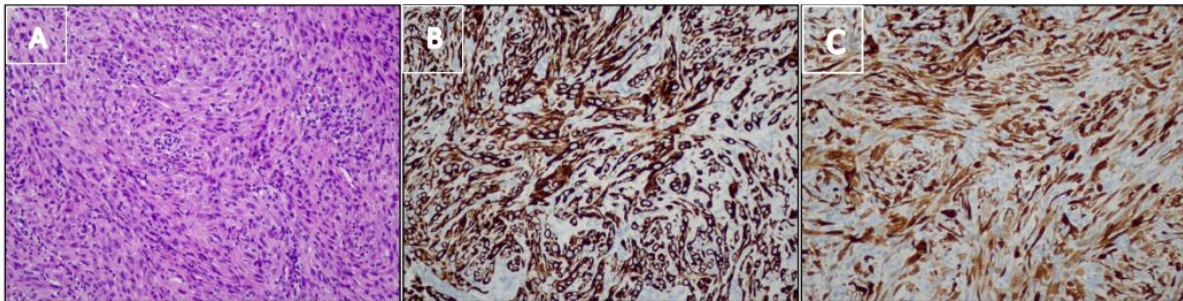


Figure 2. (A) Spindled tumor cells with eosinophilic cytoplasm and prominent nucleoli (H&E, 200x) (B) Diffuse cytokeratin 7 positivity (CK7, 200x) (C) Nuclear and cytoplasmic calretinin positivity in the majority of the tumor cells (Calretinin, 200x).

Conflict of interest

No conflict of interest was declared by the authors.

REFERENCES

1. Zha BS, Flanagan M, Coulson C, Garvin KW. Difficult to Identify: Malignant Primary Peritoneal Mesothelioma. *Am J Med.* 2015 Nov;128(11):1191-4.
2. Notue YA, Mbessoh UI, Nganwa G, et al. Sarcomatoid malignant peritoneal mesothelioma presenting as a localized mesenteric tumor with no previous asbestos exposure. *J Surg Case Rep.* 2020;2020(10):rjaa419.
3. Kindler HL. Peritoneal mesothelioma: the site of origin matters. *Am Soc Clin Oncol Educ Book.* 2013:182-8.
4. Frontario SC, Loveitt A, Goldenberg-Sandau A, Liu J, Roy D, Cohen LW. Primary Peritoneal Mesothelioma Resulting in Small Bowel Obstruction: A Case Report and Review of Literature. *Am J Case Rep.* 2015;16:496-500.
5. Cao S, Jin S, Cao J, et al. Advances in malignant peritoneal mesothelioma. *Int J Colorectal Dis.* 2015;30(1):1-10.
6. Cao Q, Lu M, Heath J, et al. ^{18}F -FDG PET/CT in a recurrent diffuse malignant peritoneal mesothelioma. *Clin Nucl Med.* 2012;37(5):492-494.
7. Sato T, Nakanishi H, Akao K, et al. Three newly established immortalized mesothelial cell lines exhibit morphological phenotypes corresponding to malignant mesothelioma epithelioid, intermediate, and sarcomatoid types, respectively. *Cancer Cell Int.* 2021;21(1):546.
8. Notue YA, Mbessoh UI, Nganwa G, Pambe JN, Mefire AC, Moifo B, Sando Z. Sarcomatoid malignant peritoneal mesothelioma presenting as a localized mesenteric tumor with no previous asbestos exposure. *J Surg Case Rep.* 2020 Oct 28;2020(10):rjaa419.