



A Rare Malignancy; Primary Peritoneal Serous Carcinoma in Men with ¹⁸F-FDG PET/CT and Histopathology

Nadir Bir Olgu; Histopatoloji ve ¹⁸F-FDG PET/BT'de Erkek Primer Peritoneal Seröz Karsinomu

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Abstract

Primary peritoneal serous carcinoma (PPSC) is a rare malignancy that mostly affects women. In males, there are only few reports in the literature. ¹⁸F-fluorodeoxyglucose (¹⁸F-FDG) positron emission tomography/computed tomography (PET/CT) is useful for evaluating the origin of the tumor, its extent, and distant metastasis. Moreover, ¹⁸F-FDG PET/CT was helpful in distinguishing between PPSC and peritoneal carcinomatosis. We present a case of PPSC on ¹⁸F-FDG PET/CT in a male with histopathological correlation.

Keywords: Peritoneal tumour, primary peritoneal serous carcinoma, ¹⁸F-FDG PET/CT

Öz

Primer peritoneal seröz karsinom (PPSK) erkeklerde oldukça nadir görülen bir malignite olup ¹⁸F-florodeoksiglukoz (¹⁸F-FDG) pozitron emisyon tomografisi/bilgisayarlı tomografi (PET/BT) tümörün primer/sekonder ayırımında, hastalık yaygınlığının belirlenmesinde rol oynamaktadır. Tanıda histopatoloji ve görüntüleme birlikte değerlendirilir. Bu olguda PPSK tanısı olan bir erkek hastanın PET/BT bulgularını ve patolojisini sunduk.

Anahtar kelimeler: Peritoneal tümör, primer peritoneal seröz karsinom, ¹⁸F-FDG PET/BT

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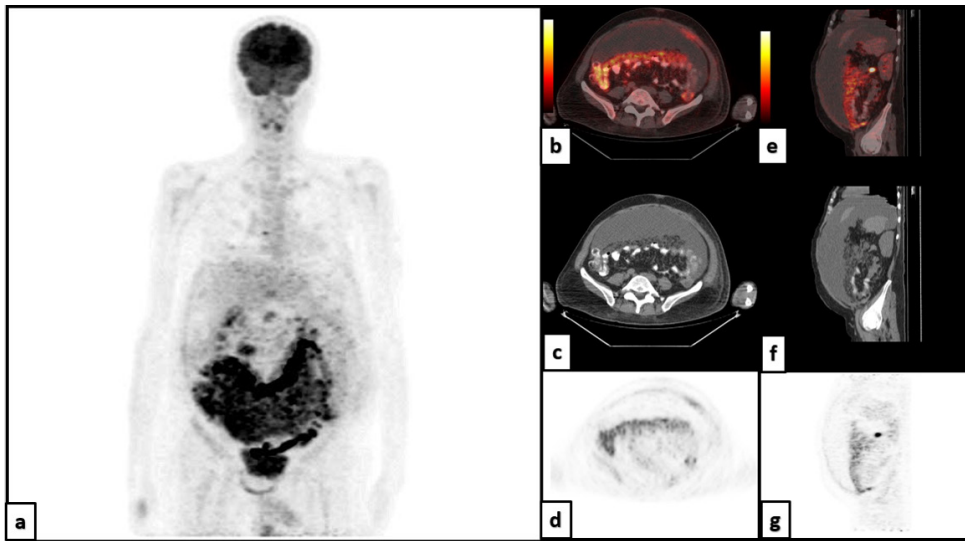


Figure 1. A 60-year-old man was admitted to the emergency department with progressive abdominal distention, and clinical assessment revealed the presence of ascites. Abdominal computed tomography showed peritoneal thickenings suggestive of peritoneal carcinomatosis. While undergoing gastro-colonoscopy and a testicular examination, the patient was referred to the nuclear medicine department for ^{18}F -fluorodeoxyglucose (^{18}F -FDG) positron emission tomography/computed tomography (PET/CT) and the radiology department for abdominal CT and magnetic resonance imaging (MRI) due to clinical suspicion of metastases. Maximum intensity projection (a) images, transaxial (b, c, d) sagittal (e, f, g) slices of fusion, and CT and PET/CT images of the abdomen showed multiple mild to moderate hypermetabolic nodular peritoneal thickening in the omentum and heterogeneity of the transverse mesocolon highly suggestive of peritoneal cancer with maximum standardized uptake value: 6.3. There was no other pathological finding in the rest of the body. True-cut biopsy was performed for the diagnosis and management of the therapy.

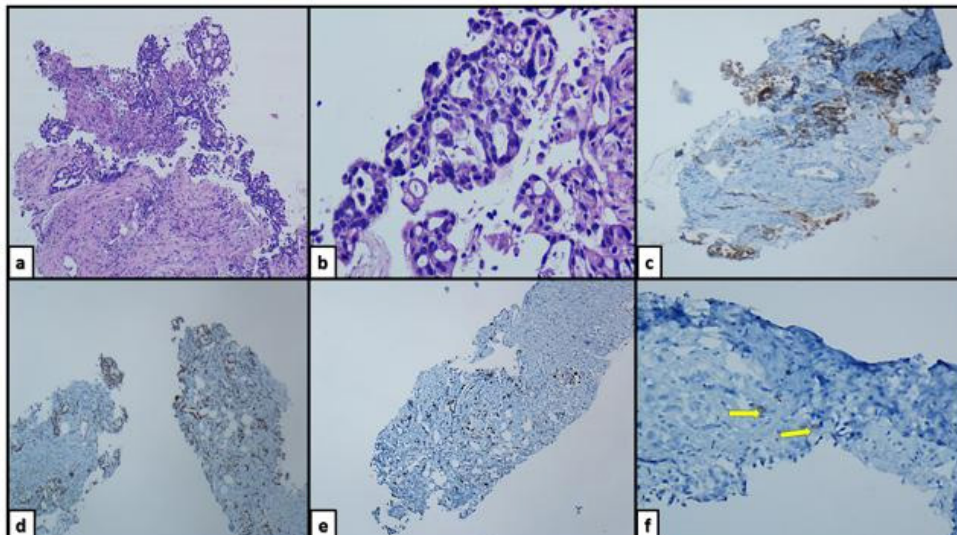


Figure 2. Histopathologic examination of a malignant epithelial tumor with cribriform architecture (a; hematoxylin & eosin x100, b; hematoxylin & eosin x400), diffuse p16 immune expression (c; immune peroxidase x100) and abnormal pattern of p53 observed in the tumor (d; immune peroxidase x200). A high proliferation index with Ki-67 (e; immune peroxidase x200) and increased mitotic activity in the tumor with PHH3 immunohistochemical staining (f; immune peroxidase x400) was noted. CK7, ESA, and CA 19.9 were positive; CDX2, SATB2, TTF1, CK20, HBME-1, calretinin, D2-40, B72.3, and ER were negative. P16 immunoreactivity was diffuse and strong. An abnormal pattern of p53 immunoreactivity (positivity in >80% cells) was observed. The current histopathological findings, together with clinical and radiological findings, were evaluated in favor of primary peritoneal serous carcinoma.

Primary peritoneal serous carcinoma (PPSC) is a rare epithelial tumor that occurs almost exclusively in women (1,2). The male: female ratio ranged from 0.0018 to 0.0045 (3). There are only a few case reports of PPSC developing in men (4). Histopathological and cytological characteristics of these tumors are similar to those of epithelial ovarian cancer (2). Therefore, in addition to histopathological examination and imaging, ovarian cancer must be ruled out during diagnosis. Imaging methods such as CT, MRI, and PET/CT are used to confirm diagnosis, differentiate between primary peritoneal cancer and peritoneal metastasis, and determine the spread of the disease (5). Although not sufficient for diagnosis, ^{18}F -FDG PET/CT can assist in distinguishing between PPSC and peritoneal karsinomatosis (6). ^{18}F -FDG PET/CT is useful in evaluating the origin of the tumor, its extent, and distant metastasis (3).

Ethics

Informed Consent: Patient consent was obtained.

Authorship Contributions

Surgical and Medical Practices: B.Ö.G., B.G., F.Ü., Concept: N.C., F.Ü., Design: B.G., Data Collection or Processing: B.Ö.G., Analysis or Interpretation: B.G., N.C., Literature Search: B.Ö.G., Writing: B.Ö.G., F.Ü.

Conflict of Interest: No conflicts of interest were declared by the authors.

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References

1. Neuhausen SL, Shani H, Boker LK, Steele L, Silverman BG, Ottini L, Silvestri V, Laitman Y, Korach J, Perri T, Friedman E. Primary Peritoneal Serous Carcinoma in Men: A Rare and Non-BRCA-associated Entity. *Anticancer Res.* 2017;37:3069-3072.
2. Levy AD, Arnáiz J, Shaw JC, Sobin LH. From the archives of the AFIP: primary peritoneal tumors: imaging features with pathologic correlation. *Radiographics.* 2008;28:583-607.
3. Guellil A, Jabi R, Mabrouk MY, Bouzayan L, Merhoum A, Del Gallo G, Godart C, Bouziane M. Primary peritoneal high-grade serous carcinoma in a man: A case report. *Ann Med Surg (Lond).* 2022;77:103605.
4. Gan J, Herzog J, Smith DA, Vos D, Kikano E, Tirumani SH, Ramaiya NH. Primary peritoneal serous carcinoma: a primer for radiologists. *Clin Imaging.* 2022;83:56-64.
5. Turlakow A, Yeung HW, Salmon AS, Macapinlac HA, Larson SM. Peritoneal carcinomatosis: role of (18)F-FDG PET. *J Nucl Med.* 2003;44:1407-1412.
6. Yun WS, Bae JM. Primary peritoneal serous carcinoma, an extremely rare malignancy: A case report and review of the literature. *Oncol Lett.* 2016;11:4063-4065.