

CASE REPORT

Isolated splenic metastasis: An uncommon manifestation of recurrent ovarian cancer

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ABSTRACT

Isolated metastasis to the splenic parenchyma from ovarian carcinoma is a rare finding and may go undetected on conventional imaging despite biochemical evidence of recurrence. We report a 58-year-old woman with rising tumor marker CA-125 and repeatedly negative anatomic imaging, in whom contrast-enhanced CT and [¹⁸F]FDG PET/CT finally identified a solitary hypermetabolic splenic lesion. A multidisciplinary review led to splenectomy, and histopathology confirmed metastatic ovarian carcinoma, followed by a marked decline in CA-125. This case highlights the diagnostic utility of [¹⁸F]FDG PET/CT in detecting isolated splenic metastases and its vital role in guiding potentially beneficial surgical management in patients with recurrent ovarian cancer.

Keywords: Genitourinary cancer; Gonadal cancer; Solitary metastasis; [¹⁸F]FDG; PET/CT

INTRODUCTION

Ovarian carcinoma is a leading cause of cancer-related mortalities among gynecological cancers. Despite optimal cytoreductive surgery and platinum-based chemotherapy, a substantial proportion of patients experience disease relapse, most commonly within the peritoneal cavity [1]. Ovarian cancers recurrence often manifests as peritoneal dissemination or nodal involvement. Distant parenchymal metastases to solid organs via hematogenous spread is uncommon. Isolated splenic metastasis from ovarian cancer is extremely rare and occurs in advanced stages of the disease [2-4]. These metastases pose diagnostic challenges as conventional imaging modalities may fail to detect small or solitary lesions. Functional imaging such as ¹⁸F-fluorodeoxyglucose positron emission tomography/computed tomography ([¹⁸F]FDG PET/CT) is a valuable tool for identifying occult metastases in patients with rising tumor markers and negative cross-sectional imaging and

for guiding therapeutic decisions [5]. We present a case of a 58-year-old woman with a history of ovarian carcinoma who developed an isolated splenic metastasis nine years after initial diagnosis. Despite inconclusive conventional imaging, [^{18}F]FDG PET/CT showed intense hypermetabolism in splenic metastasis leading to surgical intervention. This report highlights the diagnostic value of [^{18}F]FDG PET/CT in detecting isolated metastases and improving patients' management in ovarian cancer.

CASE PRESENTATION

A 58-year-old woman with a history of ovarian carcinoma, initially diagnosed nine years previously, underwent optimal cytoreductive surgery consisting of total abdominal hysterectomy and bilateral salpingo-oophorectomy, followed by adjuvant chemotherapy with paclitaxel–carboplatin. During surveillance, her serum CA-125 levels began to rise approximately two years after treatment completion; however, according to her referring physician, cross-sectional imaging at that time revealed no radiologic evidence of recurrence. Over the subsequent years, she received multiple lines of systemic therapy—including additional platinum–taxane–based regimens and later liposomal doxorubicin—in response to episodes of biochemical elevation, despite persistently negative conventional imaging. Detailed records of the patient's previous surveillance, including serial serum CA-125 measurements and imaging studies, were not available for review because follow-up had been performed at outside institutions. Based on the clinical information that was provided by the referring physician, nine years after her initial diagnosis, she experienced another significant elevation in CA-125. To more accurately localize potential sites of recurrence, she underwent a contrast-enhanced abdominopelvic CT scan. The contrast-enhanced CT demonstrated a well-defined lobulated hypodense splenic mass measuring 3.5 cm in greatest diameter, with heterogeneous post-contrast enhancement. Given the indeterminate appearance of the lesion on contrast-enhanced CT, [^{18}F]FDG PET/CT was subsequently performed for further lesion characterization and whole-body evaluation. [^{18}F]FDG PET/CT (Figure 1A) revealed a hypodense lobulated splenic lesion with homogeneously increased metabolic activity ($\text{SUV}_{\text{max}}=13.84$, liver $\text{SUV}_{\text{mean}}=2.27$) (Figure 1B, red arrows). At the time of the [^{18}F]FDG PET/CT examination, the patient had not received any recent chemotherapy, minimizing the likelihood of treatment-related inflammatory FDG uptake. Instead, findings significantly increased the suspicion for malignant involvement, while no additional metabolically active tumor foci were identified elsewhere in the body (Figure 1A). Based on the concordant CT and PET findings, the case was reviewed at a multidisciplinary tumor board, which recommended definitive surgical management. She underwent splenectomy, during which careful intraoperative inspection of the peritoneal surfaces revealed no evidence of carcinomatosis. Histopathologic analysis of the splenic specimen confirmed metastatic papillary carcinoma. Immunohistochemistry further substantiated the diagnosis, demonstrating features consistent with recurrent ovarian carcinoma. Following splenectomy, the patient's serum CA-125 levels declined markedly, indicating biochemical response and effective disease control.

DISCUSSION

Isolated metastasis to the splenic parenchyma from ovarian carcinoma is an uncommon occurrence and typically represents late-stage hematogenous dissemination rather than the more common pattern of peritoneal seeding and capsular involvement [2-4]. In the present case, contrast-enhanced CT scan showed a well-defined lobulated hypodense splenic mass with heterogeneous post-contrast enhancement. Based on these imaging findings, the radiologic differential diagnoses

included metastatic disease as well as primary splenic neoplasms, such as an inflammatory myofibroblastic tumor or sclerosing angiomatoid nodular transformation (SANT). Given the indeterminate nature of the lesion on contrast-enhanced CT, [^{18}F]FDG PET/CT was subsequently performed for further characterization, ultimately demonstrating increased metabolic activity within the splenic lesion without evidence of additional site of disease. Splenic parenchymal metastases have traditionally been attributed to late hematogenous dissemination; however, ovarian carcinoma more commonly spreads through peritoneal implantation, so the exact route of metastatic spread cannot be determined. Given the patient's history of several episodes of raising tumor markers and prolonged clinical course, both hematogenous dissemination and progression from an occult splenic capsular/peritoneal implant with subsequent endophytic extension into the splenic parenchyma are plausible explanations. Since no prior imaging study has documented the evolution of the lesion, either mechanism remains speculative. The repeated negative findings on conventional imaging despite progressively rising serum CA-125 levels likely reflect the occult nature of recurrent ovarian carcinoma. Furthermore, the small size of the lesion during earlier stages of recurrence may have limited their detectability by conventional imaging methods. Functional imaging with [^{18}F]FDG PET/CT nevertheless played a valuable role for detecting isolated metabolically active splenic lesion leading to definitive surgical management. This functional diagnostic tool has the potential to detect isolated splenic metastases from diverse primary origins e.g. lung [6], hepatocellular [7], colorectal [8], renal [9] and endometrial cancer [10, 11]; However, the possibility of false-positive findings such as hamartoma [12], SANT [13] or a hyalinized nodule [14] should be taken into account. In patients with ovarian carcinoma who develop rising serum CA-125 levels despite negative or inconclusive conventional imaging, [^{18}F]FDG PET/CT can provide important diagnostic information by localizing sites of recurrent disease [4, 15]. Identification of an isolated metabolically active lesion not only establishes the extent of disease but may also identify patients who are candidates for potentially curative surgical resection. In selected patients with isolated splenic metastasis, splenectomy has been associated with favorable clinical outcomes and prolonged survival, supporting an aggressive surgical approach when complete resection is feasible [16-18]. Our case illustrates how the complementary use of contrast-enhanced CT and [^{18}F]FDG PET/CT facilitated the diagnosis of an isolated splenic metastasis and directly influenced multidisciplinary decision-making and patient management.

CONCLUSION

This case highlights the importance of considering splenic metastasis in the differential diagnosis of hypermetabolic splenic lesions, particularly in patients with a history of malignancy and rising tumor markers despite negative or inconclusive conventional imaging. [^{18}F]FDG PET/CT provides valuable complementary metabolic information, enabling detection of occult metastatic lesions, assessment of disease extent, and identification of patients with isolated, potentially respectable disease. In selected cases, accurate localization of solitary splenic metastasis by PET/CT may facilitate multidisciplinary decision-making and guide surgical management, potentially improving clinical outcomes.

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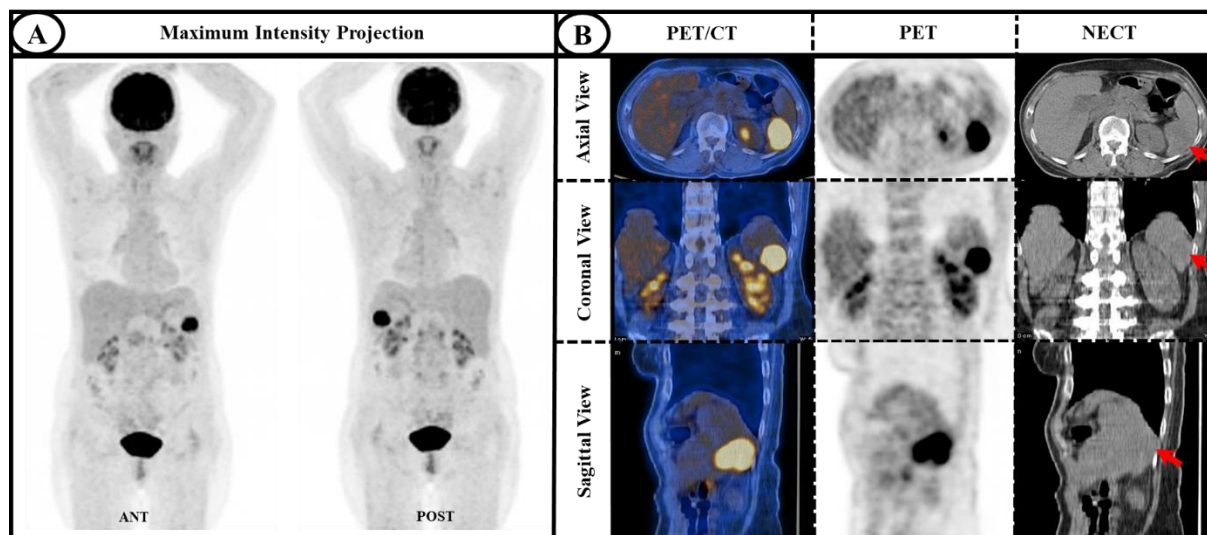


Figure 1. $[^{18}\text{F}]$ FDG PET/CT MIP images. (A) demonstrate a solitary focus of intense homogeneous $[^{18}\text{F}]$ FDG uptake in the left upper abdomen, with no additional hypermetabolic lesions elsewhere. Fused PET/CT images. (B) show a well-defined lobulated hypodense splenic mass with intense FDG uptake (SUVmax=13.84, liver SUVmean=2.27), (B, red arrows), consistent with an isolated splenic metastasis subsequently confirmed by histopathology