Disseminated thoracoabdominal splenosis mimicking metastatic disease: A case of colorectal cancer

Case Report

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ABSTRACT

Here, we describe a patient with a history of colorectal cancer in whom 2-[^{18}F]fluoro-2-deoxy-D-glucose positron emission tomography/computed tomography ([^{18}F]FDG PET/CT) was performed for the evaluation of response to therapy. [^{18}F]FDG PET/CT showed a small residual disease in the rectum. In addition, multiple metabolically inactive soft tissue densities were demonstrated in the left hemithorax and the left upper abdominal region, previously interpreted as metastases on computed tomography. Furthermore, bizarre-shaped soft tissues were visualized in the anatomical location of the spleen. Hence, splenosis was suspected. Subsequently, the patient underwent [^{99m}Tc]Tc-denatured red blood cell ([^{99m}Tc]Tc-DRBC) scintigraphy, which confirmed the diagnosis of extensive thoracoabdominal splenosis.

Key words: Splenosis; [^{18}F]FDG PET/CT; Denatured red blood cell; Technetium-99m; Scintigraphy; Colorectal cancer

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INTRODUCTION

Splenosis, first reported by Buchbinder and Lipkoff in 1939, is defined as the heterotrophic implantation of splenic tissue on ectopic sites, usually in patients undergone splenectomy or traumatic rupture of the spleen [1], resulting in nodules in the thorax, abdomen, or pelvic cavity [2]. It occurs in 56% to 75% of patients with traumatic or surgical rupture of the spleen with an average time interval of 25 years to diagnosis [1].

Splenosis is mostly asymptomatic and incidentally discovered during radiological examination for other reasons [3]. Also, it can be misinterpreted as other entities without timely clinical suspicion.

Here, we describe a colorectal cancer patient with apparently multiple metastases in the abdomen and left hemithorax, which proved to be as a result of splenosis.

CASE PRESENTATION

A 71-year-old man with a history of rectal cancer (T3NxM1) was referred to the nuclear medicine department in November 2020 to assess the response to chemoradiation therapy.

The patient was diagnosed with rectal adenocarcinoma six months before. According to the chest computed tomography (CT) scan at the time of the diagnosis, the patient had been diagnosed with multiple pulmonary metastases in the left lung, measuring up to 33 × 33 mm. Besides, the wall thickening of the left lateral wall of the rectum had been observed in the pre-treatment abdominopelvic CT scan, corresponding to the primary biopsy-proven tumoral lesion. The physical examination was unremarkable. The carcinoembryonic antigen (CEA) level was within normal limits. The patient underwent chemo-radiotherapy.

Subsequently, for evaluation of response to therapy, an 2-[^{18}F]fluoro-2-deoxy-D-glucosepositron emission tomography/CT ([^{18}F]FDG PET/CT) was performed after conclusion of his treatment course. The study showed a small focus of [^{18}F]FDG uptake in the pelvic region, compatible with the minimal residual disease in the rectum (Figure 1a and 1b, yellow arrow). Otherwise, there were several metabolically inactive soft tissue densities and multiple pleural nodules in the left hemithorax, measuring up to 34 mm, on fused trans-axial images (Figure 1c-f, blue arrows). Importantly, the spleen was not visualized. Also, multiple bizarre-shaped soft tissues, with similar density to the thoracic lesions, were depicted in the left sub-diaphragmatic region and lateral aspect of the left upper abdominal cavity (Figure 1f and 1g], green arrows). These findings shed light on a hypothesis that the left hemithorax lesions might be post-trauma splenosis. After a more focused interview, he finally acknowledged that he had an accident in his childhood.

A technetium-99m-denatured red blood cell scintigraphy ([^{99m}Tc]Tc-DRBC) was performed (Figure 2). The images demonstrated significant uptake in the previously delineated lesions on both planar and hybrid single photon emission computed tomography/CT (SPECT/CT) views (Figure 2a-j). Additional smaller splenic tissues were detected in the abdominal cavity (Figure 2j, red arrow) and left pleura (Figure 2g], red arrowhead).

The technique for image acquisition is provided in Supplementary 1.

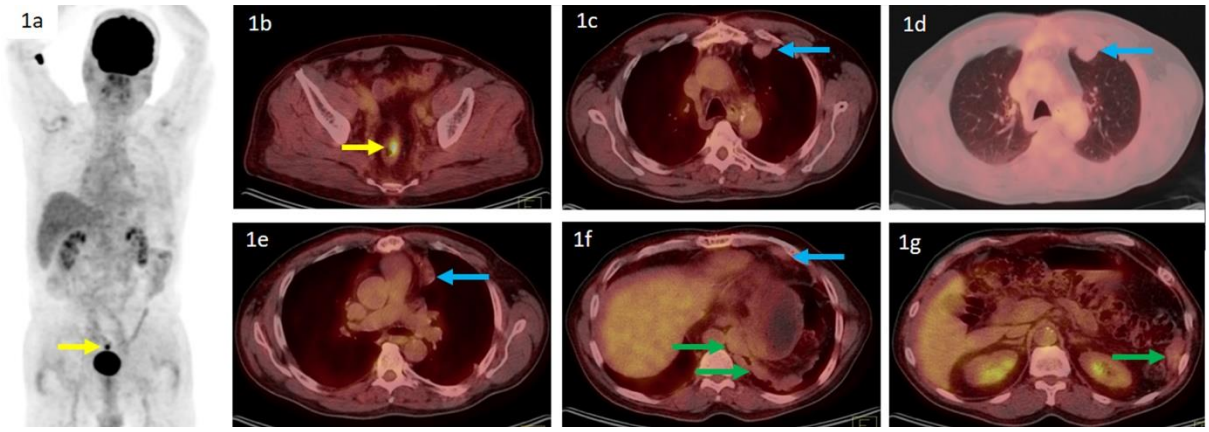

Fig 1. A 71-year-old male with a history of rectal cancer and pulmonary metastases underwent 2- fluorodeoxyglucose positron emission tomography/computed tomography ([^{18}F]FDG PET/CT) to evaluate response to chemoradiotherapy. The maximum projection intensity (MIP, 1a) and fused transaxial (1b) images show a small focus of [^{18}F]FDG uptake in the pelvic region (yellow arrow), suggesting small residual disease. There are several metabolically inactive soft tissue densities in the left hemithorax on fused trans-axial images (1c-f, blue arrows), representing splenic tissues. Bizarre-shaped soft tissues (1f and 1g, green arrows) are seen in the anatomical location of the spleen, which are splenic tissues.

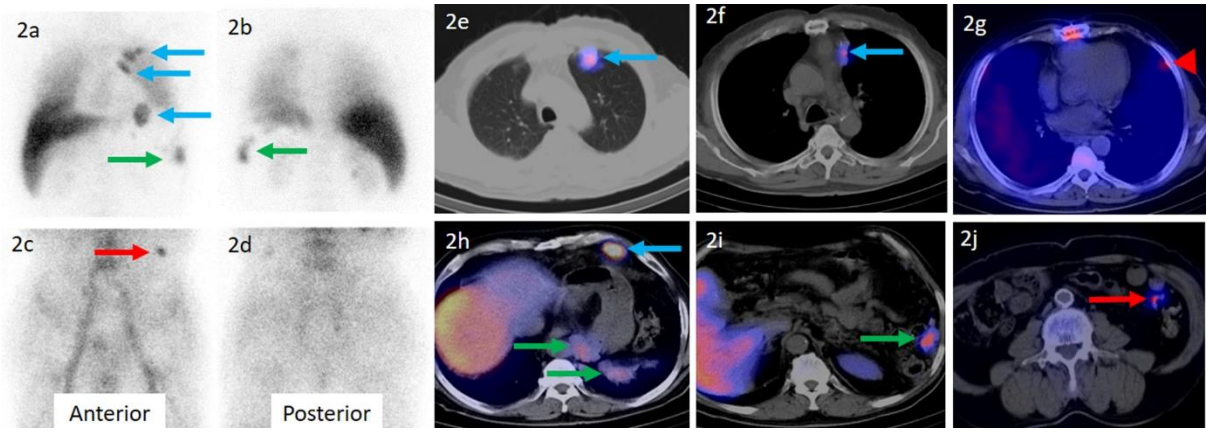

Fig 2. A 71-year-old male with a history of rectal cancer and pulmonary metastases underwent technetium-99m-denatured red blood cell ([^{99m}Tc]Tc-DRBC) scintigraphy to confirm the presence of splenic tissue. Planar thoracic (anterior: 2a, posterior: 2b) and abdominal (anterior: 2c, posterior: 2d) images, as well as fused hybrid single-photon emission computed tomography/computed tomography (SPECT/CT) views, show multiple foci of increased uptake in the thoracic (blue arrows) and abdominal (green arrows) regions, which are compatible with lesions demonstrated in [^{18}F]FDG PET/CT. Additional foci of uptake are demonstrated in the left pleura (red arrowhead) and left upper abdominal quadrant, attached to the bowels (red arrow)

DISCUSSION

The present case is a 71-year-old male in whom conventional nuclear scintigraphy confirmed the diagnosis of disseminated thoracoabdominal splenosis. Although, the average time interval for diagnosis is reported to be about 25 years [1]; it took more than 50 years to diagnose splenosis in our patient.

However, splenosis is mostly asymptomatic and incidentally discovered [3], rare cases of bowel obstruction due to adhesive bands [4], infertility due to a large pelvic mass with associated pressure effect on the male gonads [5], appendicitis [6], and hemoptysis [7] have been reported.

They are usually detected in the abdomen, mainly attached to the small intestine, large omentum, mesentery, and parietal peritoneum [8]. Thoracic splenosis is rare, commonly occurs after a splenodiaphragmatic injury [3].

Radiological investigations (ultrasound and CT) are not specific enough for the diagnosis of splenosis. The [^{18}F]FDG PET/CT has no role in the evaluation of splenosis. [^{99m}Tc]Tc-DRBC could confirm the diagnosis [9]. Additionally, SPECT/CT technique makes it possible to precisely detect and locate smaller lesions [3].

In cases newly diagnosed for malignancy, it is of particular importance to distinguish these lesions from tumoral involvement to avoid mismanagement. It requires a clinical suspicion in patients with a history of splenic rupture or splenectomy, particularly in cases with malignancy. Splenosis can be misdiagnosed as other entities based on the location of the implants, including lymphoma [10], GIST [11], liver tumor [12] or as in our patient, lung and abdominal lymph nodes metastases. With correct diagnosis, the patient was scheduled for watchful follow up and an unnecessary treatment was avoided.

CONCLUSION

Thoracic splenosis is rare. It can be confirmed with [^{99m}Tc]Tc-DRBC scintigraphy. It is crucial to have a clinical suspicion in patients with a history of splenic rupture or splenectomy, especially in cancer patients, to avoid mismanagement. Moreover, this case reminds the significant role of conventional nuclear medicine ([^{99m}Tc]Tc-DRBC scan) in the management of patients with cancer.

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