Corticomedullary Mixed Tumor of the Adrenal Gland with Apparent ^{18}F-Fluorodeoxyglucose Activity But No ^{68}GA-DOTATATE Uptake on Positron Emission Tomography/Computed Tomography

Abstract

Corticomedullary mixed tumor (CMT) is a single adrenal tumor mass composed histologically by an admixture of adrenal cortical and medullary cells. It is a rare condition, with approximately 20 cases reported to date. To our knowledge, the positron emission tomography (PET) imaging findings of this mostly benign tumor have not been reported in the literature. We present a case of CMT who was evaluated with both ^{18}F-fluorodeoxyglucose (^{18}F-FDG) and ^{68}Ga-DOTATATE. The hypermetabolic tumor seen on ^{18}F-FDG PET/computed tomography scan showed no abnormal uptake by ^{68}Ga-DOTATATE.

Keywords: *^{18}F-fluorodeoxyglucose positron emission tomography/computed tomography, ^{68}Ga-DOTATATE positron emission tomography/computed tomography, adrenal gland, corticomedullary mixed tumor*

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A 63-year-old woman who was complaining of abdominal pain in her left flank was referred to the endocrinology clinic after an adrenal adenoma was incidentally detected in her left adrenal gland on computed tomography (CT) examination of the abdomen. In physical examination, her body mass ındex was 23.6 kg/m^2; she did not have a facial plethora, moon face, central obesity, purple striae, and/or supraclavicular fat pads. She did not have diabetes mellitus or hypertension. In the laboratory examination, the 1-mg overnight dexamethasone suppression test (DST) was 5.32 µg/dL (normal value: <1.8 µg/dL) and 2-day low-dose DST was 3.26 µg/dL (normal value: <1.8 µg/dL). The other laboratory parameters such as renin plasma activity, urine free cortisol, the plasma ACTH, serum potassium, aldosterone, DHEA-S, and urinary fractionated metanephrine levels were normal. Pituitary MRI reported empty sella. Anterior pituitary hormones were detected at reference ranges. Bone densitometry findings were also normal. There was no obvious cushingoid features, and the patient was diagnosed as subclinical Cushing's syndrome. The patient was evaluated with both ^{18}F-fluorodeoxyglucose (^{18}F-FDG) and ^{68}Ga-DOTATATE. On ^{18}F-FDG positron emission tomography/CT (PET/CT), there was a hypermetabolic mass lesion on the medial crus of the left adrenal gland, suggesting a malignancy (maximum standardized uptake value [SUV] was 4.4, clearly higher than the background liver SUV values [Figure 1a]). This lesion showed no abnormal uptake on ^{68}Ga-DOTATATE PET/CT [Figure 1b]. Laparoscopic left adrenalectomy was performed. Grossly, the tumor was well defined, encapsulated, solid, orange colored with heterogeneous bleeding areas and focally rimmed with normal adrenal tissue. The tumor diameter was 2.4 cm × 2.3 cm × 2 cm and histopathologically demonstrated two different cell types composed of cortical and chromaffin cells. No any nuclear atypic characteristics, capsular invasion, microvascular invasion, and necrosis were seen in the pathology specimen. Proliferation index was 2.15%. The Weiss score was 1, compatible with a definitive pathologic diagnosis of a benign corticomedullary mixed tumor (CMT).[1] The patient was followed up at the endocrine outpatient clinic, and 1-mg overnight DST was 0.26 µg/dL at postoperative 3rd month. CMT is a single adrenal tumor mass composed histologically

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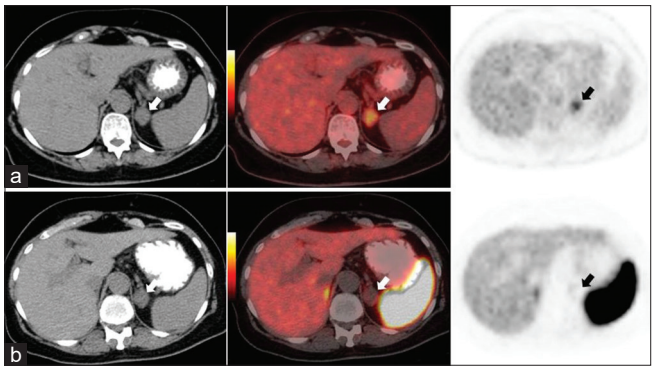

Figure 1: (a) Hypermetabolic mass lesion on the medial crus of the left adrenal gland. (b) This hypermetabolic lesion showed no uptake on ^{68}Ga-DOTATATE PET/CT

by an admixture of adrenal cortical and medullary cells. These tumors are likely to occur in females and produce both cortisol and catecholamine. In the vast majority of patients, the symptoms were related to the tumor's hormone hypersecretion.[2,3] Most of them are benign with a favorable prognosis, but some malignant tumors with a poor prognosis have been reported.[4,5] Due to the lack of specific clinical features, these tumors are discovered accidentally on histological examination. ^{18}F-FDG PET/CT is a useful imaging technique in characterizing adrenal masses. However false-positive interpretations may result from benign lesions.[6,7] Currently, several DOTA peptides have been labeled with ^{68}Ga and introduced with high specificity and sensitivity to detect neuroendocrine tumors that overexpress somatostatin receptors.[8,9] Our case is the first one to our knowledge to report a case of a benign CMT who was evaluated with PET imaging findings, and it should be kept in mind that it may exhibit false-positive results for malignancy with ^{18}F-FDG PET/CT. It has been reported that ^{68}Ga-DOTATATE uptake was significantly higher in malignant lesions than benign lesions.[10] Negative ^{68}Ga-DOTATATE PET/CT findings may be a clue for benignity in this patient group. It may be important to obtain further PET imaging results, especially in patients with pathologic diagnosis of malign CMT.

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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