

# Primary ovarian carcinoid and dotanoc positron emission tomography-computed tomography scan

### ABSTRACT

Primary ovarian carcinoids are very rare tumors, representing only <1% of all carcinoid tumors and <0.1% of all ovarian neoplasm. Here, we present a case report where DOTANOC positron emission tomography-computed tomography scan helped in diagnosis and management of rare entity.

**Keywords:** DOTANOC positron emission tomography-computed tomography scan, FDG positron emission tomography, ovarian carcinoid

### INTRODUCTION

Ovarian tumors are divided into five histological subtypes: insular, trabecular, stromal, mucinous and mixed, of which ovarian carcinoids are very rare representing < 0.1% of all ovarian neoplasms.<sup>[1,2]</sup> Of all these varieties, insular type is the most common type and stromal variety is the least common. Primary carcinoid tumors are associated with symptoms of carcinoid syndrome. Here, we report the case of a postmenopausal female who presented with a history of abdominal discomfort and diagnosed with primary carcinoid of ovary and DOTANOC positron emission tomography-computed tomography scan (PET-CT) scan helping in the final diagnosis.

### CASE REPORT

A postmenopausal, diabetic, and hypertensive female presented with a history of abdominal pain from the last 2 months, CT scan whole abdomen was suggestive of the right adnexal mass, and CA-125 was 277.9 U/ml. Thus, raising suspicion of carcinoma ovary and fludeoxyglucose (FDG) PET-CT scan was advised. FDG PET-CT scan showed faint FDG uptake in the right adnexa [Figure 1a]. On further investigation, her ECHO showed severe tricuspid regurgitation and raising suspicion of carcinoid syndrome, and subsequently, the

patient was referred for DOTANOC PET-CT scan. This scan showed DOTA-avid solid cystic lesions in the right adnexal region [Figure 1b] and other DOTA-avid lesions in the left femur. CT-guided biopsy from this right adnexa lesion was done and histopathological report confirmed diagnosis of primary ovarian carcinoid. Microscopic examination indicated tissue cores with infiltration by nests and sheets of monomorphic cells with well-defined eosinophilic cytoplasm [Figure 2a]; immunohistochemistry (IHC) report showed strong immunoreactivity to chromogranin [Figure 2b] and synaptophysin [Figure 2c]. Thus, diagnosis of metastatic carcinoid syndrome was confirmed and the patient was started on injection Sandostatin.


### DISCUSSION

We report this case due to low incidence of this tumor, thus making its diagnosis less likely. They more commonly affect postmenopausal women with median age of presentation of

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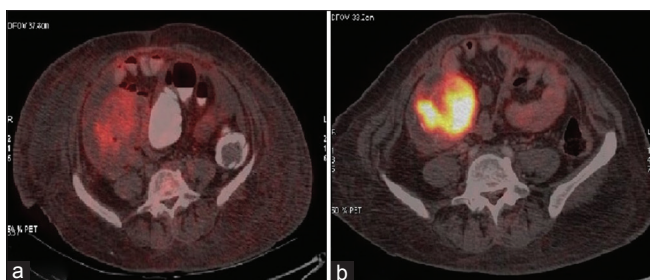
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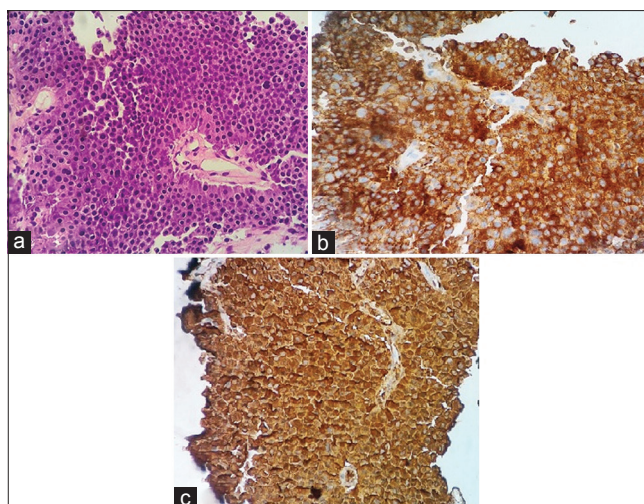


**Figure 1:** (a) Fludeoxyglucose positron emission tomography-computed tomography scan image with faint uptake in the right adnexa. (b) DOTANOC positron emission tomography-computed tomography scan image with uptake in the right adnexa

55 years.<sup>[3]</sup> The primary ovarian carcinoids are usually unilateral disease and bilateral involvement is very rare or is suggestive of spread within the peritoneal cavity, more commonly seen in carcinoid of the gastrointestinal tract.<sup>[4]</sup> In the present case report, low-grade FDG uptake in primary lesion and finding of tricuspid regurgitation on ECHO raised suspicion of this rare entity and DOTANOC PET-CT scan helped in final diagnosis, thus highlighting the importance of this scan.

First description of ovarian carcinoid tumors was given in 1939 by Stewart *et al.*<sup>[5]</sup> Since then, few case reports have been published about the same.<sup>[6]</sup> Carcinoid tumors secrete various substances such as serotonin, histamine, and prostaglandins.<sup>[7]</sup> Excess of these substances can lead to flushing and diarrhea-like symptoms. Usually, these substances are detoxified by liver in intestinal carcinoid but functioning primary ovarian carcinoid tumors can cause these symptoms directly, as their venous drainage bypasses the portal venous system,<sup>[8]</sup> other symptoms can be of carcinoid of heart-like tricuspid insufficiency and pulmonary stenosis, which were seen in our patient. Synaptophysin and chromogranin are the markers in IHC for the diagnosis of carcinoid tumors.

Ga-68 DOTA peptides have high affinity for somatostatin receptor (SSTR). Since majority of carcinoids express SSTR, DOTA peptides can be used to visualize these tumors *in vivo*. Thus, in case of carcinoid symptoms or high clinical suspicion, DOTA PET-CT scan can be helpful in diagnosis of these rare tumors. As in the present case, DOTA PET scan helped in diagnosis and management of this rare disease by demonstrating DOTA-avid primary lesion and by highlighting metastatic site. Therefore, in case of high clinical suspicion, DOTA scan can be done in guiding clinician for accurate diagnosis.



**Figure 2:** (a) Microscopic examination of ovarian carcinoid image. (b) Strong immunoreactivity to chromogranin. (c) Strong immunoreactivity to synaptophysin

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#### Conflicts of interest

There are no conflicts of interest.

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