Case Report

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Concurrent Endometrial Carcinosarcoma and Thyroid Papillary Carcinoma: PET CT Imaging Findings

Eş Zamanlı Endometrial Karsinosarkom ve Tiroid Papiller Kanser: PET BT Görüntüleme Bulguları

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Abstract

The aim of this study is to report a patient who was diagnosed with a concurrent primary tumor by 18-fluoro-2-deoxy-glucose positron emission tomography (FDG PET) imaging performed for staging of an endometrial cancer. FDG uptake was detected in the uterus, where the primary cancer was located, and in the left lobe of the thyroid gland. The biopsy sample from the hypermetabolic nodular lesion in thyroid gland revealed intermediate cytology according to Bethesda Classification. The patient underwent hysterectomy and thyroidectomy. An endometrial carcinoma in the uterus and a multicentric thyroid papillary carcinoma in the thyroid gland were diagnosed.

Key Words: Carcinoma of endometrium, positron-emission tomography, thyroid cancer

Conflicts of Interest: The authors reported no conflict of interest related to this article.

Özet

Bu çalışmanın amacı endometrial kanserin evrelemesi için uygulanan ^{18}F FDG PET ile tanısı konulan ikinci primer tümörü olan hastayı sunmaktır. FDG tutulumu primer kanser olduğu bilinen uterusta ve tiroid glandının sol lobunda saptandı. Tiroid bezinde rastlanılan hipermetabolik nodüler lezyondan yapılan biyopsi sonucu Bethesda Sınıflamasına göre intermediate sitoloji gelmiştir. Hastaya uygulanan histerektomi ve tiroidektomi sonrası uterusta endometriyum karsinosarkomu, tiroid bezinde multisantrik tiroid papiller karsinomu tespit edilmiştir.

Anahtar Kelimeler: Endometriyum karsinomu, pozitron emisyon tomografisi, tiroid kanser

Çıkar Çatışması: Yazarlar bu makale ile ilgili olarak herhangi bir çıkar çatışması bildirmemiştir.

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Introduction

Positron emission tomography (PET) combined with computerized tomography (CT) is commonly used for staging and follow-up of many cancer types in oncology practice (1). Although the role of PET/CT has not been well-documented in gynecological cancers except for cervical and ovarian cancers, it is capable of altering treatment decisions in many cases by detecting distant metastases (2,3). Performed to detect distant metastases, this modality also allows detection of another concurrent malignancy. Morbidity and mortality rates tend to decrease with treatment of incidentally found concurrent malignancies.

Case Report

A 54-year-old woman with 1 previous pregnancy and 1 delivery, who was in menopause for 2 years was admitted to our gynecology and obstetrics clinic for vaginal bleeding. In physical examination the uterus was of normal size and cervix had a multiparous appearance. Pelvic ultrasonography revealed a uterine size of 7x9 cm and an endometrial cavity thickness of 34 mm. Abdominal magnetic resonance imaging showed a solid mass lesion 27x32x44 mm in size in the endometrial cavity, which invaded the myometrium and filled the endometrial cavity (Figure 1a). The endometrial tumor was considered as stage 1B radiologically, since it showed myometrial invasion in excess of 50%. A diagnostic endometrial curettage was performed. The histopathologic examination revealed endometrial carcinosarcoma. Whole body PET/CT scan performed for preoperative staging of endometrial cancer demonstrated a diffusely increased pathological uptake of the radiopharmaceutical agent, a finding that was consistent with the primary malignancy (Figure 1b, 1c). In addition to this finding, a hypermetabolic nodular lesion with a high SUV level that was 1.3 cm in size was detected in the left lobe of the thyroid gland (Figure 2a, 2b, 2c). A diagnostic fine needle aspiration biopsy of the thyroid gland was consistent with an intermediate cytology according to Bethesda Classification. With these findings, the patient underwent total abdominal hysterectomy, bilateral salphingo-oopherectomy, pelvic-paraaortic lymph node dissection, omentectomy, and total thyroidectomy at the same session.

Postoperative histopathological examination of the uterus revealed an endometrial carcinosarcoma (Figure 3a, 3b), while histopathological examination of the thyroid gland was consistent with a multicentric thyroid papillary carcinoma (follicular variant) in the left lobe of the thyroid gland (Figure 4a, 4b). The endometrial cancer was surgically staged as stage 1B. The patient subsequently underwent external radiotherapy (ERT) to the pelvic region, and radioactive iodine-131 (I-131) therapy for thyroid cancer. No recurrences or metastases were detected at the follow-up appointment 1 year later.

Discussion

The exact cause of multiple primary cancers is unknown, although family history, genetic and immunological factors, and exposure to some carcinogens have been implicated. The incidence of primary cancers varies by organ systems involved, and varies between 1.7 and 5.17% for the female genital tract (4).

Concurrence of endometrial cancers and ovarian cancers is already known. However, extra-genital tumors accompanying endometrial cancer are extremely uncommon. To the best of our knowledge, this case is the first report of an endometrial carcinosarcoma and a thyroid cancer concurrently. However, Eren et al. reported a case with concurrent endometrial adenocarcinoma, thyroid cancer, and lung cancer detected by PET/CT imaging findings (5).

Endometrial carcinosarcoma is a rare malignancy with poor prognosis. PET/CT has a limited use for staging of endometrial cancer in clinical practice. Radiological staging is made by magnetic resonance imaging (MRI). FIGO (The International Federation of Gynecology and Obstetrics) surgical staging system is used for diagnostic and therapeutic purposes. A PET/CT examination is usually ordered for patients with widespread and high-grade endometrial cancer. There are a very limited number of case reports in the literature reporting PET/CT findings of uterine carcinosarcoma.

PET is characterized by low spatial resolution and performs poorly in detecting small lesions, therefore, it has no role as a screening tool for early detection of cancer. PET/CT may show a very low malignant FDG uptake in the uterus, and can distinguish benign and malignant tissues from each other. However, its sensitivity is lower than that of MRI (6). MRI, CT, and ultrasonography are more appropriate as initial diagnostic modalities owing to their higher spatial resolution, while PET has a limited role in evaluation of the primary tumor.

According to FIGO 1988 staging system, all lymph node metastases are assigned as stage 3c, while FIGO Gynecologic Cancer Staging system revised in October 2009 accepted pelvic lymph node metastasis as stage 3c1, and paraaortic

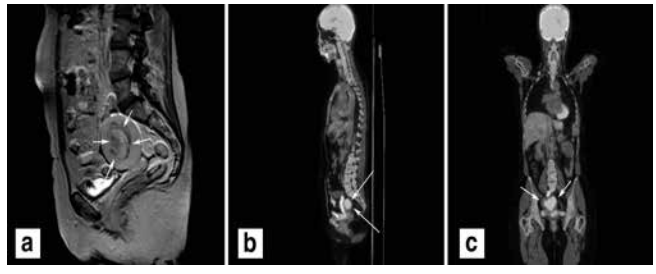

Figure 1. T1W sagittal MR image showing the lesion that fills the endometrial cavity and invades the myometrium (arrows) (a). Coronal (b) sagittal (c) PET/CT images showing hypermetabolic mass lesions in the endometrium SUVmax: 19.2

lymph node metastasis as stage 3c2. Thus, identifying the location of metastatic lymph nodes has become even more significant. As diagnosing metastatic lymph nodes based on size is challenging, PET/CT is accepted as an important tool for pre-treatment staging (2). PET/CT has a better sensitivity and specificity than MRI for detecting pelvic and paraaortic lymph node metastases (7). However, it is not that effective in detecting lymph nodes equal to or smaller than 5 mm (8). Therefore, PET cannot detect micro-metastases. MR is superior to PET/CT with respect to showing myometrial invasion in stage 1 endometrial cancers. Nevertheless, surgical staging is superior to both PET/CT and MRI in detecting small pelvic and paraaortic lymph node metastases that are indiscernible by PET/CT or MRI (2).

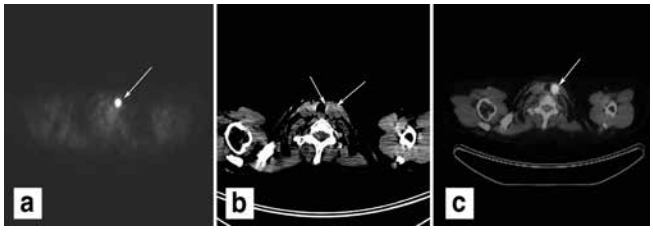

Figure 2. Pathologic ^{18}F-FDG uptake was demonstrated in the neck (a). The CT (b) and the fusion image (c) confirmed the activity in thyroid left lobe. The ^{18}F-FDG uptake on the left lobe (arrows) with a maximum SUV value of 14.8

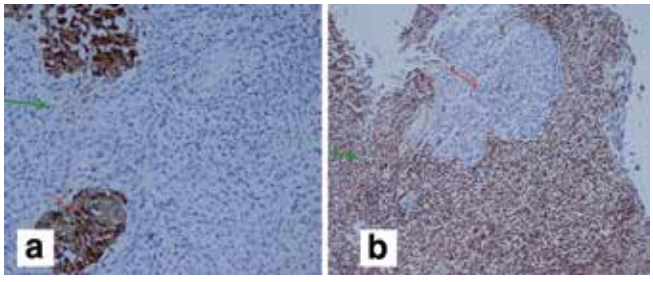

Figure 3. Histopathological examination of the endometrial tumor: Immunohistochemically, epithelial areas were positive (red arrow) and areas of sarcoma were negative (green arrow) for pancytokeratin (Pancytokeratin x20) (a). Areas of sarcoma were positive (green arrow) and areas of carcinoma were negative (red arrow) for vimentin (Vimentin x20) (b)

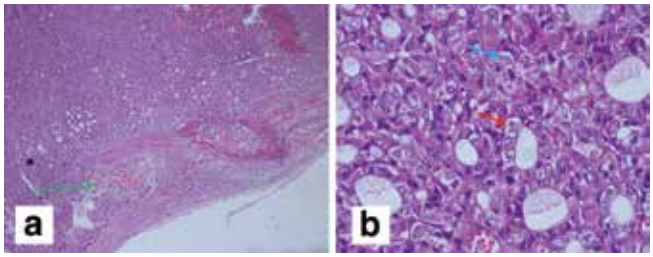

Figure 4. Histopathological examination of the thyroid gland: Areas of tumor composed of small follicular structures minimally invading the capsule (H&E, x10) (a) in a greater magnification, areas having the nuclear characteristics (red arrow) of a papillary carcinoma including nuclear ducting (blue arrow), cytoplasmic clearing, and cytoplasmic membrane thickening (H&E, x40) (b)

FDG PET has recently been performed for a growing number of oncological and non-oncological indications. This modality increased the number of thyroid incidentalomas. The rate of thyroid nodules ranges from 50% to 60% in general population. The rate of thyroid incidentalomas detected by PET/CT, on the other hand, ranges between 1.2% to 4.3% (9,10,11,12). A review has reported that a malignancy is detected in 13.6% to 46.7% of FDG-positive thyroid nodules (13). Thyroid incidentalomas showing focal FDG uptake are characterized by a risk of malignancy as high as 14% to 68.8%. In contrast, nodules with diffuse FDG uptake have a risk of 5% (10). Malignant thyroid nodules exhibit a higher FDG uptake (as indicated by a high SUVmax) as compared to benign ones. However, there is a considerable overlap between the SUVmax values of malignant and benign lesions, and there is no clear cut-off values for SUVmax to differentiate benign lesions from malignant ones (10).

Despite the fact that malignant lesions have a higher SUV value as compared to benign lesions, using FDG-PET and SUV is not appropriate for characterization of thyroid nodules and differentiation of benign lesions from malignant lesions (10). Conditions such as chronic thyroiditis, Graves' disease, and Hashimoto's thyroiditis may also show FDG uptake. All patients with focal, multifocal, or diffuse FDG uptake should undergo further tests including high-resolution USG and/or USG-guided fine needle biopsy irrespective of the SUV level (10).

In conclusion, PET/CT performed in our patient for staging of endometrial carcinosarcoma detected a concurrent thyroid cancer. Cases with FDG uptake in thyroid tissue should be further evaluated with USG and/or USG-guided fine needle biopsy to rule out malignancy.

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