



## A Rare Case of Small Cell Lung Carcinoma Diagnosed with a Breast Mass

Memede Kitle ile Tanı Konulan Nadir Bir Küçük Hücreli Akciğer Karsinomu Olgusu

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### Abstract

A 63-year-old woman presented to the emergency department with dyspnea, chest pain, and a palpable right breast mass. Non-contrast thoracic computed tomography (CT) scan revealed suspicious lesions in the right upper lung lobe and right breast, as well as right pleural effusion. For further evaluation, <sup>18</sup>F-fluorodeoxyglucose (FDG) positron emission tomography (PET)/CT scan was performed. There was increased FDG uptake in the right breast, right lung, liver, bones, and lymph nodes. Histopathological assessment confirmed that the breast mass was a metastatic lesion originating from a primary small-cell lung carcinoma. The manifestation of primary lung carcinoma with a metastatic mass lesion in the breast region is a rare condition. The manifestation can lead to diagnostic challenges, particularly when distinguishing it from a primary breast tumor. <sup>18</sup>F-FDG PET/CT may provide valuable information for staging and surveillance, especially in patients with atypical metastatic patterns. This case highlights that unexpected metastatic sites can significantly affect treatment strategies and are frequently associated with worse prognosis.

**Keywords:** Small cell lung carcinoma, breast mass, breast metastasis, <sup>18</sup>F-FDG PET/CT

### Öz

Nefes darlığı, göğüs ağrısı ve sağ memede ele gelen kitle şikayeti olan 63 yaşında bir kadın hasta acil servise başvurdu. Kontrastsız bilgisayarlı tomografi (BT) sağ akciğer üst lobda ve sağ memede şüpheli kitlesel lezyonlar ve sağ hemitoraksta plevral efüzyon saptandı. Daha ayrıntılı değerlendirme için <sup>18</sup>F-florodeoksiglukoz (FDG) pozitron emisyon tomografisi (PET)/BT taraması yapıldı. Sağ memede, sağ akciğerde, karaciğerde, kemiklerde ve lenf düğümlerinde FDG alanında artış vardı. Histopatolojik değerlendirme, meme kitlesinin primer küçük hücreli akciğer karsinomundan kaynaklanan metastatik bir lezyon olduğunu doğruladı. Primer akciğer karsinomu nadiren memede metastatik lezyon olarak ortaya çıkar. Bu bulgu, özellikle primer meme tümöründen ayrı edilmesinde taniya zorluklar yaratır. <sup>18</sup>F-FDG PET/BT, özellikle atipik metastatik paternleri olan hastalarda evreleme ve izleme için değerli bilgiler sağlayabilir. Bu olguda, beklenmedik metastatik bölgelerin tedavi stratejilerini önemli ölçüde etkileyebileceğini ve sıklıkla daha kötü прогнозla ilişkili olduğunu vurgulamaktadır.

**Anahtar kelimeler:** Küçük hücreli akciğer karsinomu, memede kitle, meme metastazı, <sup>18</sup>F-FDG PET/BT

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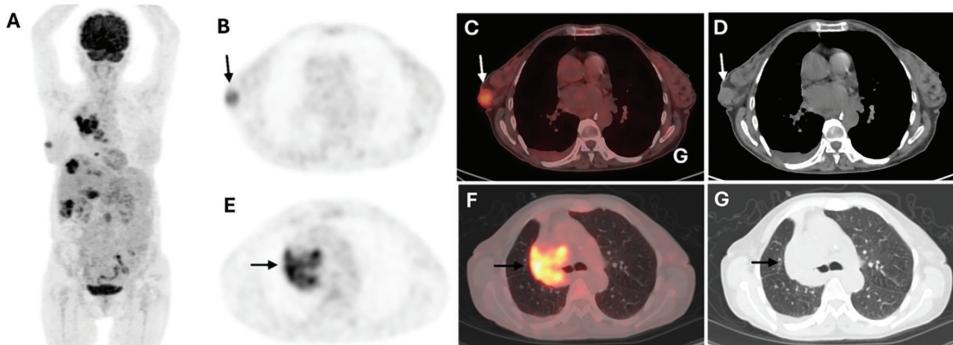
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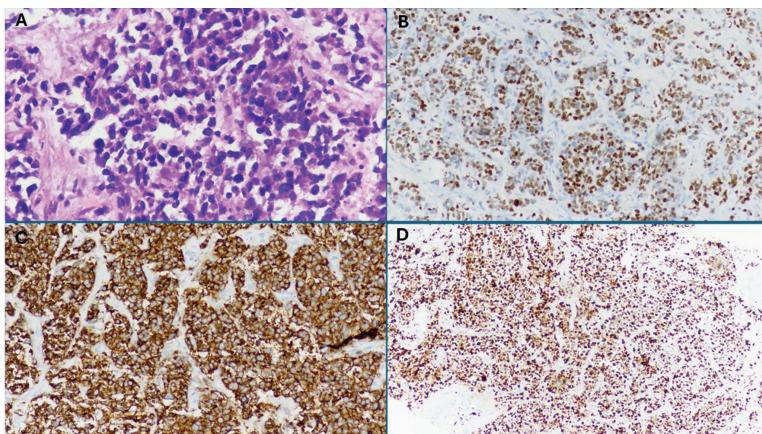
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**Figure 1.** A 63-year-old woman with dyspnea, chest pain, and a palpable right breast mass was referred to the emergency department. Non-contrast chest computed tomography (CT) revealed a mass measuring approximately 20 mm in the upper outer quadrant of the right breast. Furthermore, it showed the right upper lobe central lung mass, enlargement of several mediastinal lymph nodes, and a right pleural effusion. Written informed consent was obtained for each procedure. Subsequently, <sup>18</sup>F-fluorodeoxyglucose (FDG) positron emission tomography (PET)/CT performed for further evaluation. The maximum intensity projection (MIP) image demonstrated multiple foci of increased FDG uptake (A, MIP image). An increased FDG uptake [maximum standard uptake ( $SUV_{max}$ ), 4.2] was observed in the right breast mass (arrow) (B, PET image; C, fused PET/CT image; D, CT image). A centrally located mass in the right lung, indistinguishable from adjacent mediastinal lymph nodes, demonstrated an increased FDG uptake ( $SUV_{max}$ : 8.7) (E, PET image; F, fused PET/CT image; G, CT image). Several hypermetabolic mediastinal ( $SUV_{max}$ : 5.6) and periportal ( $SUV_{max}$ : 4.5) lymph nodes were detected. Additional FDG-avid lesions were observed in the liver, and multiple bone sites (A). These findings were consistent with widespread metastatic disease.



**Figure 2.** Afterwards, a biopsy of the right breast mass was performed. Histopathological examination with hematoxylin and eosin (H&E) showed small-to medium-sized round to oval cells with scant cytoplasm. Many cells showed finely dispersed "salt-and-pepper" chromatin with inconspicuous nucleoli and a high nuclear-to-cytoplasmic ratio (A; H&E, x400). Strong and diffuse nuclear positivity for thyroid transcription factor-1 (TTF-1) was observed in the cells (B; TTF-1, x200). The cells also showed positivity for synaptophysin (C; synaptophysin, x200) and a high proliferative index of approximately 80% with Ki-67 (D; Ki-67, x100). These findings confirmed the diagnosis of small cell lung cancer (SCLC) that had metastasized to the right breast.

The extramammary metastases to the breast are an infrequent manifestation, and their prevalence has been reported to vary between 0.1% and 5.0% (1). The most common extramammary malignancies that metastasize to the breast are lymphoma, malignant melanoma, cancers of the lung, thyroid, gallbladder, cervix, and ovary (2). Metastatic involvement of the breast from extramammary solid organ tumors represents a significant diagnostic challenge in routine clinical practice. Breast metastasis from lung cancer is an extremely rare clinical manifestation with an incidence of 0.2-1.3% (3). It has been suggested that lung cancer cells can spread to the pleura, infiltrate the axillary lymph nodes, and then reach the ipsilateral breast via retrograde lymphatic pathways (4).

Breast metastases from non-SCLC (NSCLC) have been reported more frequently than those from SCLC metastases (5). However, SCLC metastases to the breasts have occurred synchronously. It may be that SCLC is a very aggressive entity and is characterized by rapid tumor growth. Most patients have widespread metastases known as extensive-stage SCLC at the time of initial diagnosis (6). The most common metastatic sites of SCLC are mediastinal lymph nodes, liver, bone, and brain, respectively. It has been reported that the median overall survival for extensive-stage SCLC is approximately 12 months, while the 5-year survival rate for all SCLC patients remains only 6.8% (7). Furthermore, the median survival time for advanced-stage breast cancer patients with lung metastases has been reported to be approximately 21 months (8). An accurate diagnosis of breast mass is crucial in determining appropriate treatment strategies and improving patient outcomes. However, the clinical presentation of breast metastases concurrent with primary lung carcinoma is extremely rare and can complicate differential diagnosis. Consequently, in patients without a prior history of malignancy who present with a breast mass, both primary breast cancer and extramammary metastasis should be considered, as demonstrated in this case.

## Ethics

**Informed Consent:** Informed consent was obtained from the patient.

## Footnotes

### Authorship Contributions

Surgical and Medical Practices: H.T.K., A.T.A., Concept: N.A.D., Ö.Ö., Design: N.A.D., D.Ç., Ö.Ö., Data Collection or Processing: D.Ç., H.T.K., A.T.K., Analysis or Interpretation: N.A.D, D.Ç., Literature Search: N.A.D., Ö.Ö., Writing: N.A.D D.Ç.

**Conflict of Interest:** No conflicts of interest were declared by the authors.

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