



Long-term Intense ¹⁸F-FDG Uptake by the Homeostatic Matrix-associated Inflammatory Response May Mimic Malignancy Recurrence

Homeostatik Matriks ile İlişkili Enflamatuvar Yanıtta Gözlenen Uzun Dönem Yoğun ¹⁸F-FDG Tutulumu, Malignite Nüksünü Taklit Edebilir

✉ Fatih Tamer¹, ✉ Bülent Yazıcı², ✉ Aylin Oral², ✉ Ayşegül Akgün²

¹Niğde Ömer Halisdemir University Training and Research Hospital, Department of Nuclear Medicine, Niğde, Türkiye

²Ege University Faculty of Medicine, Department of Nuclear Medicine, Izmir, Türkiye

Abstract

A 70-year-old man underwent right upper lobectomy for lung adenocarcinoma. During the operation, hemostatic matrix (as known Floseal[®]) was used to prevent pulmonary laceration-associated bleeding. When ¹⁸F-fluorodeoxyglucose (FDG) positron emission tomography/computed tomography was performed for staging after surgery, intense ¹⁸F-FDG uptake was observed in the cicatricial fibrotic tissue in the operation area, and no significant change was observed in that area during the 4-year follow-up. Because it remained stable for several years without treatment, this finding was thought to be due to a foreign body reaction caused by the homeostatic material.

Keywords: Homeostatic matrix, false positivity, positron emission tomography, lung cancer

Öz

Yetmiş yaşında bir erkek hastaya, akciğer adenokarsinomu nedeniyle sağ üst lobektomi uygulandı. Operasyon sırasında, pulmoner laserasyona bağlı kanamayı önlemek için homeostatik matriks (Floleal[®]) kullanıldı. Operasyon sonrasında evreleme amacıyla ¹⁸F-florodeoksiglukoz (FDG) pozitron emisyon tomografisi/bilgisayarlı tomografi yapıldığında girişim bölgesindeki skatrisyel fibrotik dokuda yoğun ¹⁸F-FDG tutulumu saptandı ve 4 yıllık takibinde bu bulguda anlamlı bir değişiklik gözlenmedi. Sürecin bir bölümünde tedavi uygulanmayan ve stabil olarak izlenen bulguların homeostatik materyalin neden olduğu yabancı cisim reaksiyonundan kaynaklandığı düşünüldü.

Anahtar kelimeler: Homeostatik matriks, yanlış pozitiflik, pozitron emisyon tomografisi, akciğer kanseri

Address for Correspondence: Fatih Tamer MD, Niğde Ömer Halisdemir University Training and Research Hospital, Department of Nuclear Medicine, Niğde, Türkiye

Phone: +90 388 232 22 20 **E-mail:** drfatihtamer@gmail.com ORCID ID: orcid.org/0000-0002-5656-9955

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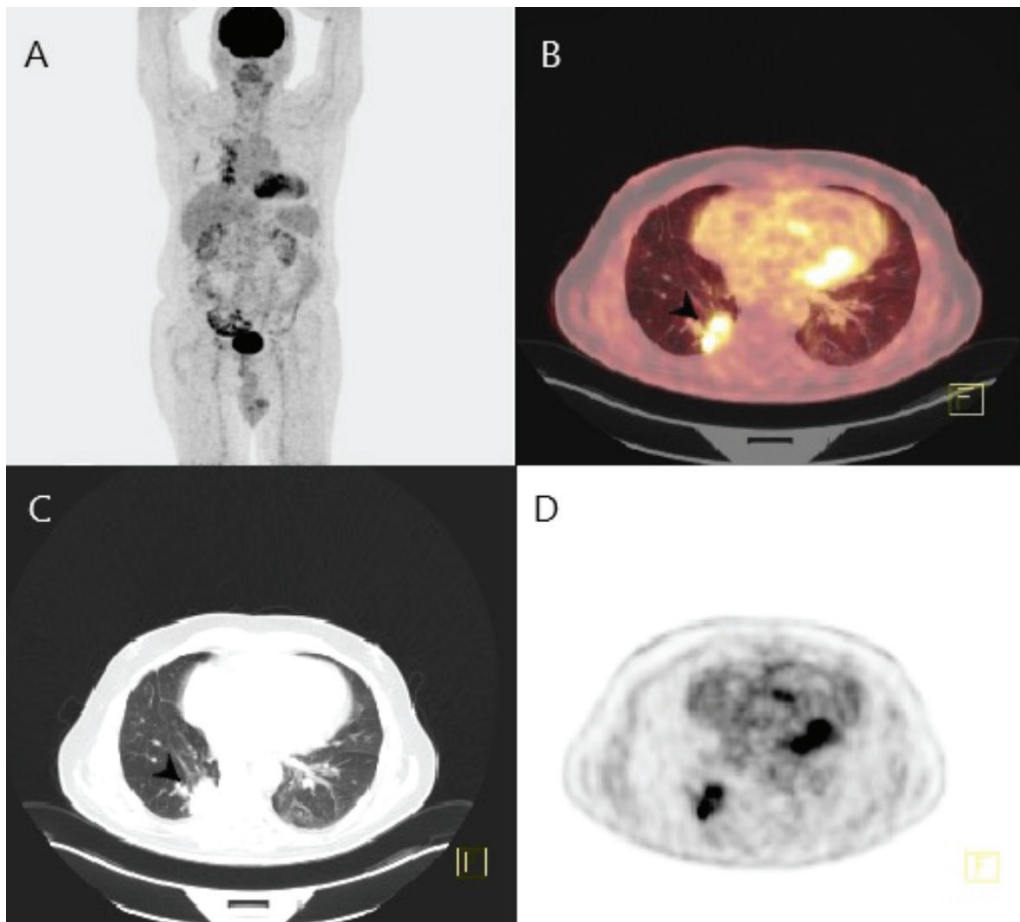


Figure 1. In lung cancer, ^{18}F -fluorodeoxyglucose positron emission tomography/computed tomography (^{18}F -FDG PET/CT) imaging plays an important role in the diagnosis, staging, treatment response, and detection of regional recurrence. In addition to malignancies, many infectious-inflammatory processes and benign neoplasms in the lungs can show increased ^{18}F -FDG uptake and mimic malignancies (1). Whole body ^{18}F -FDG PET/CT was performed for staging in a 70-year-old man with lung adenocarcinoma who had undergone right upper lobectomy. Images were acquired 60 min after intravenous administration of 8.7 mCi of ^{18}F -FDG. Axial PET, CT, fused PET/CT, and maximum intensity projection (MIP) images revealed intense ^{18}F -FDG uptake in nodular consolidations, as seen in cicatricial fibrotic tissue at the resection site (images A-D; black arrow). Because the patient did not receive radiotherapy and did not have clinical and laboratory signs of infection the findings were initially thought to be due to local recurrence, and the patient was followed up with a chemotherapy regimen.

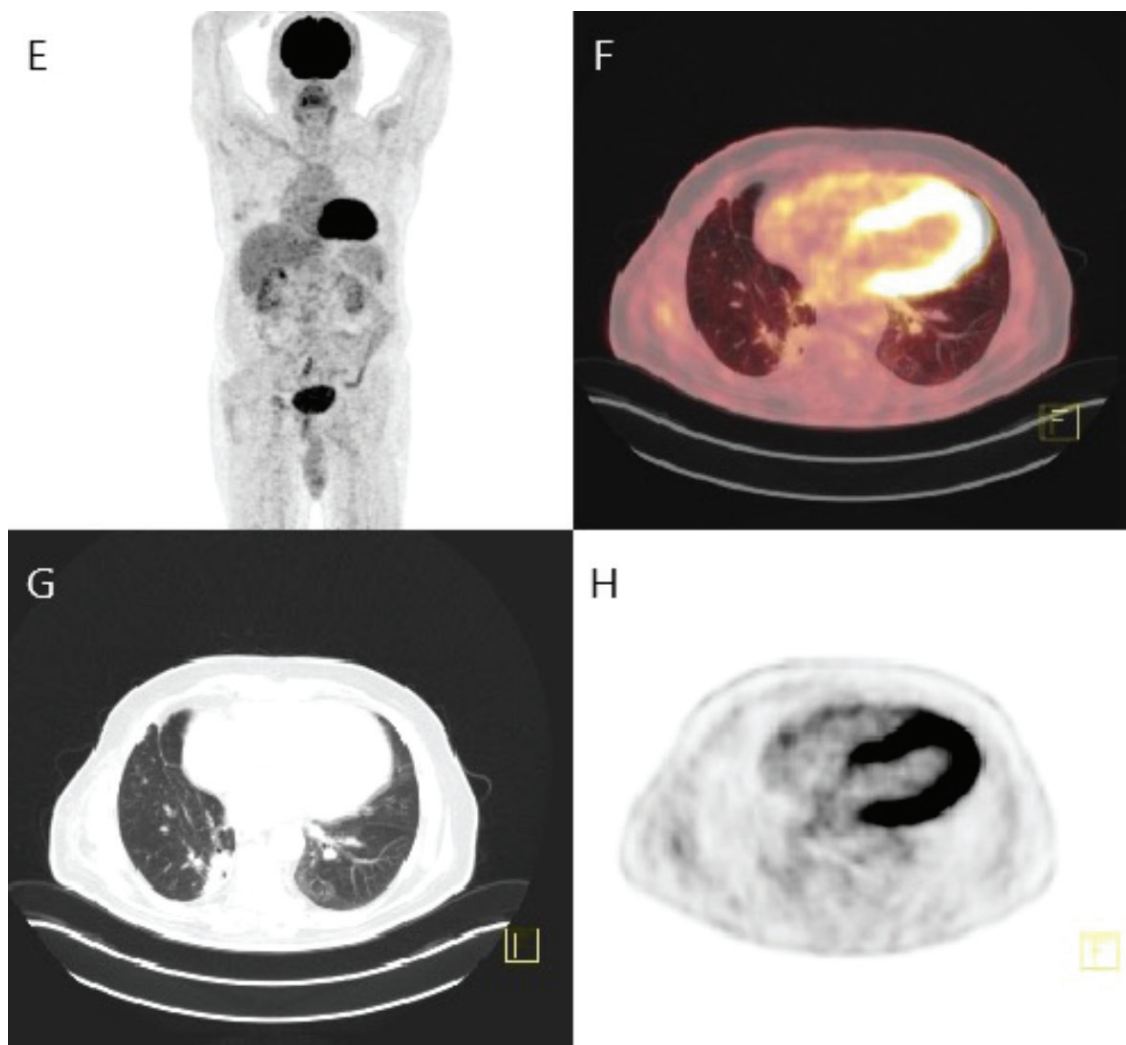


Figure 2. In serial follow-up ^{18}F -FDG PET/CT scans for 4 years, no significant morphological and metabolic changes were observed, although chemotherapy was not applied in the last 2 years of this period. In addition, on axial MIP, PET, CT, fused PET/CT, and MIP images taken after the 4-year period, ^{18}F -FDG uptake in this field had regressed (images E-H). When the surgical reports were examined in detail, it was observed that hemostatic material was used to prevent bleeding due to pulmonary laceration during the operation. Hemostatic agents are used in most surgical procedures to control bleeding complications and prevent secondary morbidity and mortality. The homeostatic matrix (as known Floseal[®]) is one of the agents used for this purpose and consists of the bovine gelatin matrix and human thrombin component (2). It is known that foreign body reaction and inflammatory response to materials used in surgery practice may cause increased ^{18}F -FDG uptake, which may continue for a long time in follow-up (3,4). In some publications related to thoracic surgery practice, false-positive ^{18}F -FDG avidity has been defined as mimicking malignancy such as suture granuloma (5,6,7). And another paper also demonstrated the development of false-positive ^{18}F -FDG-avid pulmonary nodules secondary to polysaccharide-based hemostatic agent use, mimicking metastasis (8). We considered that this increased ^{18}F -FDG uptake is associated with a chronic inflammatory response to the homeostatic material, which is used to control bleeding due to pulmonary laceration during pulmonary lobectomy surgery. Although not in this study, defining false positive findings using pathological sampling when necessary is important in preventing unnecessary treatments and additional investigations. We emphasize that in interpreting the pathological findings on PET/CT images, patients' information, including surgical reports, should be examined in detail, and the surgical materials used and the places where it was applied should be considered.

Ethics

Informed Consent: Informed consent was obtained from the patient.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: F.T., B.Y., A.O., A.A., Concept: F.T., B.Y., A.O., A.A., Design: F.T., B.Y., A.O., A.A., Data Collection or Processing: F.T., A.A., Analysis or Interpretation: F.T., B.Y., A.O., A.A., Literature Search: F.T., A.A., Writing: F.T., A.A.

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