Interesting Image

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Distinguishing Bronchial Carcinoid from Benign Bronchocele using ^{68}Ga-DOTATOC PET/CT Imaging

^{68}Ga-DOTATOC PET/BT Görüntüleme Kullanılarak Bronşiyal Karsinoidin Benign Bronkoselden Ayırılması

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Abstract

Bronchial carcinoids are low-grade neuroendocrine tumors with slow growth rates and the potential to spread to nearby lymph nodes. Here we present a challenging case of bronchial carcinoid visualized alongside an adjacent benign bronchocele. Chest computed tomography (CT) identified the endobronchial mass with unclear morphological and diagnostic insights. A differential diagnosis of several benign and malignant etiologies was made. Subsequently, an endobronchial biopsy confirmed lung carcinoid. For better evaluation, a ^{68}Ga-labeled 1,4,7,10-tetraazacyclododecane-N,N′,N′′,N′′′-tetraacetic acid-d-Phe1-Tyr3-octreotide (^{68}Ga-DOTATOC) positron emission tomography/CT scan was performed. The scan revealed a locally confined endobronchial mass with intense ^{68}Ga-DOTATOC expression. Adjacent benign bronchocele was visualized with insignificant ^{68}Ga-DOTATOC expression. Histopathological examination of the resected upper lobe confirmed these findings. This case highlights the importance of somatostatin receptor imaging in accurately identifying the extent of carcinoid tumors in the primary, nodal, and metastatic domains.

Keywords: Bronchocele, bronchial carcinoid, diagnostic challenge, ^{68}Ga-DOTATOC, somatostatin receptor imaging, PET/CT

Öz

Bronşiyal karsinoidler, yavaş büyüme oranlarına sahip ve yakındaki lenf düğümlerine yayılma potansiyeli olan düşük dereceli nöroendokrin tümörlerdir. Burada komşu benign bronkoselin yanında görüntülenen zorlu bir bronşiyal karsinoid olgusu sunulmaktadır. Bilgisayarlı toraks tomografisi (BT), belirsiz morfolojik ve tanısal bilgilerle endobronşiyal kitleyi tanımladı. Çeşitli benign ve malign etiyolojilerin ayırıcı tanısı yapıldı. Daha sonra endobronşiyal biyopsi akciğer karsinoidini doğruladı. Daha iyi değerlendirme için, ^{68}Ga etiketli 1,4,7,10-tetraazasiklododekan-N,N′,N′′,N′′′-tetraasetik asit-d-Phe1-Tyr3-oktreotid (^{68}Ga-DOTATOC) pozitron emisyon tomografisi/BT taraması yapıldı. Tarama, yoğun ^{68}Ga-DOTATOC ekspresyonuna sahip lokal olarak sınırlı bir endobronşiyal kitleyi ortaya çıkardı. Komşu benign bronkosel, önemsiz ^{68}Ga-DOTATOC ekspresyonuyla görüntülendi. Rezeke edilen üst lobun histopatolojik incelemesi bu bulguları doğruladı. Bu olgu, primer, nodal ve metastatik alanlardaki karsinoid tümörlerin boyutunun doğru bir şekilde belirlenmesinde somatostatin reseptörü görüntülemesinin önemini vurgulamaktadır.

Anahtar kelimeler: Bronkosel, bronşiyal karsinoid, tanısal zorluk, ^{68}Ga-DOTATOC, somatostatin reseptörü görüntülemesi, PET/BT

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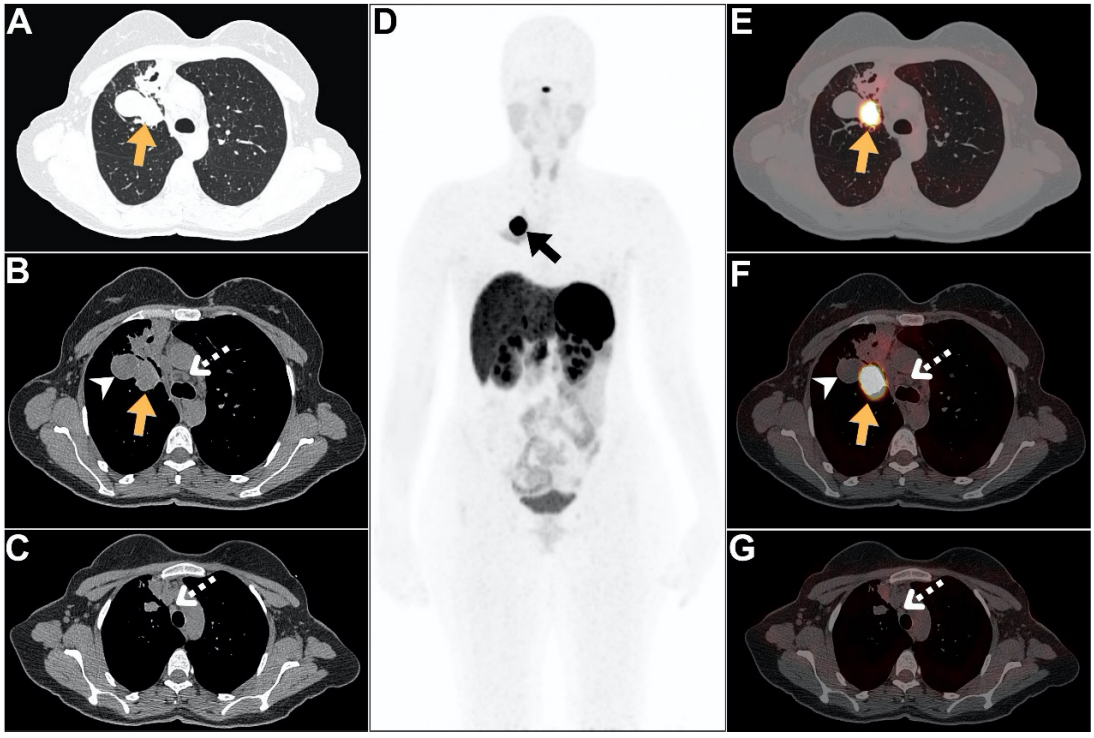

Figure 1. A 36-year-old female presented with progressive, productive cough over the last 2 months. Upon consultation, the patient denies any previous history of medical diseases or surgical operations but reports a positive family history of cancer. Chest computed tomography (CT) revealed a large right peribronchial mass lesion (A, B; arrows), an adjacent cystic density (B, arrowhead), and few prominent mediastinal lymph nodes (B, C, dotted arrows). The differential diagnosis includes endobronchial obstructing tumor, atypical pneumonia, or granulomatous disease. Therefore, an endobronchial biopsy was performed for a definitive diagnosis and revealed evidence of lung carcinoid. Shortly thereafter, the patient was transferred to our cancer center for further examination. For optimal staging prior to surgical intervention, a whole-body ^{68}Ga-labeled 1,4,7,10-tetraazacyclododecane-N,N′,N′′,N′′′-tetraacetic acid-d-Phe1-Tyr3-octreotide (^{68}Ga-DOTATOC) tumor, nodal, metastatic domains (TNM) scan was ordered. The scan identified the right endobronchial mass with intense somatostatin receptor (SSTR) expression (D, E, F, arrows). The maximum standardized uptake value was 89.2 (D, E, F, arrows). In addition, the adjacent cystic density demonstrated insignificant SSTR expression, indicating a benign etiology and confirming post-obstructive bronchocele (F, arrowhead). Moreover, few mediastinal lymph nodes with insignificant ^{68}Ga-DOTATOC avidity were concluded to be mostly benign in nature (F, G; dotted arrows). Following a multidisciplinary clinic meeting, the patient underwent a right upper lobectomy with mediastinal lymphadenectomy, which revealed a locally confined 2.5 cm typical carcinoid tumor. The tumor, nodal, and metastatic domains (TNM) staging was found to be T1cN0 and was labeled as stage IA disease. The patient is doing well after surgery and will undergo the necessary follow-up after that.

Bronchial carcinoids constitute 2% of all pulmonary malignancies (1). These tumors display various clinical, morphological, and biological patterns (1). Bronchial carcinoids may exhibit concurrent bronchocele in proximity (2). Bronchoceles, also termed bronchial mucocele, are typically benign but may masquerade as part of the primary tumor, leading to disease upstaging (2). CT evaluation alone may complicate precise tumor size determination due to density similarities and proximity (3). Occasionally, cystic malignancies were incorrectly identified by CT as mucocele or bronchocele (4,5). In such scenarios, SSTR imaging aids in accurate disease diagnosis. This unique case highlights the first instance in which ^{68}Ga-DOTATOC PET/CT discriminated a bronchial carcinoid tumor from a subsequent bronchocele. These findings underscore the important role of SSTR imaging in distinguishing benign bronchocele from endobronchial carcinoid, ensuring precise staging across TNM.

Ethics

Informed Consent: Informed consent was obtained from the patient.

Authorship Contributions

Surgical and Medical Practices: A.A.-I., R.A., B.A., A.S.A., H.H., Concept: A.A.-I., R.A., B.A., A.S.A., Design: A.A.-I., R.A., B.A., Data Collection or Processing: A.A.-I., R.A., B.A., H.H., Analysis or Interpretation: A.A.-I., A.S.A., H.H., Literature Search: R.A., A.S.A., Writing: A.A.-I., A.S.A.

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