

# *Nocardia* Infection With Adrenal Gland Abscess Mimicking Metastatic Lung Cancer on FDG PET/CT

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**Abstract:** We present FDG PET/CT findings of a human immunodeficiency virus–positive patient suspicious for lung cancer with a solitary metastasis to the adrenal gland. Wedge resection of the pulmonary nodules revealed *Nocardia* infection and a repeat FDG PET/CT imaging after the antibiotic treatment demonstrated complete metabolic response of the adrenal lesion and pulmonary nodules. It should be kept in mind that nocardiosis may present with FDG-avid lesions masquerading as malignancies in immunocompromised patients.

**Key Words:** *Nocardia*, pulmonary nocardiosis, adrenal gland abscess, FDG PET/CT

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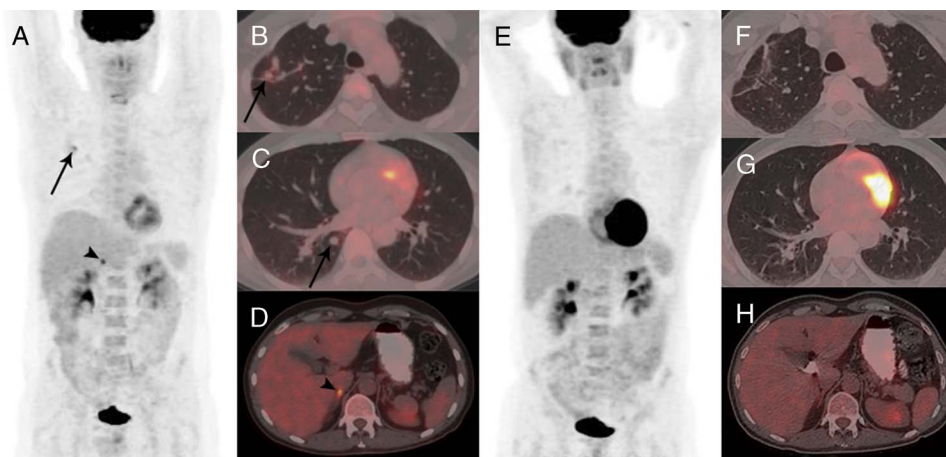
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## REFERENCES

1. Longhitano A, Alipour R, Khot A, et al. The role of <sup>18</sup>F-fluorodeoxyglucose positron emission tomography/computed tomography (FDG PET/CT) in assessment of complex invasive fungal disease and opportunistic co-infections in patients with acute leukemia prior to allogeneic hematopoietic cell transplant. *Transpl Infect Dis*. 2021;23:13547.
2. Playe M, Einfalt M, Toch SR, et al. <sup>18</sup>F-FDG imaging of a case of disseminated nocardiosis. *Clin Nucl Med*. 2020;45:55–56.
3. Margalit I, Yahav A, Ben Ari Y, et al. The role of 18-fluorodeoxyglucose positron emission tomography/computed tomography (FDG-PET/CT) in management of nocardiosis: a retrospective study and review of the literature. *Infect Dis Ther*. 2021;10:2227–2246.
4. Prabhu M, Raju S, Chakraborty D, et al. Spectrum of <sup>18</sup>F-FDG uptake in bilateral lung parenchymal diseases on PET/CT. *Clin Nucl Med*. 2020;45:15–19.
5. Erdemir RU, Elri T, Sahin H, et al. Disseminated *Nocardia* infection mimicking malignancy on FDG PET/CT. *Rev Esp Med Nucl Imagen Mol*. 2015;34:268–269.
6. Kodaganur Gopinath S, Pulle MV, Dhamija A, et al. A rare disease mimicking lung cancer. *Indian J Tuberc*. 2020;67:430–432.
7. Mascarenhas NB, Lam D, Lynch GR, et al. PET imaging of cerebral and pulmonary *Nocardia* infection. *Clin Nucl Med*. 2006;31:131–133.
8. Jackson C, McCullar B, Joglekar K, et al. Disseminated *Nocardia farcinica* pneumonia with left adrenal gland abscess. *Cureus*. 2017;9:1160.
9. Langmaid T, Jassal K, Meher-Homji Z, et al. Disseminated nocardiosis with adrenal abscess masquerading as metastatic adrenal cancer in an immunocompetent adult. *ANZ J Surg*. 2021;91:396–398.
10. Jackson LE, Shorman M. A case of bilateral *Nocardia francinica* adrenal abscesses in an intravenous drug-using splenectomized patient with tricuspid endocarditis. *Open Forum Infect Dis*. 2018;5:141.
11. Tachezy M, Simon P, Ilchmann C, et al. Abscess of adrenal gland caused by disseminated subacute *Nocardia farcinica* pneumonia. A case report and mini-review of the literature. *BMC Infect Dis*. 2009;9:194.
12. Tramèr L, Mertz KD, Huegli R, et al. Intra-abdominal nocardiosis—case report and review of the literature. *J Clin Med*. 2020;9:2141.



**FIGURE 1.** A 49-year-old man infected with the human immunodeficiency virus with a former history of tuberculosis presented with hemoptysis and thorax CT showed an irregular-shaped 1-cm pulmonary nodule in the right lung suspicious for malignancy. He was referred to FDG PET/CT to evaluate pulmonary nodule for malignancy. FDG PET/CT revealed mild FDG uptake in the nodular lesion in the apical segment of the upper lobe of right lung (arrows in **A**, MIP image; **B**, axial PET/CT image) and an amebiotic pulmonary nodule in the superior segment of the lower lobe of right lung (arrow in **C**, axial PET/CT image). Also, intense FDG uptake with an  $SUV_{max}$  of 7 was noted in the 1-cm nodular lesion in the right adrenal gland, suggestive of metastasis (arrowhead, **D**, axial PET/CT image). Wedge resection of the apical pulmonary nodule revealed necrotizing granulomatous inflammation, and microbiologic assessment showed Gomori methenamine silver-positive branching filamentous *Nocardia* spp. He received treatment for nocardiosis with trimethoprim/sulfamethoxazole, and a repeat FDG PET/CT showed complete regression of the adrenal lesion and pulmonary nodules (**E**, MIP image; **F**, **G**, **H**, axial PET/CT images). Nocardiosis is a rare, localized, or disseminated opportunistic infection caused by a Gram-positive, aerobic, filamentous bacteria, commonly affecting immunosuppressed patients, in whom it most commonly presents as pulmonary disease. Whole-body functional imaging with FDG PET/CT has an emerging role in the diagnosis of infection, identifying disease extent, defining the biopsy location, monitoring therapy response, and guiding therapy duration decisions for *Nocardia*.<sup>1-3</sup> Radiological features of pulmonary nocardiosis are nonspecific as it may present as consolidation, infiltration, solitary, or multiple nodules.<sup>4</sup> The clinical and radiological findings along with increased FDG uptake on PET scan may be misdiagnosed as malignancies.<sup>5,6</sup> Also, in extrapulmonary nocardiosis, malignancy is often suspected in the setting of the abdominal or brain abscess, which can lead to misinterpretation as metastatic disease.<sup>7</sup> Adrenal gland involvement in *Nocardia* infection is exceedingly rare and has been reported in a few case reports with immunocompetent and immunocompromised patients.<sup>8-11</sup> Adrenal abscess is usually confined to a single gland as a result of hematologic dissemination in disseminated nocardiosis patients or direct abdominal inoculation in peritoneal dialysis patients.<sup>12</sup> Despite its rarity in the clinical setting, this case hints us that nocardiosis may present with FDG-avid adrenal lesions, which could mimic metastatic disease, especially in patients with pulmonary nocardiosis.