

Simultaneous Brain and Lung Histiocytic Sarcoma Revealed on ^{18}F -FDG PET/CT

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Abstract: A 52-year-old man with intermittent head motor tics, aphasia and right upper extremity weakness had an ^{18}F -FDG avid left front lobe brain lesion, and a left upper lobe lung lesion on PET/CT. The brain lesion was surgically resected, and was diagnosed pathologically as a histiocytic sarcoma (HS). The lung lesion was also a HS via bronchial biopsy. HS is rare and generally involves nodes as shown on PET/CT in a few case reports. The current case with simultaneous brain and lung HS lesions adds new imaging pattern information of the disease to the literature.

Key Words: ^{18}F -FDG PET/CT, histiocytic sarcoma

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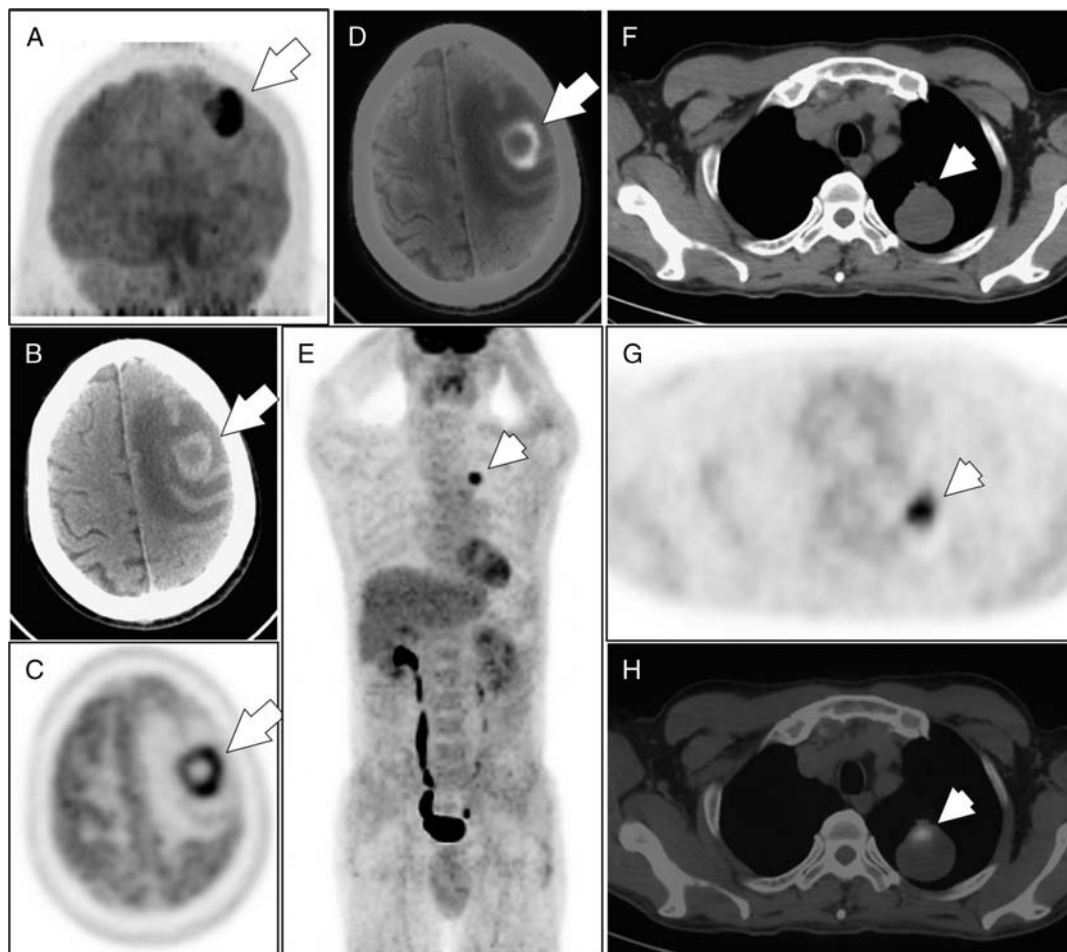


FIGURE 1. A 52-year-old man, who had symptoms of intermittent head motor tics, expressive aphasia and right upper extremity weakness for 10 days, was referred to our hospital in May 2016. This patient had a previous history of allogeneic liver transplantation for HBV-related liver cirrhosis in 2005, and a descending-colon adenocarcinoma tumorectomy in 2007. A brain CT and MR revealed a space-occupying lesion with surrounding edema and central necrosis, located in the left frontal lobe. A subsequent ^{18}F -FDG PET/CT scan showed annular ^{18}F -FDG uptake in the brain lesion with $\text{SUV}_{\text{max}} = 15.7$ (A, arrowed in maximum intensity projection of PET; B, C and D, respectively arrowed in CT, PET and fused PET/CT). Simultaneously, a round lesion with partial ^{18}F -FDG avidity ($\text{SUV}_{\text{max}} = 7.5$) was also detected in the left upper lobe of the lung (E, arrowed in maximum intensity projection of PET; F, G and H, respectively arrowed in CT, PET and fused PET/CT). Diagnosis of metastatic carcinoma was first suspected, given a history of colorectal carcinoma. Surgical resection of brain lesion was performed, and histopathological and immunohistochemical examinations finally showed a histiocytic sarcoma (HS).

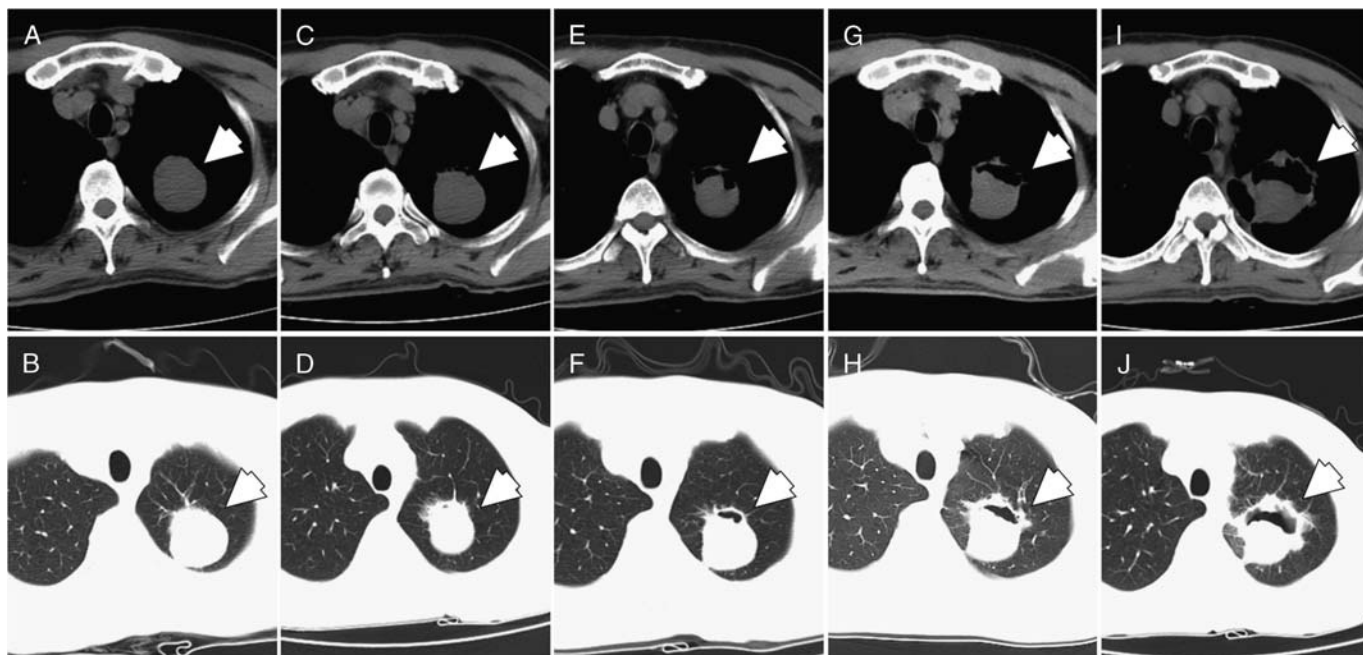


FIGURE 2. A needle biopsy of the lung lesion was initially performed 1 month after the brain surgery, which showed coagulative necrosis. Therefore, the patient underwent a series of follow-up chest CT examinations every 2–3 months from August 2016 to May 2017, which showed the lesion gradually enlarged with formation of a cavity inside (arrowed in all images; **A, C, E, G** and **I**, chest CT in mediastinal window; **B, D, F, H** and **J**, chest CT in pulmonary window; five lines of the images were respectively obtained in August, October, December 2016, and March, May 2017). In order to ascertain the lung lesion, a second needle biopsy was performed in May 2017, which again showed coagulative necrosis. As malignancy cannot be excluded, a bronchial mucosa biopsy of the left upper lobar bronchus was carried out, which finally showed HS as well. HS is a rare aggressive neoplasm, and is exceptionally rare in central nervous system.¹ The diagnosis of HS depends on positive immunohistochemical markers of CD68/PG-M1, CD163 and lysozyme, and it is typically negative for B- and T-cell markers.^{1,2} Though imaging features of HS involving lymph nodes,^{3–5} pericardium⁶ and other tissues on ¹⁸F-FDG PET/CT have been previously described in a few case reports, it is still considered indistinguishable from other malignant tumors on imaging studies. This case of HS occurs in the brain and lung simultaneously, which is an additional PET/CT imaging finding of the disease. The needle biopsy of the lung lesion twice showed necrosis, likely due to the improper biopsy of the ¹⁸F-FDG-negative part. This highlights the significance of ¹⁸F-FDG PET/CT guided needle biopsy, particularly for lesions with heterogeneous ¹⁸F-FDG uptake.^{7,8}