History and Findings
The patient is a 37-year-old woman with a history of colorectal cancer initially evaluated by PET in February 2008. The patient then underwent preoperative radiation therapy, followed by surgical resection of rectal cancer in early June 2008 and a course of systemic chemotherapy. A follow-up PET in October 2008 showed resolution of previously identified FDG uptake in the pelvis, consistent with treated malignancy. In both of the 2008 PET studies there was no evidence of metastatic disease in the upper abdomen or chest. However, subsequent CT studies in April and June of 2009 showed an enlarging solitary pulmonary nodule (SPN) in the right lung. A PET/CT conducted in late June 2009 showed a new, intense area of metabolic activity in the right upper lobe that was highly suspicious for malignancy, corresponding to the 11mm SPN seen on CT (Figure 1). This lung lesion was resected in July 2009. A follow-up PET/CT was performed in September 2009, with no new FDG uptake seen in the lung and no evidence of residual or recurrent malignancy (Figure 2).

Follow-Up
Pathology of the resected lung lesion indicated a metastatic adenocarcinoma consistent with a colorectal primary. As noted above, a follow-up PET/CT conducted several months after this resection in September 2009 showed no evidence of recurrence. A follow-up PET/CT has been scheduled for June 2010.

How Did FDG-PET/CT Help?
FDG-PET played a critical role in initial staging of the patient’s colorectal cancer and in monitoring the patient. Additionally, PET/CT helped in characterizing the SPN as suspicious for tumor.

Discussion
Clinicians have recognized the role that FDG-PET/CT can play in the management of a solitary metastatic lesion, particularly in determining if patients are candidates for metastasectomy or radiofrequency ablation of a lesion in the lung, liver, or a lymph node. If the metastasis is truly solitary, outcomes have been promising. In this case, PET/CT characterized the nodule as suspicious for tumor while it was still relatively small and at an early stage of metastatic disease. PET/CT helped confirm that the SPN was a solitary lesion and thus eligible for metastasectomy. Note should be made that nodules less than 1cm in size are too small to be reliably characterized by PET/CT.


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