

Sensitivity of PET/MR images in liver metastases with advanced colorectal carcinoma

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Abstract

Our aim was to evaluate the sensitivity of positron emission tomography/magnetic resonance image (PET/MRI) in the detection of liver metastases in patients with advanced colorectal cancer as compared with computed tomography (CT), magnetic resonance imaging (MRI), PET and PET/CT images. From April 2008 to April 2010, twenty-four patients (mean age 56.5 ± 10.5 years) with liver metastases from advanced colorectal cancer diagnosed by pathology were retrospectively studied as above. All image data were respectively collected and fused. PET/CT and PET/MRI fusion images were successfully performed with a PET-MR-CT robot transmission-fusion imaging system. Pathologic findings and clinical follow-up were performed as referenced standards. Images were reviewed independently by at least three experts. *We found* a total number of 121 metastatic lesions and 35 of them, with a maximum diameter less than 1cm. According to a per-lesion analysis, the sensitivity on liver metastases was 64.5%, 80.2% and 54.5% on CT, MRI and PET, respectively. Based on reconstruction imaging analysis, PET/CT and PET/MRI showed sensitivities of 84.2% and 98.3%. Sensitivity comparison of PET/MRI had superior sensitivity of 98.08%. Paired data analysis (McNemar) resulted a type I error which equated to 0.05. There was a statistically significant difference between CT and MRI or PET for the detection of patients with liver metastatic lesions ($P < 0.05$). However, PET/MRI can efficiently detect more metastatic lesions than PET/CT ($P < 0.05$) among those with diameter < 1 cm. *In conclusion*, PET/MRI was a quite efficient diagnostic modality compared to conventional imaging modalities and should be considered the procedure of choice in the detection of liver metastatic lesions in advanced colorectal cancer.

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