The examination of distinguishing from recurrence and radiation necrosis for malignant tumor with ^{11}C-methionine PET

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Abstract

Objective: The present study aimed to distinguish from recurrence and radiation necrosis for malignant tumor by ^{11}C-methionine PET (MET-PET) and arterial spin labeling (ASL) at 3.0T MRI.

Methods: We scanned MET-PET and ASL for 13 patients with malignant tumor. On MET-PET, the mean counts of radioisotope in tumor divided by the mean counts of radioisotope in normal brain. The ratio of the highest cerebral blood flow (CBF) in tumor divided by CBF in normal brain in the contralateral side (ASL CBF ratio) was calculated. Receiver operating characteristic (ROC) curve was calculated to determine the cut off values for distinguishing from recurrence and radiation necrosis for malignant tumor.

Results: ASL CBF ratio was higher in recurrence than in radiation necrosis for malignant tumor. The best ASL CBF ratio cutoff value was 1.06, which provided sensitivity of 73% and specificity of 100%, positive predictive value of 100% and negative predictive value of 40%.

Conclusion: The present study suggested ASL CBF ratio become an examination for assessment of distinguishing from recurrence and radiation necrosis for malignant tumor.