

¹⁸F-FDG PET in Evaluating Malignancies Compared with CT, MRI and Pathology In 58 Cases

L. Li

Air force General Hospital, Beijing, China

Purpose: This article discussed the practical application of ¹⁸F-FDG PET imaging techniques to depict, stage, or define recurrences for five important malignancies: lung cancer, colorectal and head-and-neck cancer, intracranial malignant glioma and primary or secondary hepatic malignant diseases. And comparisons of ¹⁸F-FDG PET with CT, MRI imaging were addressed specifically. **Methods:** We reviewed our initial experience with 48 malignant and ten non-malignant cases. Among malignant group, 36 cases were confirmed by operation or biopsy, Other ten non-malignant diseases, including brain infarction, post-radiotherapy necrosis or scar and lung abscesses were followed with CT or MRI at least 6 months. All patients received intravenous administration of ¹⁸F-FDG 10-15 mCi, followed by a 40 minutes uptake phase, and subsequent imaged using a Siemens ECAT 931 whole-body scanner with resolution of 4 mm FWHM in the center of the field of view. Filtered back projection reconstruction was used to display attenuated or non-attenuated corrected images. The result of ¹⁸F-FDG PET was retrospectively evaluated to assess the degree of uptake of ¹⁸F-FDG PET in the tumor tissues and compared with CT, MRI and pathology. CT and MRI exam were taken before or after PET study in two weeks. **Results:** ¹⁸F-FDG PET scans showed a significantly increased FDG metabolism in 47 malignant lesions. The tumor / normal tissue FDG uptake rate were 4.16 ± 2.11 . In 47 cases with neoplasm, ¹⁸F-FDG PET findings were constant with or further confirmed the CT or MRI diagnosis in 35/47 (74.5%) and 12/47 (253%) cases. Another one small intracranial metastasis (<0,6cm), shown on contrast MRI was not displayed by glucose metabolism Otherwise, the tumor / normal tissue FDG uptake rate were 0.86 ± 1.46 in ten non-malignant cases. Most of post-radiotherapy cerebral necrosis, which can't be distinguished on both contrast CT and MRI, showed FDG uptake defect. One cerebral infarction, previously diagnosed as intracranial metastasis on CT and MRI, had been corrected as infarction based on glucose metabolism. Other one lung abscess, shown dense FDG uptake on PET, was confirmed by typical manifestation on high resolution CT. **Conclusion:** Our preliminary clinical application of ¹⁸F-FDG PET imaging in oncology has demonstrated powerful advantages in characterizing tumor lesions, differentiating recurrent disease from treatment effects, staging tumors, evaluating the extent of disease, and monitoring therapy. But ¹⁸F-FDG PET still cant replace CT or MRI in malignance diagnosis. It will be used to approach and hopefully answer the difficult diagnosis problems which both CT and MRI can't adequately address at present Ifs clear that combined imaging analysis of PET and CT or MRI, which can give both and functional or metabolism changes of diseases, have an important and growing role in oncology clinical practice.