Oncology of the chest

Diagnostic usefulness of [^{18}F]FDG-PET/MRI in patients with Non-Small Cell Lung Cancer (NSCLC) - Pilot Study.

*R. Mroz[1], D. Jurgilewicz[2], B. Kuklinska[3], M. Mojsak[2], P. Szumowski[2], B. Kubas[4], M. Hladunski[2], A. Amelian[2], J. Mysliwiec[2]
[1]Medical University of Bialystok, Department of Lung Diseases and Tuberculosis (Bialystok, Poland)
[2]Medical University of Bialystok, Department of Nuclear Medicine (Bialystok, Poland)
[3]University Hospital , II Department of Lung Diseases and Tuberculosis (Bialystok, Poland)
[4]Medical University of Bialystok, Department of Radiology (Bialystok, Poland)

Introduction:

PET/MRI as a new hybrid imaging technic, which enables simultaneous whole body molecular magnetic resonance and metabolic positron emission tomography is promising tool in early and comprehensive diagnosis in oncological settings.

Purpose

The purpose of this study is evaluation of the impact of [^{18}F]fluorodeoxy-d-glucose positron emission tomography(PET)/3T whole body magnetic resonance (MR) hybrid study on staging and qualification for surgery of patients with NSCLC.

Methods

FDG-PET/MR was performed in 11 patients with tumors detected with computed tomography (CT), histologically confirmed as NSCLC. PET scans were obtained 60 min after injection of 295 ± 45 MBq [^{18}F]FDG). All patients underwent ^{18}F-FDG PET/MR and CE-MRI of the breast at 3T in the prone position with proper MR sequences. Quantitative assessment was performed by calculation of SUV_{MAX}. Tumor staging was performed separately by two nuclear medicine specialists and one radiologist.

Results

PET/MRI confirmed metabolically active tumor in the lesions localized by CT in all patients. In 4/11 infiltration of aorta and thorax were confirmed both by CT and PET/MR scans and patients were disqualified from thoracotomy. In 2/11 cases with solitary tumor results of PET/MRI did not confirm aorta infiltration shown on CT. In 5/11 cases FDG-PET/MRI was superior to CT and detected extrathoracic lymph node involvement and distant metastases.

Conclusion

FDG-PET/MRI is robust tool in NSCLC staging, which may reduce the number of invasive procedures, enabling optimal treatment strategy.