Diagnostic performance of 18F-FDG PET/contrast-enhanced CT versus contrast-enhanced CT alone for post-treatment detection of ovarian malignancy

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Abstract:

Objective: The aim of this study was to evaluate the diagnostic performance of combined fluorine-18 fluorodeoxyglucose (18F-FDG) PET/contrast-enhanced computed tomography (Ce-CT) in comparison with Ce-CT alone for the detection of residual/recurrent tumor after initial treatment of malignant ovarian tumors. Patients and methods: The study prospectively recruited 111 patients with a clinical suspicion of ovarian tumor recurrence. Each patient underwent 18F-FDG PET/computed tomography (CT) with low-dose CT, followed immediately by Ce-CT. Study-based analyses for a total of 136 scans were carried out. For each study, 11 subsites were assessed on a four-point score (score 0 = definitely benign, score 1 = probably benign, score 2 = probably malignant, and score 3 = definitely malignant). The subsites were collectively categorized into four groups: local tumor site, peritoneum, pelvi-abdominal lymph nodes, and other sites (e.g. liver, lung, bone, brain, etc). The final diagnosis of disease status was made on subsequent follow-up by conventional imaging (CT/MRI), 18F-FDG PET/CT, or histopathology whenever possible. Results: Of the 136 studies evaluated, 97 (71%) studies had recurrent/residual disease and 39 (29%) studies were disease free on the basis of the final diagnosis. 18F-FDG PET/Ce-CT and Ce-CT had a sensitivity, specificity, negative predictive value, positive predictive value, and accuracy of 96 versus 84%, 92 versus 59%, 90 versus 59%, 97 versus 84%, and 95 versus 76%, respectively. 18F-FDG PET/Ce-CT was significantly more sensitive, specific, and accurate compared with Ce-CT, with P-values of 0.002, 0.001, and less than 0.0001, respectively. Site-based analyses also showed significant differences. Conclusion: Combined 18F-FDG PET/Ce-CT significantly outperforms Ce-CT alone in the post-treatment detection of malignant ovarian tumors.

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