

Localization and prediction of malignant potential in recurrent pheochromocytoma/paraganglioma (PCC/PGL) using 18F-FDG PET/CT

ABSTRACT

Background: To our knowledge, data are lacking on the role of 18F-FDG PET/CT in the localization and prediction of neuroendocrine tumors, in particular the pheochromocytoma/paraganglioma (PCC/PGL) group. **Purpose:** To evaluate the role of 18F-FDG PET/CT in localizing and predicting the malignant potential of PCC/PGL. **Material and Methods:** Twenty-three consecutive patients with a history of PCC/PGL, presenting with symptoms related to catecholamine excess, underwent 18F-FDG PET/CT. Final confirmation of the diagnosis was made using the composite references. PET/CT findings were analyzed on a per-lesion basis and a per-patient basis. Tumor SUVmax was analyzed to predict the dichotomization of patient endpoints for the local disease and metastatic groups. **Results:** We investigated 23 patients (10 men, 13 women) with a mean age of 46.43 ± 3.70 years. Serum catecholamine levels were elevated in 82.60% of these patients. There were 136 sites (mean SUVmax: 16.39 ± 3.47) of validated disease recurrence. The overall sensitivities for diagnostic CT, FDG PET, and FDG PET/CT were 86.02%, 87.50%, and 98.59%, respectively. Based on the composite references, 39.10% of patients had local disease. There were significant differences in the SUVmax distribution between the local disease and metastatic groups; a significant correlation was noted when a SUVmax cut-off was set at 9.2 ($P < 0.05$). **Conclusion:** In recurrent PCC/PGL, diagnostic 18F-FDG PET/CT is a superior tool in the localization of recurrent tumors. Tumor SUVmax is a potentially useful predictor of malignant tumor potential.

Keyword: 18F-FDG PET/CT; Malignant potential; Neuroendocrine; Pheochromocytoma/paraganglioma; Predictor; Recurrence; SUVmax