additional 2 cases both diagnosed as PNET, PET/CT identified falsely positive liver lesions. Conclusions: In the majority of our patients the suspected diagnosis of PNET, based on the radiological findings, was confirmed by subsequent investigations. Although the majority of PNET identified by MDCT resulted positive using PET/CT, EUS-FNA remains necessary to confirm suspected PNET. However, in patients affected by PNET PET/CT may be useful to provide additional clinical information and to stage patients. Additionally, the degree of radiotracer uptake at PET/CT may be useful to guide the treatment decision in patients with PNET.

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68Ga-Dotatate PET/CT assessments in Insulinomas

F. Novruzov[1,2], D. A. Aliyev[2], J. Bomanji[1], S. Wan[1], J. Connelly[1], I. Kayani[1]; [1]University College London Hospital, Institute of Nuclear Medicine, London, UNITED KINGDOM, [2]Azerbaijan National Research Institute of Oncology, Baku, AZERBAIJAN.

Abstract Introduction: 68Ga-Dota-DPhe1, Tyr3-octreotate (68Ga-Dotatate) is a novel selective somatostatin analogue ligand which shows increased affinity for somatostatin receptor subtype 2 (SST2) and has been increasingly used for imaging neuroendocrine tumours with PET/CT. We investigated the utility of 68Ga-Dotatate positron emission tomography/computed tomography (PET/CT) in patients with benign and malignant insulinomas. Methods: We enrolled forty consecutive patients (17 men, 23 women), mean age of 47.3 (range: 8-83) who underwent 68Ga-Dotatate PET/CT on basis of a) suspected insulinoma (10/40), b) suspected recurrent insulinoma (15/40) and c) localisation of biochemically proven insulinoma (15/40). 68Ga-Dotatate PET/CT findings were correlated with final diagnosis and results of conventional imaging modalities (diagnostic CT and MRI). Results: In 40 patients 68Ga-Dotatate PET/CT was true positive in 20, true negative in 13, false negative in 5 and false positive in two. Overall sensitivity, specificity, PPV and NPV 40 patients for 68Ga-Dotatate was 80%, 87%, 0.9 and 0.72. There was a significant difference (p=0.046) for detection of benign versus malignant insulinomas with 68Ga-Dotatate. The sensitivity, specificity, PPV and NPV of 68Ga-Dotatate for benign tumours was 64 %, 100 %, 1 and 0.5. The sensitivity, specificity, PPV and NPV of 68Ga-Dotatate for malignant tumours was 100%, 100%, 1, and 1. 68Ga-Dotatate PET/CT was able to localise insulinoma in 3 patients with false negative CT/MRI. In 1 patient insulinoma was positive with CT/MRI but false negative with 68Ga-Dotatate PET/CT. In 3 patients 68Ga-Dotatate PET/CT and CT/MRI were false negative for benign insulinomas. Conclusion: 68Ga-Dotatate PET/CT is useful to determine the presence of insulinoma. 68Ga-Dotatate has a higher sensitivity in patients with malignant versus benign tumours. Key Words: Insulinoma, Neuroendocrine Tumour; PET/CT; 68Ga-Dotatate, PET.

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68Ga-DOTATATE PET/CT evaluation of patients with neuroendocrine metastatic carcinoma of unknown origin is influenced by lesion differentiation

O. Alonso[1,2], M. Rodriguez Taroco[1], E. Savio[1], C. Bentancourt[1], J. P. Gambini[1,2], H. Engler[1]; [1]Uruguayan Center of Molecular Imaging (CUDIM), Montevideo, URUGUAY, [2]Nuclear Medicine Center, Clinical Hospital, University of Uruguay, Montevideo, URUGUAY.

Objective. There is little evidence regarding the role of 68Ga-DOTATATE PET/CT for the identification of primary tumors in patients with metastatic neuroendocrine carcinoma of unknown primary. The aim of this study is to assess the value of this technique in the mentioned clinical scenario and to compare these results with the degree of metastatic lesion differentiation. Methods. We studied twenty-nine patients (mean age: 59.5±10.6 years; female: 17) with pathologically proven neuroendocrine metastases. In all cases conventional imaging was negative for primary tumor identification. 68Ga-DOTATATE PET/CT was performed with a mean dose of 104.2±18.8 MBq, using a 64-slice PET/CT with time-of-flight correction. A team of an experienced radiologist and a nuclear medicine physician evaluated the images. The maximum SUV (SUVm) was measured in all abnormal foci. Histopathology (when available) and/or clinical follow up with correlative imaging were considered as reference standard. Results. 68Ga-DOTATATE PET/CT identified the primary tumor in 17/29 (59%) patients in the following locations: pancreas (n=7), ileum (n=7), duodenum (n=1), colon (n=1) and stomach (n=1). In this population a significant correlation was found between SUVm of primary tumor and metastases (r=0.815, P<0.0001). Furthermore, additional sites of unsuspected metastases were demonstrated in 9 patients of this group and in 6 patients in whom no primary tumor was localized, mainly in lymph nodes and mesentery. Pathology confirmation of primary tumors was obtained in 7 patients who underwent surgery, whereas in the remaining 10 patients, correlative imaging and follow-up confirmed primary tumor localization. WHO classification of neuroendocrine tumor differentiation revealed that all patients with PET/CT positive scans for primary tumor localization (n=17) had well-differentiated neuroendocrine metastatic lesions. However, the remaining group had either well-differentiated (n=4), moderately (n=3) or poorly differentiated lesions (n=5). Conclusions. 68Ga-DOTATATE PET/CT is a clinically useful imaging technique for the localization of primary tumors in patients with well-differentiated neuroendocrine carcinomas of unknown primary with the potential of having a significant impact in patient management and therapy planning.

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Prognostic evaluation of 68Ga-DOTANOC PET/CT and 18F-FDG PET/CT in patients with neuroendocrine tumors

P. Sharma[1], N. Naswa[1], L. A. Alvarado[2], A. K. Dwivedi[2], R. Kumar[1], C. Bal[1]; [1]All India Institute of Medical Sciences, New Delhi, INDIA, [2]Texas Tech University Health Sciences Center, El Paso, TX, UNITED STATES.

Purpose: To evaluate the prognostic value of 68Ga-DOTANOC PET/CT in patients with neuroendocrine tumors (NET), and compare the same with 18F-FDG PET/CT and other conventional clinicopathological prognostic factors. Methods: Data of 40 consecutive patients (age: 47.2±13.8 years; 55% male) with NET who underwent 68Ga-DOTANOC PET/CT and 18F-FDG PET/CT were analyzed. All patients underwent a baseline visit and laboratory and radiologic examinations. Clinical and imaging follow-up was performed in all cases. Progression free survival (PFS) was measured from the date of first PET/CT to the first documentation of progression of disease. Results: 68Ga-DOTANOC PET/CT was positive in 39/40 and 18F-FDG PET/CT was positive in 24/40 patients. During follow up 13/40 (32.5%) patients showed progression of disease and 27/40 (67.5%) patients showed no progression (stable disease-24, partial response-3). The median follow up was 24 months (range: 2-52). Among the variables evaluated only SUVmax on 68Ga-DOTANOC PET/CT was significantly different between progressive and non-progressive disease groups (P=0.011). In the univariate analysis for PFS outcome, SUVmax on 68Ga-DOTANOC PET/CT (HR: 0.119; 95% CI: 0.028-0.495; P=0.003), SUVmax on 18F-FDG PET/CT (HR: 6.324; 95% CI: 1.396-28.654; P=0.016) and histopathological tumor grade (HR: 5.254; 95% CI: 1.395-19.79; P=0.014) were found to be associated with PFS. Other factors such as age, sex, primary site, Ki-67 index, TNM stage, 18F-FDG PET/CT status (positive/negative) and type of treatment were not significant. In multivariable analysis, only SUVmax on 68Ga-DOTANOC PET/CT was found to be an independent positive predictor of PFS (HR: 0.151; 95% CI: 0.026-0.880; P=0.035). Conclusions: SUVmax measured on 68Ga-DOTANOC PET/CT in an independent, positive prognostic factor in patients with NET and is superior to 18F-FDG PET/CT and conventional clinicopathological factors for predicting PFS.

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Thyroid Incidentalomas detected by 68Ga-DOTANOC PET/CT - Correlation of clinical findings and maximum standardized value uptake (SUVmax)

L. C. Sobral Violante[1], J. P. Teixeira[1], I. L. Sampaio[1], A. Duarte[2], O. Soares[1], F. Lopes[1], L. Costa[1], A. Fonseca[1], J. Couto[3], H. Duarte[1]; [1]Serviço de Medicina Nuclear- Instituto Português de Oncologia, Porto, PORTUGAL, [2]Instituto Politécnico de Bragança, Bragança, PORTUGAL, [3]Serviço de Endocrinologia- Instituto Português de Oncologia, Porto, PORTUGAL.

Aim: In this retrospective study we investigated the clinical relevance of focal increased 68Ga-DOTANOC uptake in the thyroid gland in patients with no previous history of thyroid disease. The aim was to assess the incidence of malignant disease in these incidental findings and to inspect the potential diagnostic SUVmax ability to differentiate malignant from benign lesions. Material and methods: A total of 954 68Ga-DOTANOC PET/ CT scans acquired between August 2010 and July 2013 were reviewed and 43 cases were retrospectively studied in which incidental thyroid 68Ga-DOTANOC increased uptake was reported. Eighteen patients (pts) were excluded due to previous history of thyroid disease. Patients found to have focal thyroid uptake were subsequently correlated with thyroid ultrasonography (US), US-fine needle aspiration (FNA) cytology or pathology of the specimen from surgical excision. SUVmax of each focal abnormal thyroid uptake was calculated. Results: Thyroid incidentalomas was found by 68Ga-DOTANOC PET/CT in 2.6% of pts (25/954). Demographics on these 25 pts included 18 women, 7 men, an age range of 36 to 79 years and mean age of 58 years. Five pts did not have clinical follow-up and of the remaining 20 cases, 2 had an inconclusive FNA citology result and US did not reveal thyroid alterations in other 2. Conclusive diagnosis by US-FNA cytology or pathology of the specimen was available in 16 cases: 7 (44%) revealed malignant lesions (SUVmax: 2.36 to 9.63; average: 6.10; median: 6.22) corresponding to six well-differentiated papillary carcinoma and one case of secondary lesion, 9 (56%) were benign nodules (SUVmax: 2.59 to 11.59; average: 6.46; median: 6.27). No statistically significant difference was found between SUVmax of benign and malignant lesions (p=0.918, Mann-Whitney test). Conclusion: Our results showed that focal thyroid uptake in 68Ga-DOTANOC PET/CT was related to a high incidence of malignancy (44%), which suggests that these findings should always be reported and investigated. In our study, SUVmax was not a reliable mean to differentiate malignancy from a benign process, but a larger sample is needed to further validate this statement.