Neuroendocrine tumour of the mediastinum: fusion of ^{18}F -FDG and ^{68}Ga -DOTATOC PET/CT datasets demonstrates different degrees of differentiation

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The diagnostic value of ^{18}F -FDG PET is known to be limited in neuroendocrine malignancies because only poorly differentiated tumours demonstrate a markedly increased glucose metabolism [1]. ^{68}Ga -DOTATOC is a somatostatin analogue for highly sensitive and specific PET imaging of neuroendocrine tumours, with a high affinity for the human SSTR2 [2]. It shows promising results for the evaluation of patients with metastatic disease and the selection of patients scheduled for radionuclide therapy [3].

We present the case of a 59-year-old female patient with a recurrent neuroendocrine tumour of the mediastinum who was referred for the evaluation of radionuclide therapy with ^{90}Y -DOTATOC. Pretherapeutic imaging was performed using both ^{18}F -FDG PET/CT (a, c) and ^{68}Ga -DOTATOC PET/CT (b, d). The triple-fusion image (PET/PET/CT) of both datasets (e) demonstrates a high focal uptake of FDG in the central region of the tumour (red), indicative of partial dedifferentiation and increased proliferative activity. The peripheral rim-like uptake of DOTATOC (green) as well as the focal lesion close to the aortic arch indicate the better differentiated parts of the neuroendocrine tumour. The corresponding low-dose CT (e) additionally demonstrates bilateral pleural effusions and pulmonary infiltrations.

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