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Complementary role of ^{18}F-FDG and ^{68}Ga-DOTATATE PET/CT in the surveillance of patients with von Hippel-Lindau syndrome

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A 45-year-old woman with a history of von Hippel-Lindau (VHL) syndrome was evaluated during follow up with whole-body positron-emission tomography/computed tomography (PET/CT) scans post administration of ^{68}Ga-DOTATATE (targets cell surface overexpression of somatostatin receptors) (Fig. 1A,B) and ^{18}F-FDG (targets metabolic activity) (Fig. 1C,D) within two consecutive days. ^{68}Ga-DOTATATE was taken up by a cerebral hemangioblastoma (Fig. 1A) and revealed (Fig. 1A,B) 2 lesions in the head and the uncinate process of the pancreas; both were ^{18}F-FDG negative, indicative of well-differentiated neuroendocrine tumors (NETs). Additionally, ^{18}F-FDG revealed (Fig. 1C,D) a hypermetabolic tumor adjacent to the left adrenal gland, which was ^{68}Ga-DOTATATE-negative. This tumor was surgically resected and was proven to be an extra-adrenal paraganglioma. VHL is a highly penetrant, autosomal, dominantly inherited disorder associated with a germline mutation of the VHL tumor suppressor gene on the short arm of chromosome 3. It is characterized by the development of several benign and malignant tumors, including hemangioblastomas, pancreatic NETs, and paragangliomas [1]. ^{68}Ga-DOTATATE is a radiolabeled somatostatin analog suitable for PET imaging, that has emerged as the imaging standard of reference for the diagnosis of well-differentiated NETs [2,3]. Furthermore, hemangioblastomas, which are highly vascular benign tumors, are known to be ^{68}Ga-DOATATE-positive, as in the present case [2,4]. In addition, ^{18}F-FDG is the most widely used PET-tracer for oncologic purposes, as it can contribute significantly to the detection and follow up of various VHL-related tumors. The presented data highlights the complementary role of ^{68}Ga-DOTATATE and ^{18}F-FDG for the accurate diagnosis of uncertain lesions in the context of the surveillance for patients with VHL.

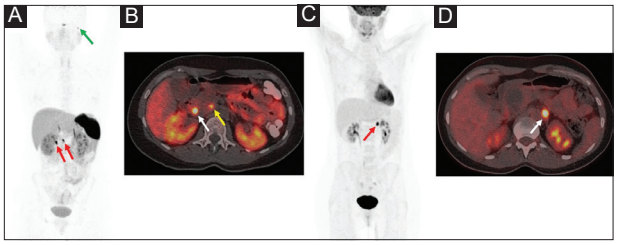

Figure 1 (A) Maximum intensity projection (MIP) ^{68}Ga-DOTATATE positron-emission tomography (PET) image of the head and torso, showing a focal lesion in the left cerebellum (green arrow), corresponding to a known hemangioblastoma, and 2 foci of abnormally increased radiotracer uptake in the abdomen (red arrows). (B) Axial fused ^{68}Ga-DOTATATE PET/CT image of the abdomen, showing (white arrow) a focal lesion in the pancreatic head (SUVmax: 41.7) and a second lesion (yellow arrow) in the uncinate process of the pancreas (SUVmax: 32.7), indicative of neuroendocrine tumors. (C) MIP ^{18}F-FDG PET image of the head and torso, showing a focal, intensely hypermetabolic lesion in the left upper abdomen (red arrow). (D) Axial fused ^{18}F-FDG PET/CT image of the abdomen, showing (white arrow) ^{18}F-FDG avid lesion (SUVmax: 20.3) located below the pancreatic tail, adjacent to the left adrenal gland. The patient underwent surgery for the mass adjacent to the left adrenal gland, and histology revealed extra-adrenal paraganglioma

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