Epididymal Cystadenomas in von Hippel-Lindau Disease Showing Increased Activity on ^{68}Ga DOTATATE PET/CT

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Abstract: von Hippel-Lindau (VHL) disease is a familial cancer syndrome characterized by the development of a variety of malignant and benign tumors, including epididymal cystadenomas. We report a case of a VHL patient with bilateral epididymal cystadenomas who was evaluated with ^{68}Ga DOTATATE PET/CT, showing intensely increased activity (SUV_{max}, 21.6) associated with the epididymal cystadenomas, indicating cell-surface overexpression of somatostatin receptors. The presented case supports the usefulness of somatostatin receptor imaging using ^{68}Ga DOTA-conjugated peptides for detection and follow-up of VHL manifestations, as well as surveillance of asymptomatic gene carriers.

Key Words: von Hippel-Lindau (VHL) disease, ^{68}Ga DOTATATE PET/CT, epididymal, cystadenomas, somatostatin receptors imaging

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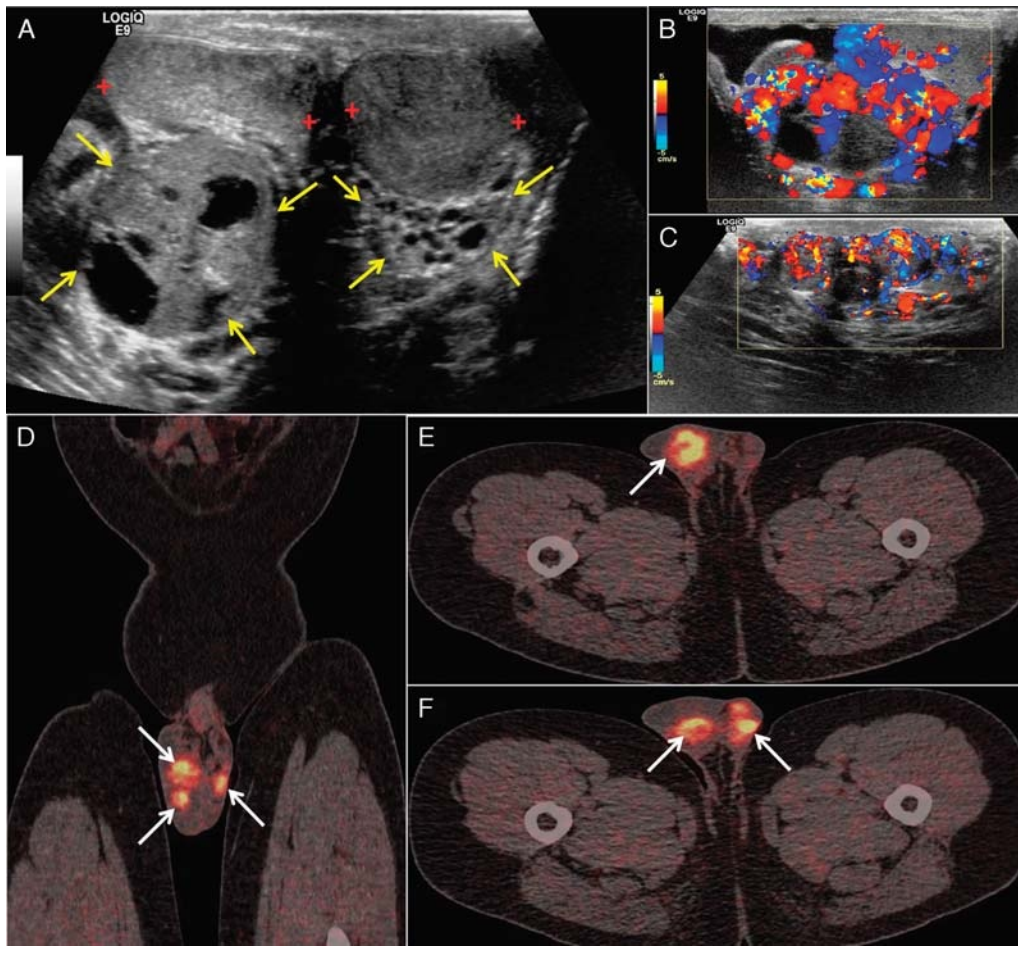

FIGURE 1. A 46-year-old man with known history of von Hippel-Lindau (VHL) disease underwent whole-body PET/CT scan using ^{68}Ga DOTATATE as part of his evaluation for the detection of neuroendocrine lesions. Consecutive ultrasound tests over a period of 4 years had shown bilateral lobulated extratesticular masses with mixed echotexture consisting of solid tissue and multiple small cystic spaces (**A**, yellow arrows) behind otherwise normal testes (**A**, red crosses), typical of bilateral epididymal cystadenomas. Vascularity of the cystadenomas was intense and elevated (Doppler ultrasound, transverse images of the right panel **B** and the left panel **C** epididymis). The ^{68}Ga DOTATATE PET/CT study showed intensely increased activity (SUV_{max}, 21.6) in the scrotum corresponding to the epididymal cystadenomas (**D**–**F**, coronal and axial PET/CT images of the scrotum, respectively). Von Hippel-Lindau disease is an autosomal dominantly inherited familial cancer syndrome with a prevalence of 1 in 39,000 to 53,000 associated with inactivation of a tumor suppression gene located on the short arm of chromosome 3 and characterized by the development of a variety of benign and malignant tumors.[1] Von Hippel-Lindau disease's spectrum of manifestations is broad with 40 different lesions in 14 different organs including retinal and central nervous system hemangioblastomas, endolymphatic sac tumors, renal cysts and tumors, pancreatic cysts and tumors, pheochromocytomas, as well as epididymal and broad ligament cystadenomas.[1,2] Papillary epididymal cystadenomas are rare benign tumors mainly occurring in young adult males, with one third of the cases reported in the literature to having occurred in VHL disease patients.[3] Cystadenomas of the epididymis are encountered as unilateral lesions in the general population, but when bilateral, they are virtually considered pathognomonic of VHL disease.[4] Although genetic testing for VHL syndrome is available, imaging with multiple modalities contributes to the early detection and follow-up of the various manifestations of this multisystem disorder, as well as to the screening and long-term surveillance of asymptomatic gene carriers. Because many VHL lesions such as hemangioblastomas or pancreatic neuroendocrine tumors are known to overexpress somatostatin receptors (SSTRs), they can be effectively targeted and localized using radiolabeled SST analogs.[5] The introduction of ^{68}Ga DOTA-conjugated peptides (SST analogs) into clinical practice allowed SSTR imaging with PET and is evolving as the new imaging standard of reference for the detection and characterization of neuroendocrine tumors and other SSTR-positive tumors,[6,7] with promising applications in VHL disease patients.[8–10] The presented case of a VHL disease patient with bilateral epididymal cystadenomas showing intensely increased activity on ^{68}Ga DOTATATE PET/CT suggests cell-surface overexpression of SSTRs by these tumors and particularly SSTR-2 for which ^{68}Ga DOTATATE has a predominant affinity. Considering the wide spectrum of VHL disease manifestations, the presented data support the usefulness of SSTR imaging with ^{68}Ga DOTA-conjugated peptides in diagnosing not only neuroendocrine lesions, but also various SSTR overexpressing tumors. Furthermore, the ability of ^{68}Ga DOTATATE PET/CT to directly demonstrate whole-body SSTR expression allows selection of VHL disease patients for hormonal therapy with cold octreotide or theranostic application of peptide receptor radionuclide therapy.