

⁶⁸Ga-FAPI PET/CT for diagnosing multifocal head-neck and liver paragangliomas

Abstract

This report presents a case of a 51-year-old woman who was admitted to our hospital with incomplete closure of the left eyelid and a crooked right corner of the mouth. She was diagnosed with multifocal head-neck and liver paragangliomas that were confirmed by pathological tests and gallium-68-fibroblast activation protein inhibitor (⁶⁸Ga-FAPI) positron emission tomography/computed tomography (PET/CT) imaging. The findings of this case suggest that ⁶⁸Ga-FAPI PET/CT may be a potential diagnostic tool for paragangliomas.

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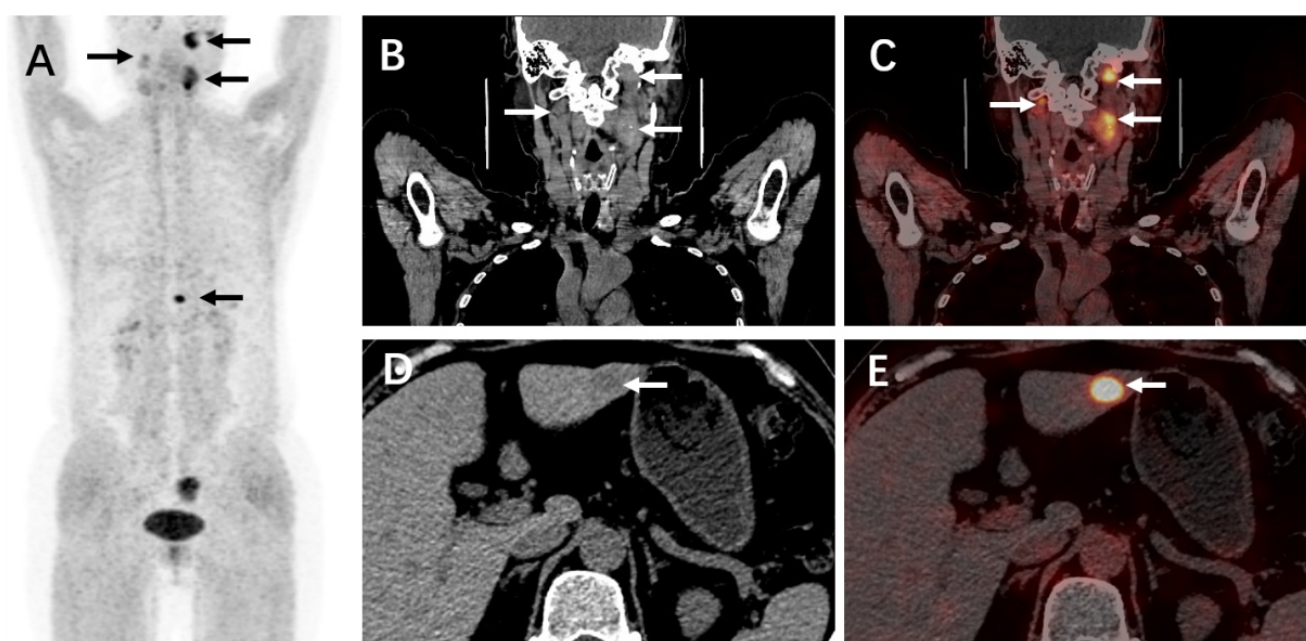


Figure 1. A 55-year-old woman was admitted to our hospital with incomplete closure of the left eyelid and crooked right corner of the mouth persisting for 7d. The catecholamine test results were negative. Enhanced computed tomography (CT) revealed soft tissue density nodules and mass in the left jugular foramen area (29×17mm), the bifurcation of the left common carotid artery (37×23mm), and the starting segment of the right internal carotid artery (18×16mm). All lesions exhibited significant enhancement and non-enhanced necrotic areas. A gallium-68-fibroblast activation protein inhibitor (⁶⁸Ga-FAPI) positron emission tomography (PET)/CT showed these three lesions with increased ⁶⁸Ga-FAPI uptake in the head and neck, as evident in the maximum intensity projection (MIP) image (A, black arrows in the head and neck), axial CT (B, white arrows) and PET/CT fusion imaging (C, white arrows) of the ⁶⁸Ga-FAPI PET/CT scan; the respective maximum standardized uptake values (SUVmax) values were 10.0, 9.7, and 4.4. These imaging techniques revealed a slightly low-density nodular with unclear boundaries and approximately 14×10mm in size (SUVmax: 10.3) (A, black arrow in the abdomen and D, E, white arrows). Subsequently, the patient underwent tumor resection surgery in the head, left neck, and liver; all tumors were pathologically confirmed as paragangliomas. Additionally, although the lesion on the right neck was not removed surgically, we suspected it was a paraganglioma, based on enhanced CT findings. Paragangliomas are pheochromocytomas located outside the adrenal gland, and are rare neuroendocrine tumors [1, 2]. The occurrence of multiple paragangliomas throughout the body is rare and is often associated with genetic mutations or inheritance [3]. Paragangliomas originating from the sympathetic nervous system are commonly found in the chest, abdominal, and pelvic cavities, and are often accompanied by an increase in catecholamines [4]. It is often discovered owing to symptoms such as paroxysmal hypertension, headache, palpitations, and sweating [5]. Paragangliomas originating from the parasympathetic nervous system are commonly found in the skull base and neck, and usually do not produce catecholamines. Therefore, they are rarely detected based on symptoms of catecholamine excess. Paragangliomas are usually revealed through the presence of neck masses or symptoms such as hearing loss, pulsatile tinnitus, dysphagia, and cerebral nerve paralysis caused by the compression or infiltration of adjacent structures [6, 7]. Primary paragangliomas of the liver are also relatively rare, with only approximately 13 cases reported so far [8]. Currently, previous literature suggests that single-photon emission CT/CT or PET/CT should be used to comprehensively evaluate the condition of patients with paragangliomas. Commonly used imaging agents include iodine-123 (¹²³I)-metaiodobenzylguanidine, fluorine-18-fluorodeoxyglucose (¹⁸F-FDG), 3,4-dihydroxy-6-[¹⁸F]fluoro-L-phenylalanine, ⁶⁸Ga-dodecanetetraacetic acid, and somatostatin assay [1, 2, 9-11]. Currently, ⁶⁸Ga-FAPI is less commonly used for neuroendocrine tumors, including paragangliomas [12]. In this case, ⁶⁸Ga-FAPI was used to comprehensively and accurately evaluate the patient's condition, highlighting the potential use of ⁶⁸Ga-FAPI as a promising imaging agent for neuroendocrine tumors.

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