^{18}F-FDG PET/CT image of invasive hemangioma in the lumbar vertebra

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Abstract

In the usual scenario, vertebral hemangiomas do not demonstrate heightened uptake above background on fluorine-18-fluorodeoxyglucose (^{18}F-FDG) positron emission tomography/computed tomography (PET/CT) scans. Here we presented a case of a positive ^{18}F-FDG PET/CT result indicating invasive vertebral hemangioma at the L2 vertebra, with atypical CT imaging features of heterogeneous increased density and multiple patchy density shadows. Our case underscores an additional uncommon aspect of invasive vertebral hemangioma imaging, warranting consideration in the differential diagnosis when encountering analogous findings on ^{18}F-FDG PET/CT.

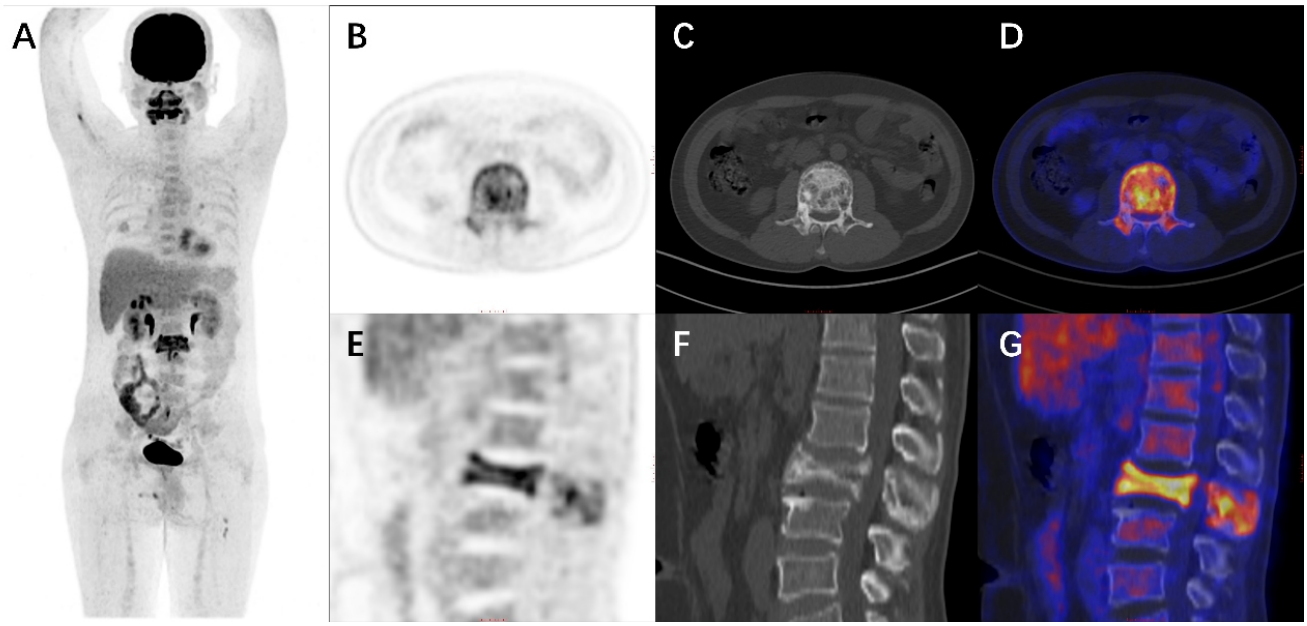

Figure 1. A 46-year-old male patient presented to our hospital with a three-month history of lumbar pain. Abdominal CT revealed flattening of the L2 vertebral body, heterogeneous increased density of the vertebral body and adjacent structures, multiple patchy density shadows within, significant narrowing of the corresponding vertebral canal, and compression of the spinal cord. Suspicion arose regarding a tumorous lesion, prompting further investigation with ^{18}F-FDG PET/CT for clarification. Maximum intensity projection (MIP) image (A), axial PET (B), CT (C), fusion image (D), and sagittal PET (E), CT (F), fusion image (G) demonstrated compression flattening of the L2 vertebral body, concavity of the upper and lower endplates, increased ^{18}F-FDG uptake in the L2 vertebral body and its adjacent structures, with a maximum standardized uptake value (SUVmax) of 12.48.

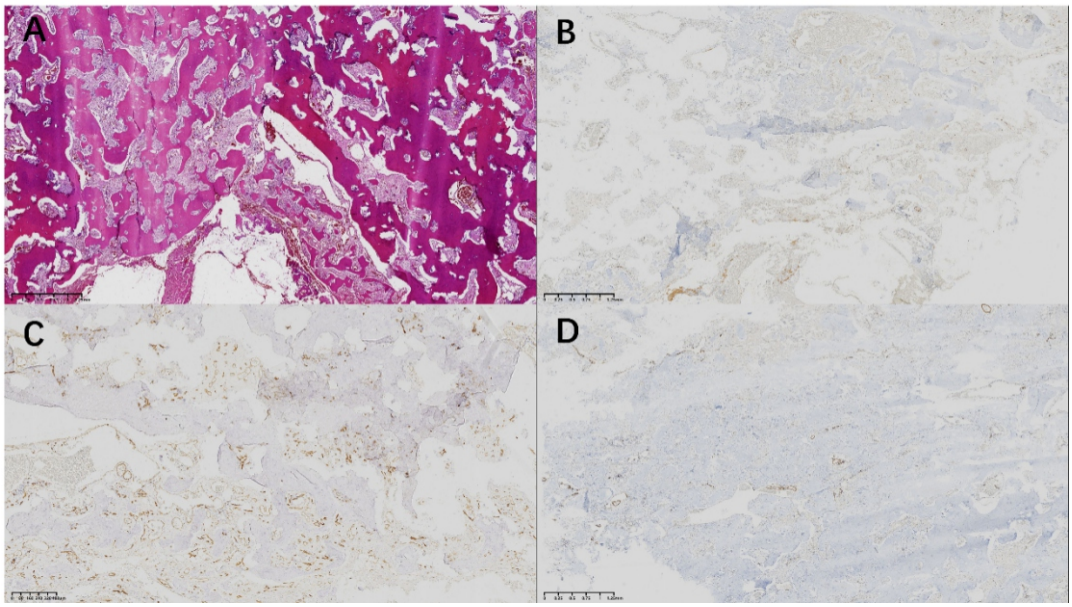

Figure 2. Subsequently, the patient underwent surgical resection. Hematoxylin and eosin (H&E) staining indicated vascular lesions (A), and immunohistochemical analysis revealed positive CD31 (B), CD34 (C), and perivascular smooth muscle actin (SMA) (D), which confirmed a diagnosis of vertebral hemangioma. Vertebral hemangioma is the most common benign vascular lesion of the spine, occurring in 1.9%-27% of the population. In rare instances, vertebral hemangiomas may manifest as extraosseous expansion, leading to compression of the spinal cord. These lesions are categorized as aggressive or atypical vertebral hemangiomas (AVH) and constitute less than 1% of spinal hemangiomas [1]. Typically, on ^{18}F-FDG PET/CT scans, hemangiomas exhibit no increased uptake above background [2]. However, there are few documented cases of high uptake in vertebral hemangiomas. Nakayama M reported a case of a 'hot' vertebra in ^{18}F-FDG PET due to vertebral hemangioma [3]. Solav SV also reported a case of ^{18}F-FDG PET/CT showing false-positive results for vertebral hemangioma [4]. However, in current cases with positive ^{18}F-FDG PET/CT findings, they are invariably accompanied by a typical corresponding mass lesion on CT, presenting as a 'polka dot appearance' on CT scan due to thickened trabeculae. In our case, the hemangioma demonstrated an invasive behavior, and the CT imaging characteristics were not typical of hemangioma. Similar imaging appearances should prompt consideration of differential diagnoses such as liposarcoma, osteoblastoma, and giant cell tumor of bone. Our case highlights another unusual characteristic of invasive vertebral hemangioma imaging, which should be considered in the differential diagnosis when encountering similar findings on ^{18}F-FDG PET/CT.

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