

A Rare Case of Pituitary Carcinoma With Bone Metastases

⁶⁸Ga-DOTATATE PET/CT Findings

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Abstract: Pituitary carcinomas are extremely rare and aggressive tumors that comprise only 0.2% of all pituitary tumors. Because of its rarity, pituitary carcinomas are difficult to diagnose. Conventional imaging methods are inadequate to detect metastatic lesions. Pituitary carcinomas are neuroendocrine tumors and express somatostatin receptors; therefore, ⁶⁸Ga-DOTATATE PET/CT may be used in the staging of these rare tumors. Herein, we present an exceptional case of pituitary carcinoma with sclerotic skeletal metastases showing ⁶⁸Ga-DOTATATE uptake.

Key Words: pituitary carcinoma, ⁶⁸Ga-DOTATATE, PET/CT, metastasis

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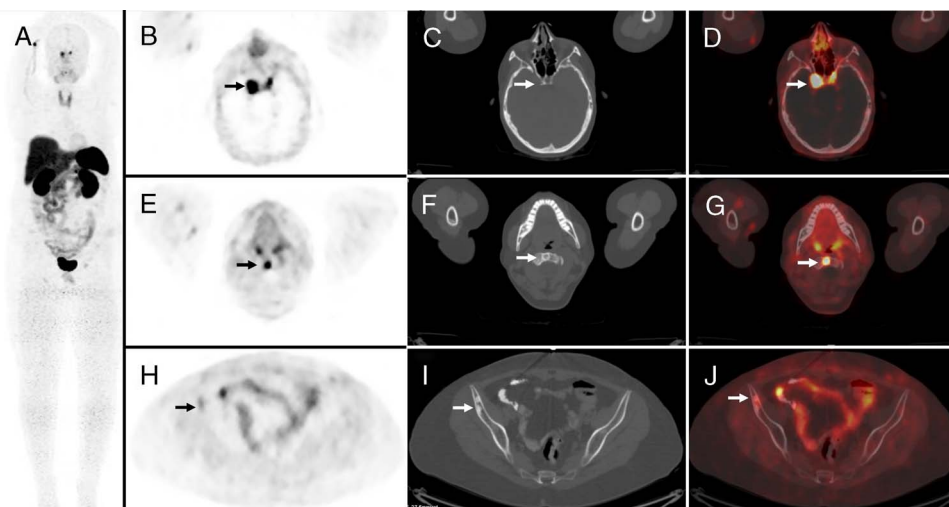


FIGURE 1. A 28-year-old woman diagnosed with adrenocorticotrophic hormone (ACTH)-secreting pituitary adenoma and treated with transsphenoidal resection 5 years ago was presented with complaints of headache and blurry vision. MRI showed a 2-cm diameter lesion filling the cavernous sinus in the right sellar area and a 7-mm diameter lesion in the left sellar area. ^{18}F -FDG PET/CT was performed to stage the disease. ^{18}F -FDG PET/CT did not show any evidence of local recurrence in the sellar area. ^{18}F -FDG PET/CT revealed multiple sclerotic lesions in the skeleton, but ^{18}F -FDG uptake was not observed in any of the lesions. The patient underwent ^{68}Ga -DOTATATE PET/CT to show the nature of the primary pituitary tumor and skeletal lesions. ^{68}Ga -DOTATATE PET/CT demonstrated intense ^{68}Ga -DOTATATE uptake in the sellar lesions (A, MIP image; B, PET image; C, CT image; D, PET/CT image). Moreover, ^{68}Ga -DOTATATE PET/CT revealed increased expression of somatostatin receptors in the skeletal lesions, which proves that these lesions were metastases of the pituitary tumor (arrows in E, PET image; F, CT image; G, PET/CT image; H, PET image; I, CT image; J, PET/CT image). Pituitary carcinomas are extremely rare tumors that account for only 0.2% of all pituitary neoplasms.¹ Pituitary carcinoma is described as a primary sellar tumor associated with aggressive intracranial lesions or metastasis to distant sites. Pituitary carcinoma is almost always diagnosed as a benign tumor in adults and requires a long time interval for progression to carcinoma. Ki-67 index, nuclear P53 expression, and mitotic figures have been used to determine tumor aggressiveness. However, none of these markers has been able to detect pituitary carcinoma at an early stage.² Pituitary carcinoma has a poor prognosis and shows rapid deterioration after the diagnosis, despite the urgent use of aggressive treatments.³ Brain MRI is not sufficient to diagnose pituitary carcinomas; therefore, the whole body must be examined to detect metastases. ^{68}Ga -DOTATATE PET/CT may become an alternative modality for screening pituitary carcinoma. ^{68}Ga -DOTATATE is a selective somatostatin analog with increased affinity for somatostatin receptor subtype 2 and has been routinely used for imaging neuroendocrine tumors.⁴ Pituitary adenomas express high somatostatin receptors and are well known to show high ^{68}Ga DOTATATE uptake. However, due to the rarity of pituitary carcinomas, there have been limited cases that show ^{68}Ga -DOTATATE uptake in these tumors.^{5–8} Furthermore, sclerotic skeletal metastasis showing ^{68}Ga -DOTATATE uptake has not been reported before. This unique case highlights the usefulness of ^{68}Ga -DOTATATE PET/CT in detecting metastasis of pituitary carcinoma, which is difficult to diagnose by conventional imaging methods.