



Positive [^{18}F]fluoroethyltyrosine PET/MRI in suspected recurrence of growth hormone–producing pituitary adenoma in a paediatric patient

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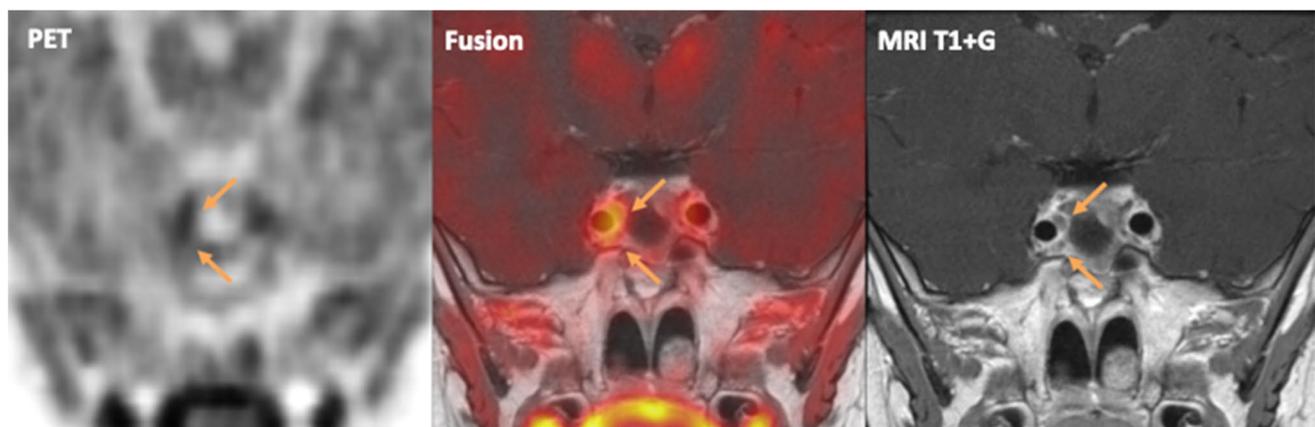
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A 6-year-old boy was referred because of a suspected recurrence of a growth hormone (GH)–producing pituitary macro-adenoma, which initially expanded from the sella turcica to the suprasellar and right parasellar region. Over the course of 2.5 years, the patient had undergone three transphenoidal resections after which biochemical values normalized. At time of referral, the patient again experienced symptoms of localized headache and increasing GH and IGF-1 serum levels. Repeated MRIs were obtained under a dedicated pituitary imaging protocol, but paediatric neuroradiologists were unable to conclusively differentiate between recurring adenoma and post-operative granulation tissue.

As one report of the incidental finding of a macro-adenoma on 18F-fluoroethyl-L-tyrosine ([^{18}F]FET) PET has been described [1], we decided to perform a [^{18}F]FET PET/MRI in

our patient, in an attempt to confirm the suspected recurrence. [^{18}F]FET is a non-natural amino acid transported by the amino acid transport system L (LAT), of which particularly the LAT1 isoform is expressed in a variety of tumour cells. A recent study in rat showed higher LAT1 gene levels in GH-producing pituitary tumour cells compared to normal pituitary tissue [2].

In our case, PET/MR-images revealed increased [^{18}F]FET uptake caudomedially of the right internal carotid artery (Fig. 1A/B). The uptake correlated with two nodular lesions of approximately 3 and 5 mm diameter (Fig. 1C), which were indeed progressive in size over time. This confirmed recurrent adenoma foci, and establishes the usability of [^{18}F]FET PET/MRI for imaging of pituitary adenoma. Our patient was referred for radiotherapy, since a fourth resection was not considered possible.



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Declarations

Ethics approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants (in this case, the parents of the patient) included in the study.

Conflict of interest The authors declare no competing interests.

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