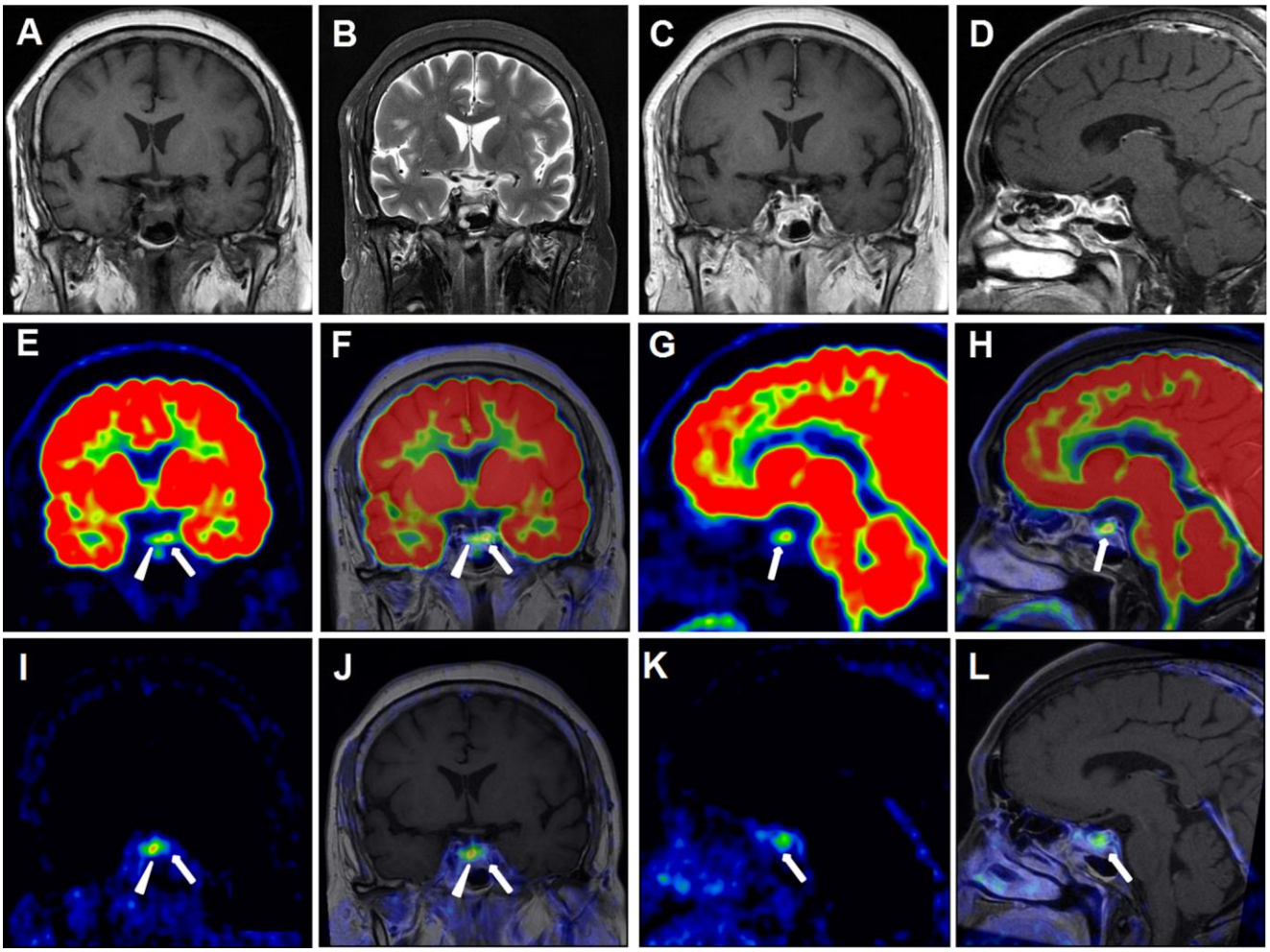
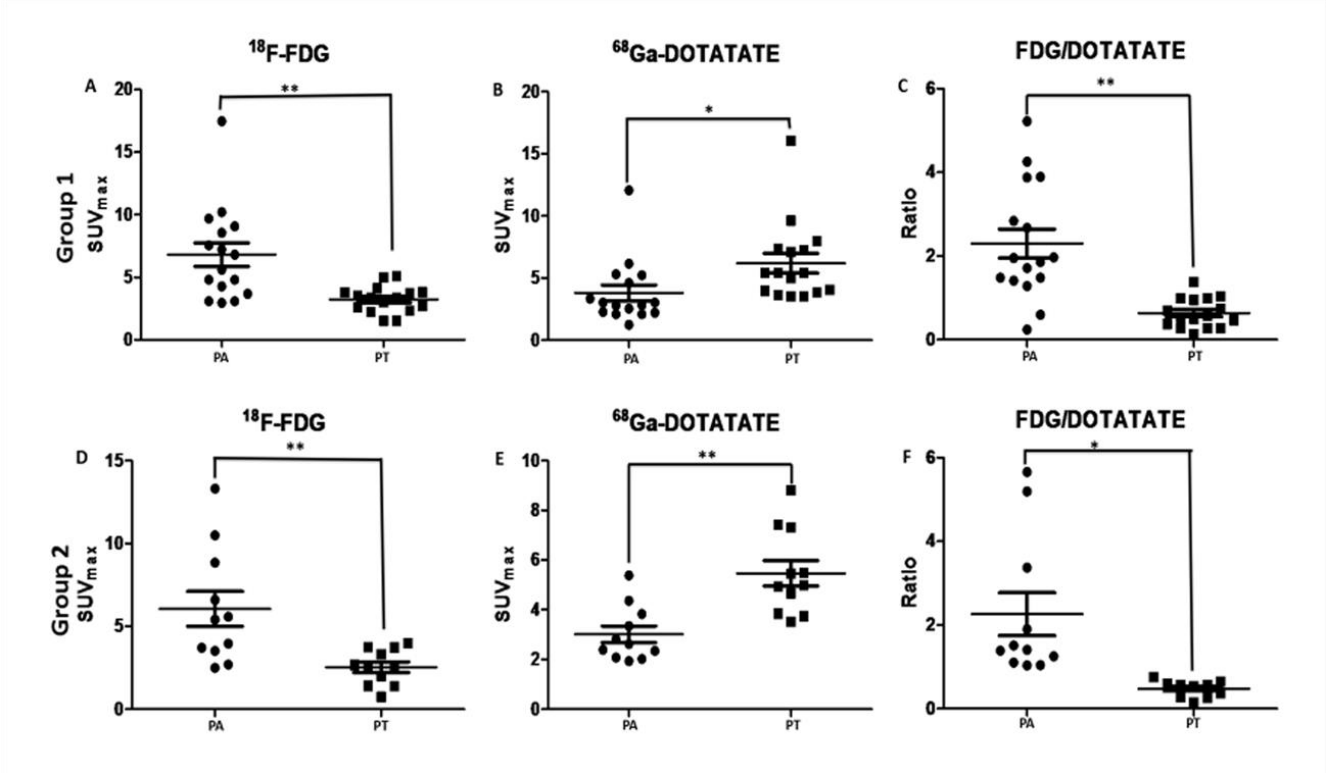


Supplemental Fig. 1 MRI and ^{18}F-FDG/^{68}Ga-DOTATATE PET/MR images of a 50-year-old woman with elevated ACTH levels 3 months after removal of an ACTH-secreting pituitary adenoma (patient No. 25 in Table 1). The MRI images showed only post-surgery changes (A-D: T1 coronal, T2 coronal, enhanced T1 coronal and sagittal views). The PET/MR images clearly showed an ^{18}F-FDG avid lesion (arrow) at the left side of the sella turcica (E-H: coronal view, coronal fusion, sagittal view and sagittal fusion), with lower ^{68}Ga-DOTATATE uptake than the remain pituitary tissue at the center region (triangle) (I-L: coronal view, coronal fusion, sagittal view and sagittal fusion). The follow-up surgery confirmed a left side recurrent functional pituitary adenoma ($4 \times 3 \times 3$ mm^3) with positive ACTH stain



Supplemental Fig. 2 Comparison of ^{18}F-FDG (A, D) and ^{68}Ga-DOTATATE(B, E) uptake levels, and ^{18}F-FDG over ^{68}Ga-DOTATATE uptake ratio (C, F) between pituitary adenoma and pituitary tissue. Group 1: Undiagnosable primary pituitary adenoma patients (n = 16); Group 2: Recurrent pituitary adenoma patients (n = 11). PA: pituitary adenoma; PT: pituitary tissue; *: $P < 0.05$; **:$P < 0.01$