



## DOTATATE PET Imaging for Stereotactic Radiosurgery Treatment Planning of Radiographically Occult Pituitary Adenoma: Case Report

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**Objectives:** Pituitary adenomas are traditionally identified by structural imaging with high sensitivity dedicated pituitary sequences, and radiosurgery treatment is planned using these same scans. However, in select cases, identification of the residual pituitary adenoma can be difficult based on MRI alone. We present a case of recurrent ACTH secreting pituitary adenoma in which DOTATATE PET was successfully used for corollary lesion identification and radiosurgery planning.

**Methods:** A 36-year-old female, previously diagnosed with Cushing disease in 2015 due to ACTH-secreting pituitary adenoma, who underwent surgical resection with presumably a gross total resection, presented due to recurrence of Cushing disease in 2023. The patient underwent serial MRIs which failed to identify any mass lesion and in 2025 she underwent an exploratory surgical re-resection which was pathologically negative. Due to the inability of traditional structural imaging to identify presumed adenoma recurrence, we utilized DOTATATE PET for tumor localization. Tumor margins were delineated using DOTATATE PET/CT-MRI fusion. Contours were preferentially defined as PET-avidity borders of SUV threshold 25-100%. Radiotherapy treatment planning was performed on Leksell Gamma Knife Icon system.

**Results:** DOTATATE PET was able to clearly identify the presence of an ectopic avid lesion within the right cavernous sinus. MRI corollary was confirmed. By defining the margins of recurrence using differential DOTATATE PET avidity, we were able to limit total treatment field size and as well as limit pituitary and collateral cavernous sinus doses during treatment planning.

**Conclusion(s):** This report identifies a case in which DOTATATE-PET was successfully used to assist in the localization of a corollary structural lesion when tumoral recurrence was suspected but radiographically occult.

