

Evaluation of Uncinate Process Uptake on DOTA-TOC PET/MRI

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Background: Physiologic uptake in the uncinata process is a common finding when imaging patients with neuroendocrine tumors using somatostatin receptor PET imaging. PET/MRI is a new simultaneous imaging modality that allows for the acquisition of PET and MRI data in the same imaging session. We set forth to evaluate the utility of PET/MRI for the characterization of uncinata process uptake seen on PET.

Methods: 30 consecutive patients imaged using DOTA-TOC PET/MRI we included for evaluation. Patients were injected with an average of 5.4 mCi of Gallium-68 DOTA-TOC and imaged 113 after injection. All imaging was acquired using a gadolinium containing hepatobiliary contrast agent (gadoksetate disodium, Eovist). Images were retrospectively reviewed and compared to additional comparison imaging studies. Uptake was characterized as either being focal or diffuse. SUVmax values were calculated when uptake was noted.

Results: 21 of the 30 patients imaged demonstrated uptake in the uncinata process, with 13 of the 21 patients demonstrating focal uptake. In 20 of the 21 patients, a confident imaging interpretation could be made when comparing to additional studies, and 10 patients were determined to have physiologic uptake, 7 to have nodal disease and 3 to have pancreatic masses. The average SUVmax in negative patients was 15.5, while in patients with disease, the average was 27.9. Diffusion weighted imaging was negative in two patients with pathologic uptake, but was positive in the remaining 8 patients.

Conclusion: Preliminary analysis of DOTA-TOC PET/MRI suggests that MRI imaging can be used to adequately distinguish physiologic uptake for pathologic uptake in the uncinata process. Understanding the role of cross sectional imaging in characterizing uptake is important, given that this is a common finding in patients being imaged using somatostatin receptor PET.