O2

^{68}Ga-DOTATATE PET/CT Imaging for Advanced Neuroendocrine Carcinoma in the United States

Eric H. Liu, Jeff Clanton, Dominique Delbeke, Martin Sandler, Bill Martin, Ronald C. Walker

Background: Imaging of neuroendocrine malignancies in the United States has mostly relied on traditional cross-sectional and ^{111}In-octreotide SPECT imaging. However, internationally, ^{68}Ga-DOTATATE PET/CT is replacing these techniques with improved sensitivity and resolution. A new clinical trial of ^{68}Ga-DOTATATE PET/CT scanning is open to test the safety of the agent and compares its sensitivity /specificity to other imaging modalities (ClinicalTrials.gov identifier: NCT01396382).

Methods: This study is performed under an FDA approved IND. Patients greater than 18 years old with advance neuroendocrine malignancy or syndrome are eligible for the study. Subjects undergo routine evaluation and basic laboratory studies, EKG, and vital signs are taken before/after the scan. Triple phase CT scan will also be performed in conjunction with the PET scan. All patients will be injected with ^{68}Ga-DOTATATE and whole body imaging performed about 45 minutes post injection. A handful of patients with known metastatic NET will undergo dynamic scanning at one bed position to include the tumor. The scans will be evaluated by two independent nuclear medicine physicians. Discrepant results will be evaluated by a third physician. Treatment decisions will be made based on these images. We compare standard images with the ^{68}Ga PET/CT and determine if changes in medical decision making result from the new results.

Results: Two patients have been scanned with advanced neuroendocrine carcinoma. Patient #1 is a 60 y/o woman with three masses and liver cysts on CT scan and a history of neuroendocrine hepatic metastases. She underwent ^{68}Ga-DOTATATE scanning and a total of nine lesions were discovered. The cystic lesions were also neuroendocrine metastases. The second patient is a 64 y/o woman with

known metastatic midgut carcinoid who underwent peptide receptor radiotherapy. She underwent ^{68}Ga-DOTATATE scanning and all her lesions were deemed stable. Neither case had complications from the PET scan or significant changes in the vital signs or blood tests.

Conclusions: ^{68}Ga-DOTATATE PET/CT is an emerging imaging technique for neuroendocrine carcinoma, but more safety data must be collected in the United States for broader availability. Large multicenter trials will be necessary to determine if it affects treatment planning and overall survival.