

C-20

64Cu-DOTATATE Somatostatin Receptor Imaging in Neuroendocrine Tumor Patients: Experience from More Than 600 Patients

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BACKGROUND: We introduced 64Cu-DOTATATE in 2009. The potential benefits compared to 68Ga-labeled tracers include better spatial image resolution and longer half-life of 64Cu (13h) making logistics easier, in particular in high-throughput centers. Here we present our experience of with 64Cu-DOTATATE in >600 neuroendocrine tumor patients.

METHODS: Description of performance and practical workflow based on the first 600 patients.

The PET tracer 64Cu-DOTATATE is produced in batches for up to ten patient doses. These batches are released in the morning and the product has an approved shelf life of 24h. Accordingly, for practical purposes the patients may be scanned during the day and evening on the day of tracer production. Due to the long half-life, patients showing up late are no longer a major concern with regard to PET tracer use. Compared to 68Ga-labeled tracers, which we used previously and that typically were produced for 1-2 patients at a time, we have freed up substantial radiochemist time at our department. Imaging with 64Cu-DOTATATE is typically performed 1h after injection of approximately 200 MBq of 64Cu-DOTATATE but head-to-head comparison has demonstrated that that image acquisition may be performed any time between 1 and 3h post injection. With regard to diagnostic performance, we have undertaken head-to-head comparison studies with 111In-DTPA-octreotide and 68Ga-DOTATOC, respectively. Lesion detection rate of 64Cu-DOTATATE was superior to both

¹¹¹In-DTPA-octreotide and ⁶⁸Ga-DOTATOC. Sensitivity and specificity calculated on basis of the first 112 patients when using a composite standard of truth (CT only, follow up on imaging/biopsy) were 97% (CI: 91-99%) and 100% (CI: 96-100%), respectively. Following PET/CT scans of 600 patients with ⁶⁴Cu-DOTATATE , we have so far observed no major side-effects.

CONCLUSION: ⁶⁴Cu-DOTATATE is a sensitive and logistically convenient somatostatin receptor imaging PET tracer for routine use in neuroendocrine tumors patients.