Physiological Uptake in the Pancreatic Head on SRS Using 111In-DTPA-octreotide; Incidence and Mechanism

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Background: Physiological uptake in the uncinate process or pancreatic head has been described with Gallium-68 labeled PET tracers for somatostatin receptor imaging. 111In-DTPA-octreotide is the only registered radiopharmaceutical for the imaging of neuroendocrine tumors. We studied the uptake in this region of the pancreatic head on somatostatin receptor scintigraphy (SRS) using 111In-DTPA-octreotide in a large group of patients.

Methods: 407 patients underwent SRS using 111In-DTPA-octreotide in our department in 2014. After excluding patients with a known malignancy in or close to the pancreas, as well as all scans without SPECT/CT of the upper abdomen, we reviewed 178 scans in total. The uptake was graded on a 4-point scale that correlates the uptake in the pancreatic head to physiological uptake in the liver.

Results: Uptake in the region of the pancreatic head, including the uncinate process, was seen in 46/178 patients (26%) on SPECT-CT and in 12 patients (7%) on planar imaging. On SPECT/CT uptake was lower than the liver in 26 patients (15%), equal to the liver in 17 patients (10%) and higher than the liver in three patients (2%). In patients with diabetes mellitus the incidence of uptake in the pancreatic head was 50% on SPECT/CT.

Conclusion: Physiological uptake in the pancreatic head is seen on SPECT/CT with 111In-DTPA-octreotide in 26% of patients and the incidence is doubled in patients with diabetes mellitus. Previous case reports showed uptake in the pancreatic head due to histologically proven pancreatic polypeptide (PP) cell hyperplasia. Also, patients with DM have elevated serum PP concentrations, which is likely due to PP-cell hyperplasia. Since 90% of PP-cells are present in the pancreatic head, PP-cell hyperplasia is the most likely explanation for visualization of the pancreatic head on SRS in a substantial number of patients.

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