Abstract.—A patient with suspicion of a neuroendocrine tumor of the pancreas underwent a somatostatin receptor scintigraphy using 111In-Pentetreotide. 111In-pentetreotide scintigraphy showed discrete uptake of the radiotracer in the head of the pancreas and focal uptake in the right upper thyroid lobe. Tracer uptake in the 24h planar image was higher compared to the 4h image, and decreased after 48 hours. Normal thyroid tissue and thyroid disorders, such as cancers, Hashimoto’s thyroiditis, and adenomas often show increased uptake of 111In-pentetreotide resulting in a possible false positive interpretation in patients with neuroendocrine tumor. Adding a 48h planar image might contribute to the differential diagnosis between benign or malignant lesions, as in the present case where the uptake decreased in an adenoma after 48 hours.

KEY WORDS: 111In-Pentetreotide, thyroid adenoma.

INTRODUCTION

111In-pentetreotide is used for the evaluation and therapy planning of somatostatin receptor positive neuroendocrine tumors and their metastases. In thyroid benign disorders, such as Grave’s disease and ophthalmopathy, Hashimoto and De Quervain thyroiditis, nodular goiter, toxic adenoma as well as malignant tumors, such as papillary, follicular, anaplastic, and medullary thyroid carcinoma, and non-functioning metastases of differentiated thyroid carcinoma uptake of 111 In-pentetreotide was observed1-3. Recently, 111In-pentetreotide accumulation in a thyroid gland mimicking a metastasis of a previously operated, renal-cell carcinoma in a patient with multiple endocrinological neoplasm was published4. 111In-pentetreotide uptake was observed in normal functioning colloidal thyroid nodules, multinodular, nodular, colloidal nodule with chronic thyroiditis, cellular colloid nodule, and in endemic goiter1,2,5-7. Accumulation of 111In-pentetreotide in various tissues and organs such as pituitary gland, spleen, liver, kidney and urinary bladder, in colon, sarcoidosis, tuberculosis, ventral hernia, parapelvic renal cyst, granuloma etc. was also reported1,5-7.

CASE REPORT

A 54 year-old men with the suspicion of a neuroendocrine tumor of the pancreas was referred to the Department of Nuclear Medicine. The patient underwent a somatostatin receptor scintigraphy after injection of 200MBq of 111In-Pentetreotide. Four and 24 hour post injection thoracic and abdominal planar images and a Single Photon Emission Computed Tomography (SPECT) study were acquired. 111In-pentetreotide scintigraphy showed discrete uptake of the radiotracer in the head of the pancreas (fig. 1) and focal uptake in
the right upper thyroid lobe (fig. 2). $^{111}$In-pentetreotide uptake in the 24h planar image was higher compared to the 4h image, and decreased after 48 hours. Thyroid ultrasonography revealed a 27 × 14 × 18 mm sized iso-echoic homogenous thyroid lesion of the right thyroid lobe with good vascularization in the Duplex scan, and a second, echopenic nodule with a diameter of 5 mm located below this lesion (fig. 3). On $^{99m}$Tc-pertechnetate scintigraphy (fig. 4), the lesion was a cold lesion suggesting a possible malignant tumor suggestive for a metastasis of the neuroendocrine tumor. The patients thyroid hormone tests were normal. The tumor was removed surgically. The histopathological diagnosis was a thyroglobulin-positive follicular thyroid adenoma. The lesion was negative for serotonin or chromogranin A.
ve uptake of 111In-pentetreotide in pulmonary metastases because of Hürthle cell carcinoma, they found positive uptake of 111In-pentetreotide in our case with follicular adenoma. Adding a 48h planar image might contribute to the differential diagnosis of benign or malignant lesion, as in the present adenoma the uptake decreased after 48 hours.

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REFERENCES


The somatostatin receptor subtypes SSTR2—which has the highest affinity to octreotide—SSTR3 and SSTR5 are the target receptors for octreotide. Since the follicular thyroid cells express mainly SSTR3, and SSTR5 subtypes, it may be concluded that these two subtypes are responsible for the uptake of 111In-pentetreotide in our case with follicular adenoma.


