ORIGINAL ARTICLE

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Biodistribution on Tc-99m labeled somatostatin receptor-binding peptide (Depreotide, NeoTec) planar and SPECT studies

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Purpose: To determine the biodistribution of Tc-99m labeled somatostatin receptor-binding peptide (Depreotide) on planar and SPECT studies of the thorax and upper abdomen in order to improve diagnostic accuracy. ***Methods and Materials:*** Retrospectively 29 planar and SPECT studies from 28 patients (all males, average age of 65.79) were reviewed. All the patients had been referred for evaluation of solitary pulmonary nodules. Two to four hours after IV injection of 555- to 740-MBq (15–20 mCi) Tc-99m Depreotide, anterior and posterior total body images, and anterior, posterior, right lateral and left lateral planar images were obtained, and thoracic SPECT was acquired with a three-head gamma camera. The degree of uptake in the lungs, thoracic cage, and organs of the upper abdomen was rated from "0" to "++++". ***Results:*** The range of normal activity in the thorax includes cardiac, "0"; pulmonary, "+"; rib, "+/++"; sternum, "++"; vertebrae, "++". The degree of normal activity seen in the upper abdominal organs includes liver and spleen, "+++", and kidneys, "+++/++++". Eight patients with emphysema had diffuse pulmonary uptake graded as "+/++". One patient with left pneumonectomy and radiation therapy to the left hemithorax had photon-deficiency in the left hemithorax and decreased to absent uptake including the vertebrae and ribs. Although some cases had background pulmonary uptake of Tc-99m Depreotide, the bone/bone marrow activity of the thoracic cage including the ribs, sternum, and thoracic spine is sufficiently great enough to produce a clear distinction between bone and lung in the thoracic cavity that gives high-contrast resolution on SPECT. ***Conclusions:*** The intensity of radioactivity in the sub-diaphragmatic organs such as the liver, spleen, and kidneys provides useful guidance for the categorization of pulmonary lesions. The uptake of land marks such as the sternum, which is anteriorly located, and the thoracic vertebrae, which are posteriorly located in the thoracic cage, can be used in the localization of a Depreotide avid tumor.

Key words: Tc-99m Depreotide, planar images, SPECT, liver uptake, lung uptake, spleen uptake, renal uptake