Calculated values for T 1/2 in downward time-activity curves were displayed in another images with appropriate background cut off. Malignant thyroid tumors with vascularity were displayed as hot areas, while benign tumors were not displayed on the images either by cut off or in the absense of downward slope.

This functional image is of special value for daily clinical studies on thyroid function as well as thyroid nodule because this method does not need standard measurement, requires data processing time of only 10 minutes including calculation time of 2 minutes, can be performed along with usual ^{99m}Tc-pertechnetate scintigraphy.

Comparison of Thyroid Images with I-123 and Tc-99m

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Though thyorid imaging has been performed with various nuclides, I-123 and Tc-99m are more suitable, because of their smaller radiation dose to the thyroid and more suitable photon energies than the others. Since I-123 has become available in this country, we studied the clinical usefulness of I-123 and compared thyroid images obtained with I-123 and Tc-99m.

Forty three cases of various thyroid diseases (solitary nodule 23, diffuse goiter 16, postoperative remnant 4) were examined with I-123. At 8 hours after the oral administration of 100–200 μCi of I-123, images of thyroid gland were obtained on the gamma camera equipped with a pinhole collimator. In 38 out of 43 patients, Tc-99m images were taken at 30–60 minutes after the intravenous injection of 1–2 mCi of Tc-99m o n the previous day.

In 42 of 43 cases examined with I-123, excellent images were obtained. In 38 cases in which I-123 and Tc-99m images were compared, both images were poor in 1, equally excellent in 26, and I-123 image was better than that of Tc-99m in 11 patients, respectively. The detail of the last group was as follows. In 3 cases, Tc-99m uptake was insufficient for a clear image. In 6 cases, the high background detracted from the sharpness of detail. In 2 cases small nonfunctioning nodules were more clearly seen on the I-123 image than with Tc-99m.

Two patients with chronic lymphocytic thyroiditis showed discordant image between 2 scintigrams, that was a focal area which accumulated the same Tc-99m as, and less I-123 than, the other area. The histology of the lobe which was resected in one of them, was consistent with chronic lymphocytic thyroiditis and the section showing the discrepancy of Tc-99m and I-123 images did not show any characteristic feature different from the rest of gland. Such a discrepancy between 2 images has been reported in the cases of adenomatous goiter, thyroid adenoma and carcinoma. No case of chronic lymphocytic thyroiditis has been known to our knowledge that showed the discrepancy.

RI Diagnosis of Thyroid Tumor (Report III) Study of $^{197}HgCl_2$ Uptake into Thyroid Tumor

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Previously, we reported clinical application of thyroid tumor scanning with $^{197}HgCl_2$, which was a valuable diagnostic method for the detection of thyroid carcinoma. Then, we investigated uptake of $^{197}HgCl_2$ into thyroid tumor and found that the uptake of $^{197}HgCl_2$ in thyroid carcinoma