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RETROSPECTIVE EVALUATION OF Tc-99m AND Tl-201 COMBINED THYROID SCINTIGRAPHY IN A NODULAR GOITER.

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Tc-99m and Tl-201 scintigraphy has been performed in 360 patients suspected of a nodular goiter since 1981. 89 cold nodules in 83 patients has been histologically proved by surgery. Initial thyroid imaging was performed 15 minutes after the injection of 2 mCi of Tl-201. In 3 hours later, thyroid image with Tl-201 which was followed 15 minutes after the administration of 5 mCi of Tc-99m-pertechnetate was taken again. Initial image with Tl-201 chloride could appear to be helpful to see nodular characteristics such as solid or cystic. Delayed thyroid images with Tl-201 were classified to three categories depending on degree of the radioactivity in the nodules for further evaluation. Tl-201 of delayed image was completely disappeared in 20%(8/40) with malignant nodules and in 53%(22/41) with benign ones. Equivocal radioactivity was seen in 13%(5/40) with malignant and 17%(7/41) with benign. Nodular appearance was clearly demonstrated in 68%(27/40) with malignant and in 29%(12/41).

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EVALUATION OF THYROID FUNCTION TESTING WITH Tc-99m-PERTECHNETATE THYROID UPTAKE, 20'/5' UPTAKE RATIO AND THYROID/SHOULDER RATIO. A. Nakashima, K. Yamada, T. Fujisawa, M. Mutsukura, Y. Katoh, T. Sugahara, H. Maeda, T. Funakoshi, R. Haruta, T. Fukushima and A. Ashizawa. Oita Medical College, Oita.

The usefulness of Tc-99m-pertechnetate for evaluation of thyroid disease was studied, using 133 subjects showed homogenous radioactivities of thyroid on Tc-99m scintigram.

After intravenous injection of 3 mCi Tc-99m-pertechnetate, the data collected on MT in 1 frame/20sec. from 0 to 30 min. So we set up ROIs, which were thyroid and shoulder for back ground on CRT respectively, and calculated thyroid uptake of Tc-99m and thyroid/shoulder ratio per 1 pixel at 20 min. after injection, and 20'/5' thyroid uptake ratio.

Next we classified them into 4 groups: 1) Euthyroid (18.8%), 2) Hyperthyroidism (34.6%), 3) Hypothyroidism (19.5%), 4) Chronic thyroiditis (27.1%). Group 1); Tc-99m thyroid uptake was 1.737 ± 0.918 , 20'/5' thyroid uptake ratio was 1.214 ± 0.210 , and thyroid/shoulder ratio was 5.266 ± 2.563 . Group 2); These parameters were increased. Group 3); Conversely those were decreased. Group 4); 47.2% of this group had low levels of T-4, whose thyroid uptake and uptake ratio were increased, but the others had normal levels of T-4, whose parameters were decreased.

The procedure provides a convenient method for evaluation of thyroid function as an accompaniment to Tc-99m thyroid imaging.

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METHOD FOR MEASUREMENT OF THYROID WEIGHT AFTER RADIOIODINE TREATMENT AND RELATION BETWEEN THYROID WEIGHT AND THE THERAPEUTIC EFFECT. T. Miyamoto, A. Ishihara, H. Nagashima, Y. Kondou, H. Komaki, K. Sato, Y. Takahashi and S. Hamada. Tenri Hospital, Radioisotope Division and Department of Endocrinology, 200 Mishima, Tenri City 632.

We devised a new method to estimate thyroid weight in hyperthyroid patients given therapeutic doses of I-131 and examined the relation between decrease in thyroid weight 3 to 5 weeks after administration of I-131 and the therapeutic effect. Validity of the new method was verified by phantom studies and also by the estimate using I-123 which had been shown to be in good agreement with the weight excised on operation. In the present series 60 patients were treated with I-131 ranging from 85 to $150 \mu\text{Ci/g}$ ($102 \pm 15.8 \mu\text{Ci/g}$), and the therapeutic effect was estimated regarding the function and weight of thyroid 6 months to 2 years after the administration. The doses of administered I-131 were overlapped between cured, hypothyroid, effective and slightly effective groups, and therefore it was not possible to predict the therapeutic effect on the basis of administered doses. Thyroid weight decreases more rapidly in hypothyroid group and more slowly in less effective and effective groups than in cured group, and reached less than 20g in cured and hypothyroid groups at 5 weeks.

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EVALUATION OF A SENSITIVE TSH RADIOIMMUNO-ASSAY USING MONOCLONAL ANTIBODIES.

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The high sensitive immunoradiometric assay kit of TSH using monoclonal antibodies was evaluated. The sensitivity of the assay was 0.1 uU/ml and no cross-reactivity with LH or FSH was observed up to 500 mU/ml but slight interference with hCG was observed in 5000 mU/ml. Sera with 320 uU/ml TSH was diluted with TSH 0 sera. Good linearity was achieved up to 640 folds dilution. Intra- and inter-assay C.V. were less than 10%. The TSH concentration ranged 0.2 to 9.0 uU/ml in 40 normal controls, while in all 26 untreated patients with Graves' disease it was less than 0.1 uU/ml. It ranged 0.3 to 3.4 and less than 0.1 to 5.9 uU/ml in the 8 and 17 patients with Graves' disease in remission and with euthyroid Graves' disease, respectively. The TSH concentration was correlated well with the values measured in the conventional TSH-radioimmunoassay kit ($r=0.942$, $n=135$, $p<0.001$) and with the TSH response to TRH ($r=0.906$, $n=60$, $p<0.001$). The TSH concentration was detectable in all 11 patients who had TRH responsiveness among 25 cases in which TSH was undetectable in the conventional kits.

The high sensitive TSH assay kit was useful for the diagnosis and treatment of the patients with Graves' disease.