RI Diagnosis of Thyroid Tumor (Report II)
Study of $^{197}Hgcl_2$ Uptake into Thyroid Tumor

N. KAWAMURA, M. MIYAKAWA, M. MAKIUCHI, R. FURIHATA
Department of Surgery, Faculty of Medicine, Shinshu University

Last year, we have already reported clinical application of thyroid tumor scanning with $^{197}Hgcl_2$, which is a valuable diagnostic method for the detection of thyroid cancer. However, in case of small sized or cystic degenerative thyroid cancer, we found that positive delineation was not obtained in ^{197}Hg scanning.

Therefore, in order to investigate uptake of $^{197}Hgdl_2$ into thyroid tumor, experiments were carried out as follow. 20 to 24 hours after intravenous injection of $^{197}Hgcl_2$ 1.0 to 1.5 mCi, operation was performed, and thyroid tumor, a piece of normal tissue around the tumor, metastatic regional lymphonde and a part of the anterior cervical muscle were resected, and at the same time blood 1 ml was withdrawn. Radioactivity of every tissue was measued by a well-type scintillation counter. The retention value per g-tissue wet weight in every tissue was calculated.

In thyroid cancer the retention value was markedly greater than in any other tissue. Although in thyroid adenoma the uptake of $^{197}Hgcl_2$ showed slightly higher than in any other tissue, and in thyroid cancer showed significantly higher as compared with thyroid adenoma.

These results not only support that ^{197}Hg scanning for thyroid cancer in a valuable diagnostic method, but also suggest that the evaluation of $^{197}Hgcl_2$ uptake into thyroid tumor is useful the detection of small sized or cystic degenerative thyroid cancer.

TSH Responses to Synthetic Thyrotrophin-Releasing Hormone (TRH) in Thyroid Diseases

C. S. KOH, S. J. CHOI, J. S. LEE, M. LEE
Department of Internal Medicine, College of Medicine Seoul National University, Seoul, Korea

Serum TSH levels were measured by radioimmunoassay before and after intravenous administration of synthetic TRH to 15 normal subjects. 56 patients with primary thyroid disease and 5 patients suffering from Sheehan's syndrome to evaluate pituitary TSH reserve and its diagnostic availability.

In normal subjects, serum TSH levels following synthetic TRH injection peaked at either 20 or 30 minutes and returned to baseline at 180 minutes. In euthyroid group, changes of serum TSH level following synthetic TRH administration showed no significant difference from that of normal subjects. In hyperthyroid group, there was abscence of serum TSH responses to synthetic TRH. Patients with primary hypothyroidism showed exaggerated

TSH responses to synthetic TRH despite their high basal TSH levels. Patients with Sheehan's syndrome revealed failure of serum TSH responses to synthetic TRH.

It can be concluded that TRH stimulation that would be useful as a means of detecting early forms of hypothyroidism and hyperthyroism in the abscence of abnormalities in conventional indices of thyroid function.

Use of ^{123}I for Thyroid Uptake and Scintigraphy

K. SAEGUSA, G. UCHIYAMA, M. KAWANA, Y. KUNIYASU, H. AKIBA,
T. YAMAMOTO, K. IINO, and S. TADA
Department of Radiology, Chiba University School of Medicine, Chiba

Iodine-131 has long been used for the thyroid uptake test and thyroid scintigraphy in spite of its high gamma ray energy and its high radiation dose. Recently, cyclotron-produced ^{123}I has become available in our country. The prupose of this study is to evaluate ^{123}I for clinical use in place of ^{131}I. The ^{123}I preparations were supplied by The Physics and Chemistry Research Institute, and The Nihon Medi-Physics Incorporation. The gamma ray spectrometry with a Ge (Li) detector proved small quantities of ^{121}I and ^{124}I in the former products, and those of ^{124}I, ^{126}I, ^{130}I, and ^{131}I in the latter products. Thyroid uptake tests were perfomred with the standard techniques at 3 and 24 hours after oral administration of radioiodine, and the thyroid scintigraphy were made by a rectilinear scanner or a scintillation camera. Thyroid uptakes of ^{123}I did not coincide so well with ^{131}I when the tests were performed one after another, but they coincided very well when patients were given both radioiodine simultaneously and measured by the double tracer technique. Thyroid scintigrams of ^{123}I were as excellent as those of ^{131}I except a few cases showed slight increment of the background density. The radioactivity of ^{123}I in the thyroid at 3 hours decays one third in 24 hours. Of 64 patients studied, 59 or 92% showed higher count rate in the thyroid region at 3 hours than 24 hours. The thyroid scintigram using ^{123}I, therefore, is better to be made in 3 to 6 hours while the radioactivity well remains in the thyroid tissue. Iodine-123 will soon become an useful agent for the thyroid studies in our country.