

3) The scintiscan can be of significant value in evaluation of patients with suspected or early stage of bone tumors, even if the patients had negative skeletal roentgeno-

grams. The profile scanning especially, would be very useful as a screening procedure to find out bone lesions with ^{85}Sr .

Diagnosis of Hormones Responsible for Breast Cancer, and Hormonal Activity in Serum

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A simplified method for determination of hormones responsible for breast cancer was studied using tumor slices in vitro. ^{32}P -uptake into nucleic acid of tumor slices was activated by addition of dependent hormones, and was suppressed by sensitive hormones. Spontaneous and cortisol. Responsible hormones for breast cancer were varied individually. This method is manifestation of hormonal influence for tumor itself. From these results, the postoperative desirable treatment for breast cancer were suggested.

Etrogens, androgens activity in serum were

determined by use of castrated rat uterus and prostata. Cortisol activity were also determined by castrated-adrenalectomized rat liver. The RNA-polymerase activity or protein synthesis of these organs were activated by the existence of steroid hormones. Determination of hormonal activity in serum is difficult by other method, and needed a good deal of serum, so the present method is useful by 2ml serum test. But enzymatical activity except hormones, protein effects and usual stock of castrated animals are remaining problems for this method.

Clinical Application of Radioactive Isotopes in the Diagnosis of Breast Cancer

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The application of ^{33}P in the diagnosis of breast cancer:

To differentiate between the malignant and the benign tumors, 79 breast tumor patients were given radioactive phosphate solution intravenously at the dose of 6 to 8 μCi per kg body weight. The ^{32}P incorporations by the tumor or the contralateral normal breast were assessed by means of a Geiger-Müller counter placed over the skin surface. Both malignant and benign tumors were divided into three groups from the percent increase in the ^{32}P incorporation by the tumor over the control. Thirty-two malignant tumors comprised 23

tumors of the group A (>30%), 3 of group B (20~30%), and 6 of group C (<20%), while 47 benign tumors did 4 of group A, 6 of group B and 37 of group C. Six malignant tumors of the group C were consisted of the 2 small (<1 cm in diameter), the 3 deeply located and the one scirrhous tumors. Two of the 4 benign tumors of the group A showed huge fibroadenoma and other 2 did premenstrual mastopathia. The minimum diameter of cancer detected by this method was 1.2 cm. The results would lead to the conclusion that it is not so worthy to apply this method to the diagnosis of early breast cancer.

The application of radioactive isotopes in the diagnosis of hormone dependency of breast cancer:

To investigate in vivo and in vitro the effect of estrogen on the breast cancer incorporation of ^{32}P or ^3H -thymidine, the measurement of nucleic acid fractions and the technique of autoradiography were employed.

An increase in the radioisotope incorporation was noted in about 40% of breast cancers and no change or the decrease in about 60%.

Those tumors in which clinical improvement were obtained by the endocrine therapy had the aforementioned increase which had been tested previously, and those of no clinical effect belonged in another group. It is therefore concluded that the aforementioned increase would imply hormone dependent tumor and these techniques would be useful for the diagnosis of hormone dependency of breast cancer.

Tumor Affinity of ^{131}I -Fibrinogen

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Recently, we found that the degree of tumor affinity of ^{131}I -fibrinogen was greatly dependent on the labeling process. In an experiment with 180 sarcoma-bearing mice, the tumor to muscle concentration ratio was 25.1 at 24 hours following intravenous injection of ^{131}I -fibrinogen labeled by modified method from Bocci's.

In clinical trials, ^{131}I -fibrinogen was administered intravenously in doses of 0.4 to 1 mCi to each of the subjects having a variety of malignancies and other conditions resembling malignant tumors.

The patients were scanned 24 hours later using the isosensitive scanning device in our laboratory. Skin tests with this agent were negative and no side effects were observed.

Of the 31 cases with malignant tumors 21 showed good delineation of the tumor by scanning with ^{131}I -fibrinogen. The findings in the remaining 7 cases were equivocal and in other 3 cases were negative. The fibrinogen scan results were negative in 8 non malignant cases in which initial findings resembled those of malignant tumor.

Tumor Affinity Substances

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MAA Angioscanography and Rapid Serial Angioscintiphotography with and without Nor-adrenalin.

Summary:

Serial scanning after intra-arterial injection of Macro-aggregated Albumin (MAA), that is angioscanography, was performed in

the cases of neoplastic and non-neoplastic disease. Positive tumor scans were obtained in 88 (84.6%) of 104 neoplastic cases and negative in 17 (74.9%) of 23 non-neoplastic cases. Nor-adrenalin was introduced into the arteries before MAA was injected. In this series, positive tumor scans were increased to