

## **Studies on localisation of uterine cervical cancer by using intracavitary areascanner**

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Although the usefulness of  $^{32}\text{P}$  for the detection of uterine cancer is suggested, inability of devising an appropriate detector limited the practical use of  $^{32}\text{P}$ . Thus a new intracavitary area scanner was devised using  $\beta$ -ray semiconductor detector of side window. The detail of this instrument has been reported in the 11th annual meeting of Japanese Society of Nuclear Medicine. To test the effectiveness of this instrument, 5 to 8  $\mu\text{Ci}$  of  $^{32}\text{P}$  was injected intravenously to 27 patients with uterine cancer, and scanning was performed 24 to 48 hours later. The speed of

scanning was 25 mm/sec and scanner arm was rotated 10–20 degree. Conization of cervix uteri was made and histological study was further performed to show the specificity and sensitivity of  $^{32}\text{P}$  scanning. It was found that about 85.7% of abnormal  $^{32}\text{P}$  scanning did actually indicate the presence of uterine cancer. Furthermore,  $^{32}\text{P}$  scanning indicated the presence of a small and localized cancer in that vaginal smear was positive but punch biopsy was negative. It is suggested that  $^{32}\text{P}$  scanning is practically useful in detecting an early stage of uterine cancer.

## **Scintigraphy of the Malignant Tumor with $^{131}\text{I}$ -Fibrinogen**

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Scintigraphic studies have proven that in pleuritis carcinomatosa, after receiving intracavitary infusion of RISA, remarkable cancer affinity was sometimes shown. This is the background of the start of our investigation. Furthermore, for the purpose of the field collimation of radiation therapy positive delineation is more desirable than negative on the detectability of malignant tumor.  $^{131}\text{I}$ -Fibrinogen has been found to have an affinity for some human neoplasms.

Patients with a variety of tumors were studied after receiving 1 mCi of  $^{131}\text{I}$ -Fibrinogen intravenously. Scintigraphies were usually performed 10 to 30 hours after injection. In the head and neck region thyroid block was previously performed, in the pelvic region urine was evacuated before scintigraphy.

A positive delineation was found in 23 cases of 42 patients (54.8%). We observed striking tumor

with the neoplasms of paranasal sinuses; in 8 of 9 patients with the pelvic malignancy; in all of 3 patients with the malignant tumor of soft tissue of extremities; in all of 2 patients with the carcinoma of oral cavity.

We could not only surely recognize a positive delineation in 3 out of ten malignant lymphnodes of head and neck region and axillary region; in 1 out of 3 malignancies of larynx and tonsils and in 1 out of 2 carcinomas of thyroid. We could not detect in all of 9 patients with the bronchial carcinoma.

Erysipelas of the face occurred after the radiation treatment of carcinoma of maxillary sinus was not recognized as positive. Furthermore, reticulum cell sarcoma of maxillary sinus after radiation treatment was not delineated, but it was delineated as positive with tumor recurrence.

No untoward reaction of  $^{131}\text{I}$ -Fibrinogen was

observed.

In conclusion,  $^{131}\text{I}$ -Fibrinogen was excellent radiopharmaceutical for tumor detection of

paranasal sinuses, pelvic region and soft tissue of extremities.

## **Diagnostic Values of Microquantitative Determination of $\alpha$ -Fetoprotein by Means of Radioimmunoassay**

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Determination of serum-AFP was made by means of radioimmunoassay. The principle of the determination is due to the application of competition on the occasion when the labelled and non-labelled AFP react with a certain amount of antibody. The normal values was  $5.7 \pm 6.7$  ng/ml in the standard deviation.

The influences of adding the human serum and equine serum were nearly the same degree on the standard curve.

A rectilinear correlation was observed between the diluted concentrations of the sample and its values.

Serum AFP was determined in comparison with  $^{198}\text{Au}$  liver scanning on 105 cases of malignant tumor.

Abnormally high values were observed in the

cases of primary hepatic cancer, fetal hepatic cancer, partial metastasis of hepatic cancer to the liver.

Many cases of the large intestinal cancer and pancreatic cancer showed less than 12 ng/ml even in the metastasis to the liver scanning. No correlation was observed between the size of the spaceoccupying lesion and AFP-values on the liver scanning of the malignant tumor. A distinct difference was observed on the serum AFP values between the metastatic cancer and the primary hepatic cancer.

It seems possible to make early diagnosis and to raise the diagnostic hitting rate of the primary hepatic cancer, by means of microquantitative determination with radioimmunoassay as to the serum AFP.