## Fundamental Evaluation on Diagnosis of the Stomach Cancer with $^{32}P$

R. Sassa, T. Iwase and T. Unuma
*The Institute for Adult Disease, Asahi Life Foundation, Tokyo*

M. Iio and H. Kameda
*Second Department of Internal Medicine, University of Tokyo, Tokyo*

S. Takayanagi, T. Sugita and T. Kobayashi
*Toshiba Research and Development Center, Tokyo Shibaura Electric Co., Ltd., Kawasaki*

Several reports were made on our attempt to diagnose malignant tumor by the use of $^{32}P$ and catheter-type semiconductor radiodetector. Even though promising results were found in the diagnosis of esophageal, pulmonary and uterine cancer, but in the cases of the stomach cancer certain number of cases showed either false positive or false negative results.

In order to elusidate the unsatisfactory results of the diagnosis of stomach cancer, secretive function of the stomach was examined, which was very different from other organs. After $^{32}P$ administration to the living bodies, following results were obtained.

(1) After $^{32}P$ administration to the dog, radioactivity in the blood showed rapid decrease, but in one hour or two it reached to the plateau till 24 hours later.

(2) When $^{32}P$ was administrated to the dog, both uptake and excretion of $^{32}P$ by gastric mucosa were quite rapid. As to the changes of radioactivity in the gastric mucosa in the course of time, no fundamental difference was found between the body and antrum of stomach.

(3) In case of the rat experiment, as to the organic distribution of $^{32}P$ between the esophagus, stomach, large intestine, liver and spleen, the lowest values were obtained in the esophagus at 4 hours and in the stomach at 21 and 45 hours. This fact revealed the rapid turnover of $^{32}P$ in the stomach.

(4) Hyoscine-N-butylbromide did not affect the excretion mechanism of $^{32}P$ to gastric juice.

## Measurement of $^{32}P$ Uptake of Esophageal Diseases by Catheter-type Semiconductor Radiation Detector

Y. Sakamoto, T. Ohata, T. Watanabe, T. Kasuga, T. Yokoyama, H. Fujimori, F. Nakanishi, K. Kiyono and T. Kobayashi
*Department of Radiology, Faculty of Medicine, Shinshu University, Matsumoto*

Fifty seven cases of esophageal diseases including 44 esophageal carcinomas were tested by radioisotope method. The probe of 3.2 mm diameter (Katelix probe, TCK-3-88CO17) was inserted into esophageal lumen. About 24 hours after intravenous administration of $^{32}P$ sodium phosphate (0.5 mCi), accumulation of $^{32}P$ in the esophageal tissue was counted and recorded by Katelix probe by the pull-out manner. $^{32}P$ uptake was measured twice in each case and showed good reproducibility. More than 50% increase in counting rate over normal area was regarded as positive for carcinoma. All cases of eso-

phageal carcinomas showed positive results.

In 20 cases of 24 esophageal carcinomas treated by telecobalt therapy, $^{32}P$ uptake showed more smaller value than the normal tissue level. It was noted that $^{32}P$ uptake of normal tissue around the lesion showed lesser $^{32}P$ uptake.

In one recurrent case of esophageal carcinoma treated by telecobalt, $^{32}P$ uptake showed positive result 5 years later. Another case of esophageal carcinoma treated by telecobalt showed suspicious finding of recurrence on roentgenogram, $^{32}P$ uptake showed negative result 4 years later, however. It should be emphasized that a case of post-irradiated recurrent carcinoma could be distinguished by the degree of $^{32}P$ uptake from cicatricial narrowing.

In 3 cases of 4 patients with reflux esophagitis complained heart burn, $^{32}P$ uptake showed increase up to about 50%. In 3 cases with radiation esophagitis following telecobalt therapy of lung carcinoma and breast carcinoma, $^{32}P$ uptake decreased to 40–80%.

## Studies on the Diagnostic Test of Breast Tumor with $^{32}P$

Y. Yonahara, M. Kawato, M. Ishida and I. Kuramitsu

*Department of Internal Medicine*

K. Ishiyama and T. Denda

*Department of Surgery*

*Second Tokyo National Hospital, Tokyo*

As a diagnostic methods of breast tumor the uptake of the administrated $^{32}P$ with G-M tube from surface of the skin has several limitation.

We were performed to clarify the transitional variation of surface counting and geometrical differences between nipple area and other quarters.

The outline of our studies were as follows.

1) In the normal breast $^{32}P$ is taken up in the nipple areas much more than in other quarters and in quarters almost the same uptake of $^{32}P$ was noted.

These tendency is as higher as than young married women under 30 years.

2) Uptake of over fifty ages, especially in male, is lower than in women and other young persons.

3) When comparison with tumor tissues and other breast diseases—Fibroadenoma, abscess and gynecomastia—in over fifty age, the uptake of nipple areas is higher than in others remarkably.

The above results suggest these conclusion: the hyperactivity in the nipple area following $^{32}P$ injection may be related not only activation of tumor tissue but also vascular retardation and stasis. Because of the variation being found in the $^{32}P$ uptake of the nipple area, measurement of breast tumors of nipple area must be carefully performed.