

sorption of ^{32}P in benign and malignant tissue. These differences in absorption are measured by micro G-M probe which is inserted into the vaginal cavity or the cervix. The clinical studies on the diagnosis of carcinoma of the cervix using ^{32}P -uptake have been made and discussed.

The outline of our studies were as follows.

1) As a first basic investigation, degree of ^{32}P concentration was counted on the surgical specimen of myoma and carcinoma. The ratios of the counting were from 0.33 to 1.50 for myoma vs. normal cases and from 3.5 to 6.45 for malignant vs. normal cases.

2) Measuring ^{32}P -uptake in the clinical cases, the ratios were lower than 1.30 in 77.5% of erosio portionis and higher than 1.51 in 88.1% of cervical cancer.

3) This examination utilizing ^{32}P -uptake, therefore, can be used as a secondary diagnostic aid to the early cancer of the cervix.

At the present time, however, it was felt that there would be difficulty in differentiating erosio portionis from every malignant lesions by these count rates only.

4) Because of the variation being found in the ^{32}P -uptake of cancer of the cervix, moreover, an approach to the radiosensitivity using ^{32}P was discussed. No significant relation was found, however, between ^{32}P -uptake and prognosis, except that many of the high ^{32}P -uptake group showed good results after the initial irradiation.

5) Furthermore, changes in ^{32}P -uptake and macroscopic or histological findings of the primary tumor were observed before and one week after the test irradiation (Tele-cobalt 100R). The cases with significant decrease of ^{32}P -uptake after the test irradiation showed marked macroscopic changes, suggesting their high sensitivity against radiation. Further investigation should be continued with more cases.

Diagnosis of Uterus Cancer Using Catheter-Type Semiconductor Radiation Detector

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It is known that in malignant tissue ^{32}P accumulates to a greater extent than in normal tissue. Attempts have been made to evaluate this property of the isotope as a means of diagnosing malignant tissue of the eye, skin, breasts, gastrointestinal tract and uterus. For this purpose micro G-H counter has been used. As a cath-type semiconductor radiation detector (CASRAD) has some advantages over micro G-M counter, it was used for the diagnosis of uterine and vaginal cancers by the authors.

Six cases of epidermoid cancers of the cervix, one adenocarcinoma of the vagina and one epidermoid cancer of the vulva were studied. All the cases were from Osaka Municipal Medical College.

In seven cases the radioactivity accumulated in the uterus was measured by a CASRAD

probe placed on the uterus through Cusco's speculum. The examinations were performed 3 to 5.5 hours after i.v. injection of $300\ \mu\text{Ci}$ of ^{32}P sodium phosphate.

In one case $300\ \mu\text{Ci}$ of ^{32}P was injected in the femoral artery according to Fujimori's method. The uterus was resected one hour after injection and the radioactivity was measured by CASRAD probe placed on the various region of the resected specimen.

In all seven cases examined under direct vision radioactivity on the tumor were 220% to 460% of that measured on the normal vaginal wall. In the one case examined on resected specimen the count rates on the area of cancer infiltration showed 130% to 140% of that on the normal tissue. Necrotic area of the cancer tissue, however, showed no increase in accumulation of radioactivity as

compared with normal tissue.

The results of the study shows the usefulness of this method for the diagnosis of uterine cancer. The advantage of CASRAD probe over G-M counter in this study is its smallness (2.7 mm in diameter) which enables

to know the spread of the cancer infiltration by scanning on the uterus. An instrument combined CASRAD probe and Cusco's speculum was reported in order to get better and longer placement of the detector on a region of the uterus.

Radiotubation

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Lots of methods for diagnosing the patency of fallopian tubes have been put into practice in fertility studies. However, it may be said that it is difficult to exactly diagnose the patency by each conventional method. Consequently on research for these causes, kymographic hysterosalpingography and radiotubation were tried simultaneously for the purpose of diagnosis of both morphological and functional conditions of fallopian tubes.

Namely, after the infusion of aqueous contrast medium (10 ml of 80% Angioconray) containing ^{32}P ($5 \mu\text{Ci/kg}$ weight) into uterine cavity, x-ray pictures were taken, and then 1 ml of venous blood was obtained from the cutaneous vein of elbow for the periods of 10, 20, 30, 60, and 120 min. respectively after the infusion. Thus, the counts of radioactivity of the venous blood were measured by GM counter after spontaneous drying for 24 hours. X-ray pictures were compared with the counts of radioactivity and some findings were obtained as follows:

1. In patent cases of both tubes on x-ray picture, the counts of radioactivity are inclined to gradually increase as time passes and continue the high value for the period of over 120 min.

2. In non-patent cases of both tubes, the counts of radioactivity show the lower value than in patent cases and are permitted to reach the maximum value in the period of 10 to 20 min. and decrease gradually with time. However, in the cases with angiogram, the counts of radioactivity reach in high value in 10 min. Furthermore, in the cases with hydrotubation, they increase with time as patent cases of both tubes.

3. In the patent cases of one side tube, no regular tendency of the counts of radioactivity of venous blood was found.

4. In the non-patent cases of both tubes, the counts of radioactivity of venous blood of the cases with tuberculous disease in history were a little higher than those of the cases with non-tuberculous infectious disease of abdominal cavity, or without any infectious disease in history.

In the non-patent cases, it is considered to be based on the absorption of ^{32}P through the internal surface of uterus due to intra-uterine pressure by infusion and intravenous inflow of ^{32}P , that the counts of radioactivity of venous blood show the maximum value in the period of 10 to 20 min. On the other hand, in the patent cases of both tubes, it is also considered to be based on the gradual absorption of ^{32}P through the peritoneum after the intraabdominal inflow through the tube, that the counts of radioactivity of venous blood are apt to increase in the period of more than 120 min.

The counts of radioactivity of venous blood in some patent cases of one side tube show the low value as the non-patent cases of both tubes. It may be considered as above mentioned, that wall of patent tube had become hard for the past inflammatory change of non-patent tube.

The patency of fallopian tubes may be diagnosed with contrast of each side with a newly devised radiotubation by which the patency is judged from ratemeter pattern of renogram apparatus, closely placing collimator on the abdominal wall with the infusion of ^{131}I into uterine cavity.