X. Tumors

Parasternal Lymph Node Metastasis of Breast Cancer Diagnosing By Radio-Colloid

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The surgery of breast cancer is to a large extent the surgery of lymphatics. Turner-Warwick and Halsell et al. studied the lymphatics of the breast by vital dye staining and radiography. Recently, Schenck reported about parasternal scintigram by radiogold colloid. The diagnosis of parasternal metastasis is difficult by internal mammary arteriography. ^{189}Au-colloid for parasternal scintigram is useful. The diagnosis was determined by comparing with the spots of normal side to tumor side. Cold spot of tumor side is to be positive metastasis, and warmer or hot change than normal side is to be suspicious metastasis. The density of spots is usually warmer than normla side after biopsy, and the histological diagnosis was reticulosis or fllicular hyperplasy or histiocytosis. Warm or weak spot than normal side exsisted sometimes cancer metastasis. In these diagnosis, normal was all negative metastasis, suspicious was 64.7% of metastasis, and positive was 64.3% of metastasis. In Stage I group, parasternal metastasis was 22.2% of positive, and in Stage III group, supuraclaviscular metastasis was 22.2%. Therefore, the removal of parasternal lymph node for Stage I, and the supuraclavicular lymph node removal for Stage III is to be emphasised important for radical mastectomy.

Scanning of Malignant Tumors with ^{131}I-Labelled Fibrinogen

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For the purpose of the field collimation of radiation treatment, sometimes scintiscanning was applied. Generally, malignant tumors were delineated as negative in the scintigram. On the other hand, brain tumor, some types of thyroid cancer and bone tumors were delineated as positive. Positive delineation was more desirable than negative. We were investigating the positive delineation of tumor by scanning technic aiming more easy and exact field collimation.

The affinity of ^{131}I-fibrinogen for the malignant tumor has been expected and this report presents the experience delineating human tumors using ^{131}I-fibrinogen.

One mCi of ^{131}I-fibrinogen was administered intravenously to each of 24 patients with malignant tumors, and they were scanned from 4 to 72 hours.

Positive delineation of the tumor was successful in cases of 3 cancers of maxillary sinus, thyroid cancer, metastasis of the right upper extremity from seminoma, myosarcoma of the right femur, metastatic focus of the

pelvic cavity from cancer of uterine cervix.

Poor delineation was seen in oral cancer, laryngeal cancer, metastatic focus of the lumbar spine and pelvis from cancer of uterine cervix and sacral metastasis from renal cancer.

Scintigraphic delineation was not obtained in 13 cases. These were pulmonray cancers, primary and metastatic lymph nodes and others.

The problem was that some part of ^{131}I was isolated from ^{131}I-fibrinogen after the I.V. injection. This disturbed the pattern near blood pool and urinary system as increment of background.

We expect the substances with higher tumor affinity for the detection of malignant tumor.

Affinity for a malignant tumor of radioactive mercuric compounds

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It has known that ^{203}Hg-compounds have affinity for malignant tumor, and among them ^{203}Hg-Chlormerodrin is used already in clinical scanning of a brain tumor. But this compound is not enough satisfactory for the scintigraphically positive delineation of tumor because of special affinity for kidneys and others. So, to discover the better compound and investigate the mechanism of accumulation in tumor, some ^{203}Hg-compounds were synthesized and these affinity for malignant tumor was examined.

Six compounds of ^{203}Hg-acetate, ^{203}Hg-Chlormerodrin, ^{203}Hg-EDTA, ^{203}-Hg-mercurochrom, ^{203}Hg-1-Mercuri-2-hydroxypropane were injected intravenously to the rats transplanted subcutaneously with Yoshida Sarcoma and these rats were sacrificed 3 hours, 24 hours and 48 hours after injection. The activities of the tumor, blood, muscle, liver and kidney were measured by a well-type scintillation counter. Retention values (dpm/g tissues weight) in the tumor, blood, muscle, liver and kidney were calculated. Generally, mercuric compounds tend to combine firmly with protein. In these six mercuric compounds, ^{203}Hg-acetate most firmly combines with albumin and ^{203}Hg-Chlormerodrin most weakly.

Retention values of the tumor, blood, muscle, liver were the greatest at 3 hours after injection and decreased then. But in the kidneys was the greatest at 24 hours after injection. Retention values decreased in order of the kidey, liver, blood, muscle, but in tumor the compounds which most firmly combines with albumin have strong affinity and ^{203}Hg-Chlormerodrin which weakly combines with albumin have weak affinity. So, we thought that ^{203}Hg-compounds were carried with albumin into tumor and accumulated in tumor after albumin was pinocyted and catabolized. The values of tumor/muscle ratio at 24 hours after injection were 24.2 in ^{203}Hg-Chlormerodrin, and were from 5.0 to 9.1 in other five compounds. From above-described results we may conclude that ^{203}Hg-Chlormerodrin in these six ^{203}Hg-compounds is most excellent in clinical use.