

### Clinical Evaluation of $^{67}\text{Ga}$ -citrate Scanning in Liver Cancer

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could have unusual infection of the lungs due to immunosuppression with no apparent chest radiographic abnormalities. One of 11 cases had polymyositis and exact cause of gallium accumulation could not be solved.

$^{67}\text{Ga}$ -citrate liver scanning has been carried out 76 patients. The degree of uptake of  $^{67}\text{Ga}$  was classified into 4 grades: great increase uptake (++) ; slightly increase uptake (+) ; equilibrated uptake ( $\pm$ ) and decreased uptake (-).

1) 29 patients with primary hepatoma, 16 showed (++) uptake, 9 showed (+) uptake and 4 showed ( $\pm$ ) uptake.

3 patients with cholangioma, 2 showed (+) uptake and 1 showed ( $\pm$ ) uptake.

22 patients with metastatic liver cancers, 1 showed (++) uptake, 13 showed (+) uptake, 5

showed (+) uptake and 3 showed (-) uptake.

2 patients with liver abscess showed (++) uptake.

5 patients with liver cyst and 15 patients with liver cirrhosis showed all (-) uptake.

2) No significant difference was found in degree of  $^{67}\text{Ga}$  uptake in primary hepatoma with AFP positive cases ( $>200$  ng/ml) and AFP negative cases ( $<200$  ng/ml).

3) Selective angiography were performed 26 cases, were classified into hypervascular type (11 hepatomas, 2 cholangiomas and 3 metastatic liver cancers) and hypovascular type (4 hepatomas, 1 cholangioma and 5 metastatic liver cancers).

Correlation of degree of  $^{67}\text{Ga}$  uptake and its vascularity observed by angiography as follows; hypervascular type showed (+)-(++)  $^{67}\text{Ga}$  uptake, hypovascular type showed (-)-(+) uptake.

### Mechanism of Tumor Affinity of Radioactive Metal Elements

#### —Relation Between Classification of Lewis Acid and the Form of Chemical Bond in the Tumor Tissue—

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Affinity of many inorganic compounds for the malignant tumor was examined, using the rats which were subcutaneously transplanted with Yoshida sarcoma. And the relations between the uptake rate into the malignant tumor and in vitro binding power to the protein were investigated in these compounds.

In these experiments, the bipoisitive ions and anions had not affinity for the tumor tissue with a few exceptions. On the other hand, Hg, Au and Bi, which have strong binding power to the protein, showed high uptake rate the into the malignant

tumor. AsHg<sup>++</sup>, Au<sup>+</sup> and Bi<sup>+++</sup> are soft acids according to classification of Lewis acids, it was thought that these elements would bind strongly to soft base (R-SH, R-S<sup>-</sup>) present in the tumor tissue.

In many hard acids (according to classification of Lewis acids), the uptake rate into the tumor was shown as function of ionic potentials (valency/ionic radii) of the metal ions.

It is presumed that the chemical bond of these hard acids in the tumor tissue is ionic bond to hard base (R-COO<sup>-</sup>, R-PO<sub>3</sub><sup>2-</sup>, R-SO<sub>3</sub><sup>-</sup>, R-NH<sub>2</sub>).