breadth with rightward deviation of the curve-peak.

With above mentioned data, it is considered that the measurement by a densitometer is one simple and useful method to quantify the scintiphoto. The authors have not experienced the more detailed memory method or "Autofluoroscope", but consider the significance of scintillation camera as "radionuclide angiogram" to be somewhat limited.

Scintillation camera as venogram is considered fairly valuable in clinical uses.

Hemodynamic Studies on the Prolonged Coma Using Radioisotope Techniques

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We studied cerebral blood flow by $^{133}$Xe and hepatic blood flow index by radioactive colloidal $^{198}$Au, mainly in "Apallisches Syndrom" group of patients with prolonged coma following severe head injury and of patients of inoperable brain tumor.

1. Hepatic blood flow index

   a) Using 3"×2" NaI honey-comb collimator average hepatic blood flow index (KL) was 0.41±0.04 in "Apallisches Syndrom" group, while normal was 0.20±0.02.

   b) Using 2"×2" NaI 6×6×8 cm cylinder collimator, average KL was 0.28±0.03 in "Apallische Syndrom" group and 0.12±0.03 in normal group.

   Both studies show that KL value is higher in twice in "Apallisches Syndrom". It may suggest that splanchnic circulation increases due to decrease in cerebral blood flow and in extremities circulation. We must note that KL value varies according to detector and collimator used.

2. Cerebral circulatory studies—Phantom studies

   Purpose of this study is to determine the most adequate portion for measuring CBFr (regional cerebral blood flow) and to study the effect of $^{133}$Xe which passes a lateral cerebral hemisphere and cerebral main artery on contralateral counting.

   a) Phantom was made by removing left cerebral hemisphere from cadaveric head and inserting a sealed plastic bag of 600 cc solution containing $^{133}$Xe 0.5 mCi. Using 2"×2" NaI 6×6×8 cm cylinder collimator we measured external monitoring of $^{133}$Xe in several areas of phantom symmetrically on both sides. Difference between right and left is greatest in temporal area just above external auditory meatus when detector is set 15° to head top. Contralateral counting was less than 13% of that on bag inserted side and showed lowest value comparing other portions and directions. Accordingly temporal area is preferable for measuring CBFr.

   b) Vinyl tube of I.D. 1.5 mm was set along with running of main branch of the anterior cerebral artery and the middle cerebral artery in left cerebral hemisphere of the cadaver. Water was running rapidly through this tube continuously and $^{133}$Xe 0.5 mCi was injected. External counting was made on temporal area using same method described in a).

   When $^{133}$Xe was injected only to the middle cerebral artery tube, contralateral counting was 16.6% of ipsilateral counting. When $^{133}$Xe was injected only to the anterior cerebral artery, contralateral counting was 42.3% of ipsilateral counting.

   Therefore, existence of cross circulatory blood flow to contralateral hemisphere through circle of Willis should be considered only when initial contralateral counting is higher than 42.3%.

3. Mean CBFr—Clinical Studies

   $^{133}$Xe 0.5 mCi. was injected selectively into
the internal carotid and mean CBF was calculated by 2 compartmental analysis of Rasmussen and Ingvar. It was 50–60 ml/100gr/min, in normal group and 28.7 ml/100gr/min. in “Apallisches Syndrom” group. Blood flow to contralateral hemisphere was often observed in “Apallisches Syndrom” group. In cases with brain tumor, no close interrelation was noted between increased intracranial pressure and decrease in mean CBF as some investigators suggested.

4. In many cases with marked shift of the

Cardio-vascular Bed Scintiphography Using $^{99m}$Tc-pertechnetate and its Metabolic Utilization

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Scintiphotos of cardiovascular system can be taken by intra-venous injection of $^{99m}$Tc-pertechnetate using scinticamera. It is possible to visualize vein, heart and artery as soon as the radioisotope is injected. However, cardiovascular bed scintiphography can be taken before $^{99m}$Tc-pertechnetate is metabolized, as a blood-pooling region of the body. In normal state, heart, spleen, kidneys and liver etc. were scintiphographed, and in the pathological conditions, tumor with sufficient blood supply, hemoangioma and inflammatory process such as acute osteomyelitis were detected by this cardiovascular bed scintiphography. As vascular group, 70 of 80 cases, including brain tumor, breast cancer and bone tumors etc., were positive in the site of interest. Contrast is poor in the lung and liver, because of their dual blood supply. In the region of overlapping with heart and great vessels and the metabolic substances, the timing of scintiphography is rather difficult. As avascular group, cystic diseases of liver, stomach and kidney were examined in 6 cases. $^{99m}$Tc-pertechnetate is metabolized in nearly the same as iodine, therefore, thyroid and salivary glands are visualized. But it is different that $^{99m}$Tc-pertechnetate is poorly reabsorbed in the intestine after its secretion intestine are well scintiphographed whenever this substance is present in these organs. $^{99m}$Tc-pertechnetate is also excreted in the urine, kidneys and urinary bladder are visualized, too. Cysto-scintiphotos are obtained in axial view, when it is scintiphographed in the sitting position from downwards, as well as the frontal and lateral views. In one of the 4 thyroid cancer, the tumor uptakes $^{99m}$Tc-pertechnetate, so positive tumor scintiphoto was obtained. The tumor of the salivary gland was detected as a filling defect within the normal gland. In all cases, in which $^{99m}$Tc-pertechnetate was injected, the stomach was visualized as early as 5 to 10 minutes after injection. This clinical application should be further investigated.

5. Increase of cross circulatory blood flow to contralateral hemisphere in “Apallisches Syndrom” group seems to be due to malfunction of the circle of Willis and marked brain atrophy.