

grade of vasospasm and the patient's clinical course.

(1) Vasospasm-Area (scan) Relationship

In the cases with bilateral abnormal scan, the larger the area the more diffuse the vasospasm.

(2) Neurological Severity-Area

In the cases with bilateral abnormal scan, the larger the area the severer the neur-

ological deficit.

(3) Prognosis-Area

The larger the worse the prognosis.

(4) Density-Vasospasm Relationship

No significant relationship was found.

In the cases with vasospasm and neurological deficit of no abnormal scan, the vasospasms were local

Value of the Brain Scan of the Aged

(Comparative Evaluation of Clinical and Pathological Studies)

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Brain scannings using 99m-TcO_4^- or 99m-Tc -pyrophosphate were performed on 296 patients of over 60 years old. Diagnoses were proved by autopsy in 64 patients and in 13 patients by operation. Among these autopsied cases thirty-eight or 50.0% of 76 lesions appeared as positive scan.

Patients with CVD formed the largest group of abnormal scans. Of 41 patients of this group, 14 or 34.1% had definite areas of increased activity where pathological abnormality was found. At autopsy, twenty-eight patients had significantly large lesions. In these 28 cases, abnormal scan finding was observed in or 50%. Negative scans among these were found within 4 days or after a few months after onset of CVD. The earliest positive scan in this series was observed at 4th day after onset of the stroke. The longest positive scan was observed throughout 9 months after the onset. Twelve patients had diffuse or small lesions at autopsy. All of patients of these group had negative scans. The time of maximum uptake of 99m-TcO_4^- by the CVD lesion

of the brain were different from case to case. The scans do not necessary remained positive for longer period in the slow recovery group than is the rapidly recovered group. But Case of grade I or II was better than that of III or IV in prognosis. (According to the relative density to the sagittal sinus, lesions were classified into 0, I, II, III and IV grades.) The size and shape of the lesion in scan were various.

In cases of brain tumor, the incidence of positive scan was significantly higher than that of CVD. Abnormal scans were detected in 16 or 88.9% of 18 patients. Two cases with negative scan had very small lesion or simultaneous complication of diffuse CVD. Positive brain scans were obtained in 6 out of 9 patients with subdural hematoma. Rim sign and doughnut sign were rarely found. Three patients with subarachnoid bleeding were scanned. One positive and two negative scans were obtained.

After scan-pathology correlation study, we can pick up several important points for the

reading of brain scan as an aid of the diagnosis of the aged cases with neurological symptoms.

1. In cases with abnormal brain scan, serial changes of density or size is useful for evaluation of prognosis in CVD as well as differentiation of tumor from CVD.

2. In the aged people, in whom brain tumor shows also the clinical findings similar to CVD, the brain scan was very useful. Several silent brain tumors were detected by screening brain scanning.

3. In cases of subdural hematoma, the aged patients do not frequently have proved history of trauma.

4. Eventhough over all accuracy of brain scan in cases with CVD (34.1%) is lower than those with tumor (88.9%), value of brain scan was accepted by attending physicians.

5. Value of pyrophosphate brain scan to differentiate CVD from tumor was proven and presented by other paper.

Diagnostic Aid for the Differential Diagnosis of Brain Tumor and CVD by using ^{99m}Tc -pyrophosphate

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As we reported previously, we have emphasized the value of brain scan with two ^{99m}Tc -labels; ^{99m}Tc -pertechnetate and ^{99m}Tc -pyrophosphate. The scan with these two labels may increase diagnostic accuracy and serve for immediate differentiation of brain tumor from CVD.

The purpose of the present investigation is further to show the value of combined use of those two labels for a brain scanning.

Twenty cases of brain tumor, and twenty two cases of other brain diseases such as cerebrovascular disorder (CVD), abscess, hygroma and etc, were examined by both ^{99m}Tc -pyrophosphate and ^{99m}Tc -pertechnetate.

The age distribution of those patients were 13 to 87 years old, with mean age of 61 years old.

In sixteen cases out of 20, successful visualizations of brain tumors are made by both ^{99m}Tc -pertechnetate and ^{99m}Tc -pyrophosphate.

Ten of those fifteen were histologically diagnosed either by operation or autopsy. The histological finding of those cases were as followed: 2 meningioma, 2 astrocytoma, 1 pituitary chromophobe adenoma, 1 neurinoma, 1 chondroma, 1 hypothalamus tumor and 2 metastatic tumor of the lung cancer.

A case with suspected brain tumor and another case of possible metastatic tumor showed no accumulation of activity by these two labels, proved later by autopsy that no tumorous lesion in the brain.

Sixteen cases of CVD were also examined with ^{99m}Tc -pertechnetate and ^{99m}Tc -pyrophosphate.

Conventional ^{99m}Tc -pertechnetate scan showed positive accumulation to the lesion in eleven cases of CVD. In these cases not appreciable accumulation of ^{99m}Tc -pyrophosphate was noted to the lesion except three cases of cerebral infarction.