

blood flow of the gray matter (20% increasing).

Gray matter flow and relative gray matter weight were remarkably increased from  $57.6 \pm 7.8$  ml/100g/min.,  $35.9 \pm 7.3$  ml/100g/min. to  $69.2 \pm 6.4$  ml/100g/min. and  $39.7 \pm 12.7$  ml/100g/min. respectively after shunt operation.

These changes of rCBF were observed signifi-

cantly by color functional imaging before and after shunt operation.

In conclusion, it seems that, there were some correlation between these operative results and mental improvement in the Normal Pressure Hydrocephalus of the aged patients.

### **Value of the Brain Scan of the Aged With Cerebrovascular Accident: A Study of Autopsy Correlation**

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Brain scannings using  $^{99m}\text{Tc}$ -pertechnetate and or  $^{99m}\text{Tc}$ -pyrophosphate were performed on 731 patients of over 60 years old. Diagnoses were proved by autopsy in 129 patients and in 11 patients by operation. Because of 12 patients having 2 or 3 lesions each, total number of brain lesions became 170.

The histopathological findings were correlated with brain scan findings. Of 170 lesions, 15 (8.8%) of the brain scans were normal, with no lesions at autopsy. In 77 (45.3%), the brain scans were observed as abnormal and lesions were proved by autopsy (positive correlation). Thus in 54.1% of the lesions, the scan-autopsy correlation was correct. In 72 cases (42.4%), the scan was normal but brain showed lesions at autopsy (false-negative). In 6 lesions (3.5%) were the scans abnormal and no lesions found at autopsy (false positive). In 45.9% of the lesions, therefore, the scan-autopsy correlation was incorrect.

The overall incidence of false-negative scans in our study was 42.4% (72 lesions). Most of such

cases were due to vascular lesions, the remainder to brain tumors. Size in scan is an important factor in the detection of brain lesions. It is expected that lesions larger than 10 mm. will be readily delineated. Therefore, in about 80% of the false-negative scans, lesions were less than 10 mm. in size. Thus not only the size but also the interval between onset of symptoms, most false-negative scans are caused by long interval between onset and scan.

In cases with CVA, the frequency of positive scans were high in clinically severe cases and in patients with worse prognosis, but there is no correlation between change of density of hot lesion and clinical symptoms.

Positive brain scans were obtained in 7 or 53.8% of patients with subdural hematoma. Aged patients with subdural hematoma do not frequently have proved history of trauma etc. In our 13 cases, six patients had no history of contusion. Rim sign and doughnut sign were rarely found.