cerebral vascular diseases such as A-V malformation and infarct.

Lesions adjacent to or superimposed on normal anatomic structures was separated by sequential scanning. The tumor scan with ^{67}Ga-citrate was able to exclude postcraniotomy bone-flap activity as seen on ^{99m}Tc brain images. Therefore it was proven helpful in differentiating recurrent intracranial tumor from the craniotomy site. Cisternography could make easier to detect the tumors in the region of posterior fossa and cranial base and also be useful for planning of therapy in meningitis.

Although, brain scanning is not specific study, it could be possible to improve accuracy of differential diagnosis of brain diseases by digital processing of scan data. Each radioisotope study contains rather poor information, however, if the combined study is systematically done, many useful informations could be obtained.

Regional cerebral Blood Flow Studies in the Acute Phase of Subarachnoid Hemorrhage

—Preoperative study—

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Abnormal cerebral blood flow has been found in the patients with subarachnoid hemorrhage (SAH). The present studies were to discuss the alteration of cerebral blood flow and regulation of cerebral blood vessels in the relation to the duration from the onset and to the arterial spasm.

Method and Materials: Fourty one patients with SAH of preoperative cases were examined. Except one case, cerebral aneurysm was detected by 4 vessels serial angiography.

rCBF studies were carried out using a 6 channel system with ^{133}Xe clearance method, In the first stage, rCBF of the rest stage was measured, and then, the response of rCBF to hypercapnea induced by 5% CO_2 inhalation and hypotension induced by Regitin was examined.

Regional cerebral blood flow of each region was calculated by digital computer with height over area method to estimate the rest state rCBF and initial slope method to the functional studies. During these examinations, $PaCO_2$, PaO_2, pH and blood pressure of internal carotid artery were measured.

All subjects were examined by serial angiography of ipsilateral carotid artery on the same day.

Results: On the patients of SAH at the acute stage, dynamic changes of hemispheric CBF, regional distribution of CBF, regulation of cerebral blood vessels and arterial spasm were ob

served in the relation to the duration from the onset.

The results were summarized as follow;

1) 0–3 days after the onset; Hemispheric CBF was decreased (38.0±8.1 ml/100 g/min.), focal hyperemia and ischemia was not so common. Loss of autoregulation and impaired response to hypercapnea was observed in about 60% of examined cases.

2) 4–7 days after the onset; It was note worthy that recovery of hemispheric CBF was observed in this stage (43.3±7.7 ml/100 g/min.). Vasoparalysis and loss of autoregulation was become to more prominent, frequency of arterial spasm was about 50%.

3) 2 weeks after the onset; Disturbance of cerebral hemodynamics was most prominent. Hemispheric CBF was decreased again (35.3±7.6 ml/100 g/min.), regional hyperemia and ischemia was most frequent in this stage (about 50%), vasoparalysis and loss of autoregulation was observed on most cases and was spread widely in the hemisphere. Angiospasm was observed 17 cases out of 20 cases.

4) Over 3 weeks; Only 7 examinations were done at this duration. Hemispheric CBF and angiospasm tended to recovery, but global loss of autoregulation was observed in 2 cases out of 3 cases at more than a month after the onset.

5) The results described above were confirmed also by follow-up observation of five cases.

6) Significant correlation between hemispheric CBF and consciousness of patients was observed.

RI Angiography and Cerebral Blood Flow Measurement with a gamma Scintillation Camera and a Data-store Playback Accessory

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RI angiography following rapid intravenous (or occasionally intra-carotid) injection of 5 to 10 mCi of ^{99m}Tc pertechnetate has been routinely performed on the patient suspected of haboring an organic cerebral lesion, using a gamma scintillation camera and a data-store playback accessory. The merit and demerit of using a VTR system are pointed out.

Abnormal findings in RI angiograms are classified as (1) displacement, (2) increased radioactivity and (3) diminished radioactivity.

RI angiogram is most useful in the diagnosis of cerebrovascular disease, especially of occlusive nature. Up to date, more than 40 patients of acute as well as chronic phases of stroke were examined. The over-all result of static imaging was approximately 60 per cent positivity, but the RI angiogram disclosed abnormal findings virtually in every case. The RI angiogram in cerebrovascular occlusive disease essentially shows a diminished activity with delayed appearance and clearance. In 30 cases of arteriovenous anomalies and 2 cases of a giant aneurysm, an increased focal radioactivity with early appearance and clearance was specific. All 30 cases of arteriovenous anomalies showed specific abnormalities on RI angio-