and CSF pulsation were recorded simultaneously.

Two types of echogram, showing a mirrorimage of each other, were observed. The echogram was found to resemble CSF pulsation, showing close relationship with brain pulsation. Its gross synchrony with external carotid rheogram indicated its close relationship with arterial pulsation.

Measurement: Rise time of an echogram curve (AB), time interval between R-peak of ECG and the starting point of an echogram curve (RA), and time interval between the starting point of an external carotid rheogram and that of an echogram curve (EA) were measured.

In normal human subjects, AB was more than 200 msec., RA was 113–150 msec. and EA was less than 20 msec.

In cases of intracranial hypertension, AB was below 200 msec, showing a shortening, and degree of the shortening was roughly proportional to degree of intracranial hypertension. In brain tumor cases, it was generally found that AB was normal and RA was prolonged on the tumor side, and that AB was shortened and RA was normal or slightly prolonged in the normal side.

In cases of cerebrovascular lesion and in headache cases where stellate ganglion blockade was clinically effective, RA and EA were markedly prolonged whereas AB was usually normal. In those headache cases, clinical effect on headache of the blockade was paralleled by shortening of RA and EA.

In order to substantiate these clinical findings experimentally, intracerebral rheogram, instead of echogram, was recorded in dogs and its relationships with changes in intracranial pressure and in cerebral circulation were examined. Consequently it has been inferred that RA and EA of echogram can express changes in cerebral circulation and that AB can be influenced markedly by changes in transmitting media of pulsation.

r-2. Experimental and Clinical Studies on the Emulsified Positive Ventriculography

Part II. Ultrasonic Emulsified Myodil Ventriculography

Junichi WAKISAKA and Tongwa LEE

1st Department of Surgery, Kurume University School of Medicine

Shinken KURAMOTO, Mitsuo WATANABE and Kyoko YOSIMURA

Neurosurgical Clinic, Kurume University School of Medicine

Ventriculography is one of the important supplementary methods of diagnosis in the neurosurgery. Up to now, for ventriculography the pneumoventriculography as well as the fractional ventriculography by means of an oil contrast medium has generally been practiced, but in the former the contrast obtained was in some

degree insufficient to know minute changes in the ventricle, while in the latter the entire ventricle could not be visualized.

Thereupon, the trial to visualize the whole ventricle uniformly with an emulsion of Myodil emulsified in a physical process revealed that the ultrasonic irradiation excels most in emulsification. It was, however, ascertained that its emulsification is restricted, since the Myodil cannot be emulsified perfectly with this ultrasonic irradiation alone. Then it became clear that it can be emulsified perfectly by adding a small quantity of the autoserum (0.5 ml.) regarded as having the least influence on the organism to it.

From our experiences with the model ventricle, animal experiments and its clinical use it was found that the contrast of the ultrasonic emulsion of Myodil prepared in this way containing 15 ml. of the cerebrospinal fluid, 3 ml. of Myodil and 0.5 ml. of the autoserum or its double-diluted solution is able to visualize the ventricle thoroughly.

The physicochemical properties of this emulsion do not affect the chemical nature of Myodil, its particles are fine and uniform excelling in diffusion and stability, and its pH approximates that of the cerebrospinal fluid.

In order to investigate the reactions occurring at the time of injection the present emulsion into the ventricle, the ultrasonic emulsion was injected into the ventricle of dogs. The responsive effects evoked by the ultrasonic irradiation of emulsion alone or by the double-diluted solution of the condensed emulsion were slight. In conclusion, the emulsified positive ventriculography executed in the ventricles of 4 clinical cases, suggested the excellency of this contrast. It produces almost no ill effects and seems to have a great diagnostic value. Nevertheless, in case of its clinical use the emulsion in the ventricle should be eliminated from it thoroughly by washing with physical saline solution after roentgenography and remained the ventricle drainage.

r-3. Studies on the Ultrasonic Attenuation in Various Intracranial Phenomena

Kazuya EHARA, Furitsu IKEYA, Minoru MAEDA, Hiroshi WATANABE,
Kunio YUKISHITA and Kenji TANAKA

Department of Neurosurgery, Juntendo University School of Medicine

Usefulness of ultrasonic attenuation (UA) measurement in various intracranial phenomena have been pointed out in the field of diagnosis of brain diseases. However, it has not yet been established sufficiently where and how UA occurred. We have already reported the change in UA in relation to the histological variations in human brain. Thereafter, we have observed all the echoes on an oscilloscope which were synchronously changed in heights with heart beat. The following model experiment was performed to determine whether or not UA was origi-