treatment of these patients. Cerebral carotid angiography is one of the most practical and useful method of diagnosis for these cases.

The findings of cerebral carotid angiography were studied from the operative findings or through autopsies and compared with the clinical symptoms in dividing into the living and dead group.

The results of 42 cases (cerebral contusion 9, intracranial hematoma 33) were as follows:

1) In frontal view, the shift of anterior cerebral artery (A1-A3) were recognized in 10 out of 14 cases in the living group, but all 19 cases in the dead group. Angle formation at the transition of A1, A2, A3 and A4 which is called Cognack Schwenker's Bild by Huber was seen in 2 cases of the living group, but 6 cases in the dead group. Arch formation was seen only in the 6 dead cases. Angle formation is said to be characteristic in extradural hematoma and intracerebral hematoma of frontal region, but these changes in the anterior cerebral artery are considered to be emphasized by cerebral contusion and the resulting cerebral edema.

2) In frontal view, the shift of the terminal internal carotid artery toward the mid-line is usually recognized in hematomas of the temporal region, but these findings have also been in hematomas of other region in the dead group. 12 cases of the 19 dead cases presented this change and especially in 4 cases, the shift approached to the mid-line. These changes are considered to be caused by cerebral contusion and the resulting cerebral edema.

3) In lateral view, the sylvian group of middle cerebral artery had a tendency to be straight in the dead group.

4) Visualization of the posterior cerebral artery were gained in 50%. Findings of transtentorial herniation were seen in 6 out of the 7 dead cases.

It may be summarized that cerebral carotid angiography is of great importance and useful not only to seek the location of hematomas but also to diagnose the indication of operation, to predict the prognosis.

S-A-7. Quick Diagnosis of Intracranial Hematomas by Ultrasound

Kazufumi Ito, Yuichi Abe and Kenji Tanaka

Neurosurgical Clinic, Department of Surgery, Juntendo University School of Medicine

The clinical values of ultrasonic diagnosis of intracranial hematoma by means of pulse method will be presented.

The transducer was used barium titanate crystal of 10 mm in diameter at a
frequency of 2.25 megacycle through the intact skull. The echoes were displayed on the Braun-tube by an A-scope indication.

The present writers already confirmed clinically that the ultrasonic findings of intracranial hematoma were as follows:
1) The shift of the third ventricle echo.
2) Detection of the hematoma echo.
3) Increase of the ultrasonic attenuation. In this paper, two points on the clinical values of the ultrasonic technique for diagnosis of the intracranial hematoma were discussed, that is, the shift of third ventricle echo and hematoma echo.

The observation of the third ventricle echo shift is very valuable for the screening test of head injury. However, diagnosis of intracranial hematoma should be performed by detecting intracranial hematoma echo. Accuracy of the third ventricle echo shift were studied and 3435 patients with head injury were discussed by this method. In 200 out of 3435 cases with head injury, the shifted third ventricle echo was obtained and 99 cases of them were operatively diagnosed as intracranial hematoma. On the other hand, 3235 cases of head injury that was included 13 cases of intracranial hematoma revealed no shift of the third ventricle echo.

Furthermore, in 76 out of 117 cases of our series of intracranial hematoma, hematoma echo were correctly detected. The possible threshold of detecting extracerebral hematoma echo was about 5.0 mm in thickness of hematoma.

Ultrasonic examination is very valuable for the quick diagnosis of head injury.

S-A-8. Ultrasonic Attenuation in Brains of Acute Head Injury (Potentiality to Detect the Neurologic Deterioration after Head Trauma)

Masuhisa Oka, Ichiro Fujita, Hiroshi Aoyama, Kenyo Nakaima and Takuhei Kido

Division of Neurosurgery, Department of Surgery, Wakayama Medical School

Ultrasonic attenuation of the head is to be estimated with the absorption coefficient of the brain, in order to observe changes in acoustical functions of the injured brain correctly.

During the acute stage of head injury there is a certain correlation between clinical symptoms and changes in ultrasonic attenuation. Impaired symptoms are found in half of cases with the decrease in attenuation of the head, one third of cases remaining with neither deterioration nor improvement, and the improve-