55. An Experimental Study of Stereotaxic Lesion on the Cat Brain by Focused Ultrasound

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The concave barium titanate focusing irradiator has been used in our laboratory. Newly, the x-ray control, stereotaxic operation table, focusing irradiator were improved. Cat brains were irradiated at frequency of 1 Mc/sec; the peak intensity at the focus was 1400 W/cm². The present study was the report that neuropathological effects of irradiation with focused ultrasound were observed the lesion of the cat brain. The lesions were followed 3 hours to 3 months after irradiation. Especially, nerve cells, myelyn sheaths, blood vessels and glia cells were studied histopathologically. Lesions could be made in the white matter or grey matter. These examples gave the result that the grey matter was less susceptible than the white matter to the destruction of ultrasound. The sharply linear lesion could be produced at the boundary between the white matter and the grey matter. Furthermore, destruction of the hypophysis of the cat could be made by focused ultrasound.

Recently, the present writers carried out a study whether it is possible to detect the focused lesion in the cat brain tissue by means of ultrasonic echo method. Focused ultrasound of which maximum intensity was 1.4 KW/cm², irradiated through the parietal dura mater into the cat brain. At the same time, echo detection was tried from the focused region by using an ultrasonic detecting transducer, 10 mm. in diameter and frequency of 5 megacycle which was placed on the dura mater through temporal burr hole. Immediately after the irradiation of focused ultrasound 5 seconds, there was able to detect an echo reflected from the focused region. The echo intensity diminished with the lapse of time and the echo was completely disappeared in nearly three minutes after irradiation.

56. Induced Exacerbation of Parkinsonian Rigidity

—Clinical and Electromyographical Investigation—

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Recent increasing interest in basal ganglia surgery for tremor and rigidity
in Parkinsonism would seem to warrant more critical measures for evaluation of these symptoms, not only for the purpose of assessment of surgical results but also to elucidate the underlying neurologic mechanisms. A total of 197 Parkinsonians were investigated for rigidity by clinical examinations and marked exaggeration of rigidity was observed in 82%.

113 Parkinsonians and 20 normal controls were investigated electromyographically. In normal persons or postoperative Parkinsonians, who had complete alleviation of rigidity, no stretch discharge is elicited with or without this maneuver. All preoperative and postoperative patients who had incomplete alleviation of rigidity, stretch discharges were readily demonstrated by the contralateral movement. Electromyographical studies further substantiate this maneuver both for confirmation of the diagnosis as well as the evaluation of surgical results.

Pathophysiologic mechanism of this phenomenon would seem to be related with the central activation to gamma system, not due to proprioceptive input from the contralateral limbs. However, the precise role at the gamma system in reinforcement of rigidity by the contralateral maneuver is not yet certain.

57. Supplemental Findings on Huntington's Chorea

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In one group of patients with Huntington's Chorea, chorea movements are localized to a certain part of the body and do not spread to the entire body during the reminder of their lives. This type of Huntington's Chorea is called limited type (type L), and was first reported by Davenport. Recently, we experienced several cases of type L which appeared in the same family. We had questions such as the following.

1) What is the incidence of type L, compared with general type (type G) in which chorea movements spread to entire body?

2) What type of heredity does type L show?

A statistical observation was made by 311 cases with Huntington's Chorea reported in Japan. The results were obtained as following;

1) The general incidence of Huntington's Chorea is obviously lower in Japan than in other countries. However, the age of onset, the duration of the disease, and the average age of death due to the disease are same both in Japan and other countries.

2) If we examine the deceased cases in Japan, as in shown in the table, there is no difference in the age of onset, duration of the disease and the