to 50 V and 2 to 2.5 cps were applied. The evoked potentials were recorded from 24 to 48 needle electrodes inserted in the whole scalp with the indifferent electrode on the nose. Scalp electrodes were led to the ink-writing electroencephalogram, connected to the data recorder. The computer of average transients was used for analysis. Spacio-temporal maps were drawn.

1) Stimulation of either VL or DL produced the clear evoked potentials; the distribution of the maximal amplitude of the first negative-positive wave corresponds to the precentral motor cortex on the ipsilateral hemisphere. 2) DL stimulation produced the maximal potentials rather medially, while VL stimulation evoked the maximal potentials rather antero-laterally on the ipsilateral hemisphere.

The same study was performed on CM stimulation in four patients with intractable pain. Stimulation of the parvocellular portion did evoke potentials but not so high as to be able to make spacio-temporal maps, while that of the magnocellular portion produced the clear evoked potentials.

23. Evoked Scalp Responses Following Stimulation of Human Putamen

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Electrophysiological studies on scalp electroencephalogram, depth electroencephalogram, of putamen and evoked responses following stimulation of putamen were performed during putaminotomy for patients of epilepsy having the focus at the motor area and its neighbouring structure.

1) Spontaneous discharges of putamen were 8–10 cps. waves and 18–20 cps. waves.

2) Sometimes spike and wave discharges were recorded from depth electrodes in putamen with showing no spike and wave in scalp recording.

3) Electrophysiological characteristics of evoked scalp responses to stimulation of putamen were as follows:

- i) The response showed multiphasic waves.
- ii) The peak latency of the first negative wave was about 20 msec. and of the second negative wave was about 75 msec..
- iii) The responses were predominant in some specific frequency of stimulation in putamen (6–8–10 cps.).
- iv) The responses showed the patterns of waxing and waning in any frequency of the stimulation.
- v) In the contralateral recording, the responses with the same latency of the ipsilateral one were recorded but they had lower amplitude.

4) The change of averaged scalp responses was observed by taking out of stimulating electrode in human and in cat experimentally.

5) Important fact is that the projected area on cortex from anterior putamen is differed from that of posterior putamen. In other words, cortical projection from anterior putamen was mainly at the ipsilateral frontocentral part on the stimulation and that from posterior putamen was more posterolateral.