In 10 cases with intracranial lesion, EEG, ECG, respiration and systemic blood pressure were recorded simultaneously in their terminal stages, in which respiratory depression or arrest was produced by increased intracranial pressure. Comparing these records with clinical course and autopsy findings, the following results were obtained.

1) In 5 cases of supratentorial lesion, anisocoria, slightly increased systemic blood pressure and bradycardia appeared prior to respiratory arrest. In 3 autopsied cases marked cerebral swelling with transtentorial herniation was revealed. Patients had fallen into deep coma and EEG had become completely flat 20 minutes to 2 hours before respiration ceased. Any stimulus failed to improve clinical and EEG findings.

In this respect EEG flattening in comatose state is probably the prodromal sign of respiratory arrest in supratentorial lesion.

2) In 5 cases of infratentorial lesion, decreased systemic blood pressure, tachycardia and respiratory depression had been recognized long before respiration ceased. These results are contrast to the findings in supratentorial lesion. In all of four autopsied cases, tonsillar herniation were revealed macroscopically. Three cases of them showed tumors (two cases of medulloblastoma, one case of pontine glioblastoma) and another one case was subdural hematoma in posterior fossa. The invasion or compression by these lesions were observed markedly in brain stem.

In two case some electrical activity in EEG was preserved and consciousness remained untill the terminal stage, if respiration was maintained artificially.

Such a discrepancy in two groups may be explained as follows. Since in the supratentorial lesion cerebral function is disturbed primarily and respiratory arrest is caused secondarily by tentorial herniation in the final stage. Flat EEG may appear long before respiration ceases. On the contrary, infratentorial lesion may involve respiratory center, and result in respiratory depression or arrest preceding appearance of electrical silence in EEG.
3) In 17 dogs experimental study on acute extradural compression (balloon method) was performed. In supratentorial extradural compression, thalamic $pO_2$ began to decrease when the cisternal pressure reached to 30 mmHg or higher. EEG flattening appeared in the range of 50 to 70 mmHg, then respiration ceased. In acute infratentorial extradural compression, the almost same critical level was found for decrease in thalamic $pO_2$. However, cardiovascular failure and respiratory depression may appear prior to EEG flattening.

These results may suggest the close correlation between clinical findings and experimental data in respiratory arrest due to increased intracranial pressure.

68. Postoperative Management by Prolonged Hypothermia in Brain Operations (The Second Report)

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Since 1960, 110 cases of intracranial tumors, aneurysms and severe head injuries were operated on under moderate hypothermia between 28°C and 30°C.

The prolonged hypothermia was employed in these postoperative course. This was maintained by surface cooling and administration of lytic cocktail.

A group of cases was operated on under ether anesthesia and the other was under fluothane anesthesia.

After the operation it was easy to maintain hypothermia in ether group than fluothane group.

Disturbance of consciousness due to hypothermia itself was not so significant. So called "replied response" in soporous state could be recognized under 32°C in many cases.

This response is a sign to start rewarming.