47. Prolonged Cerebral Circulatory Interruption under Extremely Profounded Regional Hypothermia by means of Isolated Cerebral Vascular Irrigation

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48 adult dogs are used for this experimental study. At first surface cooling is used until body temperature falls to 30°C. Cerebral irrigation by means of about 0°C harmless isotonic solution (PVP Ringer's solution or PVP amino-acid solution) is done from one side of internal carotid artery to opposite side of external jugular vein with 130 mmHg pressure fluid level. Main vessels are all clamped and the connection of cerebral and body circulation is interrupted completely as possible. In this manner within 15 minutes brain temperature goes down to 6-7°C. 1-1½ hours after circulatory arrest all clamps of neck vessels are removed and cerebral blood flow is restarted. Cerebral temperature begins to rise gradually and surface warming is applied for complete returning to normal body temperature. In lapse of 5-6 hours after rewarming they become conscious and look around the surroundings and take a meal by their own accord.

This new technique is applied clinically—3 brain tumor cases are operated and 58 to 96 minutes cerebral circulatory arrest is done successfully. After rewarming these patients gain consciousness and obey simple command easily. No marked deficits of vitalities or mentalities are demonstrated. All cases are discharged uneventfully.

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47. Profounded Hypothermia with Use of Selective Brain Cooling

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We are reporting the experimental studies on selective brain cooling in dogs.

in which polarographic measurements are used as an indicator of the cerebral anoxia, and hematologic changes are searched for with reference to the combination of profound hypothermia and extracorporeal circulation.

Along with these works, we had recently an opportunity to use the selective brain cooling in a human case. The patient was 27 years old man, who had been suffering from bifrontal glioblastoma multiforme. The temperature of his brain was lowered down to 16.5°C within 30 minutes. Thereafter flow rate of extracorporeal circulation was reduced from 500 cc/min. to 100 cc/min., which was maintained throughout the procedure for four hours. During the procedure, however, the arterial inflow to the brain was completely occluded in three times, 20 minutes, 20 minutes and ten minutes, respectively. His rectal temperature was maintained above 31.5°C and no cardiac arrhythmia was found in E.C.G. It was surprising that the operative field was almost bloodless and no troubles were encountered. Soon after the operation, he recovered his consciousness.

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48. Hypothermia in Head Injuries

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49. Three Cured Cases of Severe Head Injuries with Treatment of Surgery and Hibernation

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In this paper, we discussed surgical treatment and artificial hibernation which cured 3 severe head injury cases.

Three cases were as follows: 1) K.M., female aged 37, had coma, fixed dilated pupils on both sides and her body temperature of 39°C 11 hours after head injury. Also she had melena on 15th posttraumatic day which suggested as having Cushing's ulcer on her stomach. 2) T.S., male aged 20, had an opened depressed fracture in the right frontal region which was suppurated later. On 8th post-traumatic day he became unconscious and had a fixed dilated pupil on the right. Also his body temperature had risen to 39.5°C on that day. 3) T. N., male aged