

57. Application of pressure decreasing drugs and their effects to the cerebral and pulmonary circulation.

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Since the original work of Weed and McKibben in 1919, many agents were used to reduce the CSFP in cerebral lesions. Recently Javid and Settlage reported a remarkable effect of urea.

The purpose of this report is to examine cerebral circulation and metabolism clinically and experimentally, when CSFP is decreased by the use of urea etc. Pulmonary circulating time was also measured.

Results:

- (1) Urea is most effective in reducing CSFP (over 50% in dogs).
 - (2) Dogs with intracranial bleeding show CBF below 50% and CMRO₂ below 10% of normal dogs.
 - (3) Pulmonary circulating time is 12" in normal dogs, 26.6" in dogs with intracranial bleeding and 16.7" after urea is used intravenously.
 - (4) It was also used clinically with success in head injuries and brain tumors.
- The above changes were observed as soon as intravenous injection started and lasted for about 10 minutes.

From the above mentioned results, it is thought that this striking reduction in intracranial pressure by hypertonic urea solution injection will result from 2 factors, namely diminution of cerebral blood flow and diminution of water content of the brain. In general, it seems that diminution of cerebral blood flow due to contraction of cerebral vessels precedes diminution of water content of the brain.

58. Experiences with ventriculocaval shunt operation in hydrocephalus.

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We introduced Dr. Spitz's sentriculocaval shunt operation with Holter valve for hydrocephalus. Operations on 2 communicating and 2 non-communicating hydrocephalus cases showed good results.

As a method of diagnosis of hydrocephalus, we used diffusion degrees of 0.4 W/V% Indigocarmine 1 cc which was injected into the right ventricle.

For analysis of Indigocarmine we used Hitachi's Beckman type electrophotometer. Indigocarmine has specific absorption peak of 340, 440 and 620 m μ . The peak of 620 m μ is most remarkable and has no influence on the specific absorption spectrum of CSF and urine. The spectrum remains in CSF and urine.

For quantitative analysis of Indigocarmine in bloody CSF or urine, it is

necessary to make the absorption spectrum of the specimen from 500 $m\mu$ to 700 $m\mu$.

As a result, the ventricle has a small absorption acuity of the dye which was excreted in urine. A small dosis of the dye goes into CSF of lumbar region (grossly clear CSF), 2 hours after ventricular injection in case of non-communicating hydrocephalus.

59. Experiences with ventriculo-auriculostomy.

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Six cases of congenital hydrocephalus, of which two were of communicating type and four were of non-communicating type, underwent ventriculoauriculostomy, all on the right side. The techniques were essentially the same as those reported by Pudenz et al. The silicon rubber tubing used by the authors was slightly different from that of Pudenz-Heyer. It consisted of the tip with the valve, 1.5 mm in inner diameter and 2.0 mm in outer diameter, and the major part of the tube, 1.5 mm in inner diameter and 2.5 mm in outer diameter. The valve consisted of a core, 1 cm in length, and two holes, 1 mm in diameter. The silicon rubber tubing which was inserted into the auricle through the facial and internal jugular veins were connected with polyethylene tube which was inserted into the ventricle.

The longest follow-up was only seven months. Evaluation of final results should await further observation. Up to the time of our report, however, the results were all good except in one case who, one month after the operation, died of generalized convulsions which he had repeated prior to the operation. Autopsy in this case revealed that the tubing was still patent.

60. Experimental studies on cerebrospinal fluid flow.

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61. Study on circulation of cerebrospinal fluid. II.

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The author reported previously that, when the cisterna magna and the lumbar