1. Ventricular tube must be inserted from the burr hole opened at the occipital region in the postero-anterior direction long enough through the lateral ventricle.
2. The flushing device must be applied to every case. We can not only put away various obstructors, but also we can know the point of obstruction. If return of the dome of the flushing device is incomplete, the point of obstruction is in the ventricular end. And if we feel resistance by compression of the dome, obstruction is in the cardiac end.
3. The cardiac tube must be fixed as higher as possible in the right atrium, in order to prevent the destruction of the tricuspid valve and the cardiac tube. In order to determine the length of the cardiac tube, we adopt the three indicators as follows;
 1. Chest X-Ray.
 2. EKG.
 3. Micro drip chamber.

To prevent skin necrosis over the tube or the flushing device, it is very important to close the operation wound with two layers. Protein anabolic hormone is effective in case of malnutrition.

21. Ventriculosagittal Sinus Shunt in Hydrocephalus

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A new type of the shunt operation was devised first by Paul C. Sharkery in 1964 for the chronic hydrocephalus by of Ventriculosagittal sinus shunt. The experience of this type of operation in 5 patients will be presented.

The shunting system consisted of ventricular tube, flushing device and Pudenz-Heyer tube and the right ventricle was tapped through a burr hole and ventricle tube was inserted into the ventricle and this was connected to the flushing device seated on the burr hole. Next, a small incision was made on the sagittal sinus through another burr hole and Pudenz-Heyer tube was inserted in the sinus towards lcm. distal to the confluens sinuum and this was connected to the flushing device.

The length of the venous tube was determined beforehand by measuring the distance between the expected first burr hole and the confluens sinuum in the X-ray film. Moreover, the tip of venous tube was adjusted during operation by using image intensifier.

The advantage of this technique compared with the ordinary ventriculo auricular shunt seemed to be 1) lesser displacement of tip of venous tube by neck movement or by growth of the body 2) no need of special check on heart during operation.

All 5 subjected patient under this technique had communicating hydrocephalus with high intracranial pressure. Postoperatively, these patients showed continuous effect of the shunting system and showed clinical improvement, i.e. lessened convulsion, spasticity in extremity, intracranial pressure, headache or better mental state, activeness and improved E.E.G. findings .

Complications such as mechanical failure, thrombosis or septicemia were not encountered in the series.

22. Experimental Studies on Blood in Subarachnoid Space

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A genesis of hydrocephalus following subarachnoid hemorrhages was experimentally studied. Autogenous whole blood, suspension of red blood cells plasma and hemolysed red blood cells were injected repeatedly in the cisterna magna of adult rabbits. Volumes or amounts injected were 1.3-2.0 cc. of whole blood, suspension of red blood cells washed from 1.5-2.0 cc. of whole blood 0.8-1.7 cc. of plasma, and hemolysed red blood cells acquired from 1.0-1.5 cc. of whole blood (washed in saline and hemolysed in distilled water). Intervals of injections were mostly 7-8 days but up to 21 days in some rabbits. Sacrifice and autopsy were done 7-20 days after the last injections. Dilatation of the cerebral ventricles was recognized with high incidence (7/9) only in the group of rabbit which received more than 3 times of injections of whole blood and not in ones of other groups. Hydrocephalus was of communicating type accompanied with widening of the aqueduct. Ferric iron reaction revealed hemosiderin-deposit in fibrosed or organized leptomeninges and in subpial layers of the basal cortex of the rabbits injected with whole blood or suspension of red blood cells. It is postulated that there must be clot formation and its organization in subarachnoid space which in turn requires fibroblastic reactions of the leptomeninges induced by irritant actions of some blood components. Intracisternally injected hemolysed red blood cells had peculiar effect; generalized convulsive seizures with opisthotonus and tonic extensions of all extremities were observed at or some seconds after the injection. These convulsive seizures often resulted in acute death or extreme emaciation of the animals. In this respect, it seems very important whether