Neurosurgical Techniques
Third Ventriculostomy by Puncture of the Lamina Terminalis and the Floor of Third Ventricle

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Historical Note

SUCCESSFUL treatment of obstructive hydrocephalus demands that the cerebral spinal fluid from within obstructed ventricles be drained into the subarachnoid system whence it can be resorbed into the blood stream by natural physiologic processes. This basic principle was first clearly stated in 1922 by Walter Dandy.¹

Third ventriculostomy, as originally conceived by Dandy, fulfills in a nearly ideal manner his theoretical requirement for the rational treatment of obstructive hydrocephalus, namely: (1) The cerebrospinal fluid from both lateral and 3rd ventricles is drained directly into a large subarachnoid space, the interpeduncular cistern; (2) The interpeduncular cistern cannot collapse or become obliterated for it has the support of the cerebral peduncles on each side of it; (3) The ventricular fluid can escape from the interpeduncular cistern into the sulci that lead out over the surfaces of the cerebral hemispheres, whence it can be absorbed by natural physiologic processes; (4) The opening is made through the almost paper-thin floor of the 3rd ventricle where chances of later closure by tissue growth are minimal.

The first third ventriculostomy was performed by Dandy¹ in 1922 and described by him in a very brief, unillustrated report. Following is Dandy's verbatim description of that operation:

"... a procedure which apparently is anatomically correct has been devised. ... This consists in removing the floor of the third ventricle. A small opening is made in the skull and dura in the frontal region, the frontal lobe is elevated until the bulging third ventricle is well exposed. Usually, it is necessary to divide one of the optic nerves, for in hydrocephalus these nerves are very short; usually the chiasm lies directly on the anterior border of the sella turcica. This opening in the floor of the third ventricle affords an exit from the dilated ventricles, so that the fluid can now pass directly into the cisterna chiasmatis and interpeduncularis—the normal distributing centers for cerebrospinal fluid. ... We have employed this method 6 times. No claim is made for its success. ..."

Unfortunately, Dandy's original operation was technically unsatisfactory and he eventually abandoned it.²

In 1933, however, Dandy³ described a new technique for third ventriculostomy using a lateral (subtemporal) approach to the interpeduncular cistern and 3rd ventricle, the principal features of which are shown in Fig. 1. The original description of the new technique was unaccompanied by any case reports or statistical data. This technique apparently proved satisfactory in Dandy's hands and was the method that he employed thenceforth for the treatment of obstructive hydrocephalus. In 1945 Dandy² published a comprehensive report of 92 cases which he had treated by this operation, with a 12 per cent mortality, and arrest of hydrocephalus in 50 per cent of the cases for periods of time ranging from 6 months to 23 years, the average survival time being between 7 and 8 years. Since 1945 only Voris⁸ has reported using Dandy's lateral approach to perform third ventriculostomy; he has reported 10 cases, with no operative mortality and with arrest of hydrocephalus in all 10 cases followed for an average period of 2 years.

In 1936 Stookey and Scarff⁷ described a technique for third ventriculostomy performed through an anterior (subfrontal) approach, namely, puncture of the lamina terminalis and floor of the 3rd ventricle. The