VENTRICULOMASTOIDOSTOMY
TECHNIQUE AND OBSERVATIONS

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In idiopathic congenital communicating hydrocephalus or in the progressive hydrocephalus secondary to a purulent meningitis, the existing imbalance between the production and absorption of the cerebrospinal fluid may impose an almost insurmountable problem in the control of the intracranial pressure. In an historical review of the subject one is impressed with the number and variety of surgical schemes that have been proposed to correct this unhappy clinical situation. Though, in some instances, great ingenuity has been demonstrated in the effort to solve the problem, each newly proposed surgical measure has met with a degree of failure unique unto itself. To this imposing list I should like to add another procedure which, in spite of its fault, has been effectively used as a palliative measure—the ventriculomastoidostomy, wherein the ultimate step of external drainage of cerebrospinal fluid has been taken.

In this procedure, first performed on March 28, 1947, an attempt is made to establish a pathway from the lateral ventricle into the antrum of the mastoid through a polyethylene tube to which a special tantalum tip has been affixed. The fluid passes from the ventricle into the antrum of the mastoid, through the atrium and then drains via the Eustachian tube into the nasopharynx (Fig. 1 C).

While the thought of an open pathway from the ventricle to the nasopharynx is abhorrent to neurosurgeons, it is believed that the presence of a constant higher intracranial pressure as well as the normal movement of the Eustachian tube cilia results in an undirectional flow of fluid in an outward direction to decrease the risk of retrograde infection. A limited clinical experience appears to bear out this statement.

Because of its simplicity this operation may have some interest in a clinical application. There is presented here an outline of the surgical technique.

TECHNIQUE

1. In the selected patient x-ray study is made to determine the degree of pneumatization of the mastoid cells, which if inadequate will preclude the establishment of a free channel.
2. The ear is checked to eliminate the possibility of infection.
3. The ear and temporomastoid area (usually right side) are prepared for surgery, and under general anesthesia a curvilinear incision, 6–7 cm. long, is made above and behind the ear (Fig. 1 A).

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Fig. 1. (A) Placement of incision. (B) Appearance of operative area with plastic tube and tantalum tip in place. (C) Schematic drawing demonstrating relations of drainage tube and ventricle.

4. A trephine opening is made through the temporal bone to expose the posterior portion of the middle fossa. The mastoid is not opened.

5. The dura is stripped from the petrous portion of the temporal bone on the dorsal surface to a point medial to the superior arcuate eminence.

6. To locate the antrum of the mastoid a bright Cameron light is introduced into the ear canal. The antrum transilluminates with greater intensity than does the surrounding structure.

7. The antrum is punctured with a dental probe and the edges of the punctate opening cauterized carefully. Any residual blood in the antrum cell must be carefully removed. The dura directly over the antral puncture is then cauterized at this point and a small opening made to admit the plastic tubing.

8. A piece of polyethylene tubing, 5–6 cm. long, having an inside diameter of 1 mm., is tightly affixed to a prepared tantalum tip (Fig. 2). A curved stylet is introduced into the tube and the tube inserted into the temporal horn of the lateral ventricle, the stylet then being withdrawn. A free flow of clear fluid must be obtained.

9. The tantalum tip is then inserted into the previously made puncture-hole in the antrum and tightly anchored by pressing the prongs into the petrous bone. Gelfoam pads may be placed about the tip and the brain re-expanded with saline solution (Fig. 1 B).