A Simplified Technique for Performing the Ventriculo-Peritoneal Shunt

Technical Note

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We have found that the use of the Pudenz-Heyer valve with a ventriculo-peritoneal shunt provides the most favorable method of treatment for congenital and acquired hydrocephalus. The simple ventriculo-peritoneal shunt was prone to early malfunction because of the insinuation of omentum into the distal end of the tubing. For this reason, ventriculo-caval and ventriculo-atrial shunts have been generally adopted.

The Pudenz-Heyer shunting device has a leaf valve at the distal end of the tubular system. This valve remains closed at all times except when fluid is passing outward, thus preventing omentum from gaining access to the tubular system. Consequently, we chose to perform ventriculo-peritoneal shunts when confronted with the problem of a child who already had one internal and two external jugular veins thrombosed from previous ventriculo-venous shunts. Our results in these cases proved so favorable that we ultimately made it our practice to use this method as a matter of routine.

Although the technique of establishing a ventriculo-peritoneal shunt is relatively simple in an adult, the application to a newborn or premature child is more complicated. The problems of general anesthesia in the newborn add to the difficulties.

We are reporting our simplified technique for performing the ventriculo-peritoneal shunt under local anesthesia. Our experience includes 67 procedures performed on 62 newborn children and 5 adults, for either congenital or acquired hydrocephalus of either the communicating or the obstructive varieties.

Instruments

The instruments consist of a ½-inch twist drill, two special thin-walled needles, and one special malleable guide. One of the needles is used for insertion into the lateral ventricle and the other is for the abdominal puncture (Fig. 1). Both needles are ½ inch in diameter and have a lumen large enough to permit the passage of the Pudenz tubing. The malleable guide has a blunt tip, a handle, and a locking device at the distal end for the connecting tubing.

Technique

The pre-medication used is a mixture of Demerol, Phenergan, and Sparine, given

![Diagram of instruments used in Pudenz-Heyer ventriculo-peritoneal shunt](image)

FIG. 1. Schematic drawing of the instruments used in the Pudenz-Heyer ventriculo-peritoneal shunt. The ventricular and peritoneal needles permit the surgeon to guide the tubing along either a straight or curved line. The guide handle has a lock which, when turned, fixes it to the malleable subcutaneous guide. The tubing is slipped over the distal end of the malleable guide and thereby remains firmly fixed.

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parenterally approximately 45 minutes before surgery. The dosage is shown in Table 1.

Linear incisions, each measuring approximately 2 cm, are made: 1) over McBurney's point on the left, 2) in the left supra-clavicular fossa, and 3) just postero-inferior to the left parietal eminence. The abdominal needle is then inserted into the peritoneal cavity (exactly as an abdominal trocar is inserted) and left in position. The subcutaneous space, extending from the abdominal incision to the scalp incision, is infiltrated with normal saline so as to create a track along which the guide may be passed. This facilitates the passing of the guide and minimizes the possibilities of damaging the subcutaneous tissue. The malleable guide is passed along this track from the abdominal incision to the scalp incision. Since the curve in the track at the supra-clavicular fossa is quite sharp, it is advisable to bring the malleable guide out of the subcutaneous space at this point, and to reinsert it before threading it subcutaneously up to the scalp incision. The connecting tubing, which should previously have been attached to the locking device on the distal end of the malleable guide, is thus brought from the abdominal to the scalp incisions and left in the subcutaneous space (Fig. 2).

### Table 1

Premedication for the ventriculo-peritoneal shunt (intramuscular injection given 45 minutes before surgery)

<table>
<thead>
<tr>
<th>Patient's Body Weight (lbs)</th>
<th>Demerol (Meperidine) (mg)</th>
<th>Phenergan (Promethazine) Hydrochloride (mg)</th>
<th>Sparine (Promazine Hydrochloride) (mg)</th>
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Fig. 2. The peritoneal needle (single arrow, lower left) is shown after it has been inserted into the free peritoneal cavity at McBurney's point on the left. Bulging, caused by the subcutaneous saline infiltration which eases the passing of the guide, is seen along a line extending from this needle beneath the nipple to the exit of the tubing just above the clavicle. The guide should be removed at the supra-clavicular space and reinserted for passage to the area of the burr hole. It is then pulled through at the site of the scalp incision (double arrows, upper right).