Cervical-peritoneal shunt in the treatment of pseudotumor cerebri

Technical note

ROBERT A. BEATTY, M.D.

Department of Neurosurgery, University of Illinois College of Medicine, Chicago, Illinois

Symptoms of pseudotumor cerebri usually resolve spontaneously. However, some patients develop papilledema serious enough to threaten useful vision. Early neurosurgeons treated these patients by bilateral subtemporal decompression, an operation which has been generally abandoned. Serial lumbar punctures, diuretics, and steroids have been used with varying success. In 1955, Jackson and Snodgrass reported a series of 10 patients who were successfully treated by lumboperitoneal shunts. Since then, other neurosurgeons have reported good results using variations of lumboperitoneal shunting.

Because 80% to 90% of these patients are obese young women (average weight of 177 lb in one series of 48 patients), technical problems are encountered when trying to determine if a shunt, buried in several inches of adipose tissue, is functioning. One approach to evaluating lumboperitoneal shunts has been to determine if technetium-99m injected into the cervical subarachnoid space can be seen on a scan of the abdomen. A possible solution to this problem is described, with a case illustrating its use.

Technique

The patient was placed in the lateral position with the right side uppermost and the head resting on a Mayfield cerebellar headrest (Fig. 1 inset). A midline cervical incision was made over C-1 and C-2, and a...
right-sided reflection of the paraspinal muscles was carried out. After hemilaminectomy of C-2 was completed, the dura was opened, and a 3-cm length of shunt tubing with a single hole on the end was passed caudal within the subarachnoid space, anterior to the dentate ligament. The dura was tightly closed around the tube, and the cephalad end of the tube was brought up, with some slack to allow for head motion, to a U-shaped incision just to the right of the occipital midline. Here, it was attached to a flat Pudenz pump by means of a right-angled connector (Fig. 1). The right upper abdominal quadrant was perforated with an abdominal trocar, and 20 cm of a medium-pressure slit valve spring catheter was passed into the peritoneal cavity. The cephalad end of the tubing was passed subcutaneously along the right anterior chest wall into the occipital wound where it was attached to the pump with another right-angled connector.

Case Report

In January, 1979, this 28-year-old woman, height 5 ft 4 in. and weight 185 lb, developed recurring bitemporal headaches associated with an enlarged right central blind spot. Over the next year, she experienced a rushing sound in the ears, loss of equilibrium, and mental confusion.

Examination. In February, 1980, she was found to have papilledema, an otherwise normal neurological examination, a cerebrospinal fluid (CSF) pressure of 400 mm H2O at lumbar puncture, and a normal computerized tomography (CT) head scan. Visual acuity was 20/20 bilaterally, but visual fields were constricted. She was treated with acetazolamide, 500 mg four times a day, and prednisone, 80 mg daily. In December, 1980, she discontinued the medications because her vision had returned to normal.

First Admission. In March, 1981, the patient was admitted to the Hinsdale Hospital because of failing vision and headaches, in spite of resuming large doses of acetazolamide and prednisone. Visual fields were again constricted, and useful vision was limited to finger counting. The CSF pressure measured at lumbar puncture was 250 mm H2O.

On March 20, 1981, a lumboperitoneal shunt with a medium-pressure slit valve was placed in the peritoneal cavity; no pump was included in the shunt. After surgery, her headaches disappeared and her vision returned to 20/20 within a week.

Second Admission. Six weeks later, she was readmitted to the hospital with severe headaches, blurred vision, and constricted visual fields. It was postulated that the shunt had become disconnected when her husband allegedly threw her to the floor during a quarrel. Lumbar puncture showed CSF pressure of 510 mm H2O. A CT scan of the head again demonstrated slit ventricles. An isotope study with ytterbium-169 injected into the lumbar subarachnoid space showed no activity in the abdomen. On May 18, 1981, she underwent placement of a cervical-peritoneal shunt. The lumboperitoneal shunt was left in place.

Postoperative Course. Over the past year, her visual fields have returned to normal. The pump is easily palpable and is functioning. In September, 1981, she underwent laparotomy for pelvic inflammatory disease. At surgery, the lumboperitoneal shunt was found not to be working and was removed. Pressure on the occipital pump produced an observable squirt of fluid from the cervical-peritoneal shunt into the peritoneal cavity.

Discussion

A discussion of the causes of pseudotumor cerebri is beyond the scope of this paper. However, current thinking regarding these causes suggests that the common denominator is an excess of CSF volume in relation to the ability of the body to absorb CSF.2,6,7 It follows that, in refractory cases, some sort of CSF shunting procedure might logically be done. Other recently reported techniques, with acceptable results, are venous bypass between one of the lateral venous sinuses and the external jugular vein in a patient with thrombosis of both lateral sinuses,8 and excision of the optic nerve dura.8 Both of these techniques have limited applicability and, in the case of optic nerve decompression, no beneficial influence on the increased intracranial pressure.8

Other surgeons have recognized the desirability of including a pump in lumboperitoneal shunts. Benini1 placed a flat Misher valve over the sacrospinalis muscle, and Dakters, et al.,9 fixed a Holter valve against the 11th or 12th ribs. However, since the majority of pseudotumor patients are obese young women, these pumps would not be palpable. The present paper describes a shunting operation which is effective and which can be directly evaluated by palpation.

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References


R. A. Beatty

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Address reprint requests to: Robert A. Beatty, M.D., 40 South Clay Street, Hinsdale, Illinois 60521.