Hydrocephalus and dementia complicating spinal tumor

Case report

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Hydrocephalus and dementia associated with spinal mass lesions are well recognized. Removal of the spinal mass has sometimes resulted in relief of the dementia. This case demonstrates that the ventricular size may also become smaller after removal of the spinal mass.

Key Words • hydrocephalus • dementia • spinal tumor

HYDROCEPHALUS associated with spinal tumors is a well known but uncommon phenomenon. Over 50 such cases are reported in the neurosurgical literature, and in several of these, hydrocephalus was documented by pneumoencephalography preoperatively. In some cases, mentation improved after resection of the spinal cord lesion, but we found no case where removal of the tumor was documented to result in a reduction of the ventricular size.

Case Report

This 73-year-old woman was first admitted to the medical service of the Wayne County General Hospital on September 6, 1978, because she was confused and had stopped eating. She was unable to sit or stand, and had been urinating and defecating on the floor at home. She gave a history of “arthritis” of her legs with difficulty in walking for “some time,” and this problem had been treated with acetaminophen. She had been treated for back pain in April, 1975. She also had a long history of severe hearing loss, with unsatisfactory attempts to use a hearing aid.

Examination. Her blood pressure was 154/90 mm Hg, temperature 99.4°F, and respirations 20/min. She was very hard of hearing, in no acute distress, but with a somewhat vacant expression. The skin was very dry with decreased turgor. There was an abrasion on her right elbow. She was oriented to person, and aware that she was at Wayne County General Hospital, but did not know the month. She knew that Mr. Carter was president, but did not know the names of the governor of Michigan or the mayor of Detroit. She gave concrete interpretations of proverbs, and was unable to handle similes. No abnormalities were found on sensory examination to pinprick. She would not cooperate for strength testing, but did move all four extremities well.

She had a negative technetium brain scan and negative skull films. Abdominal films showed a distended bladder. A lumbar puncture revealed xanthochromic cerebrospinal fluid (CSF) with an opening pressure of 340 mm Hg, no red blood cells, no white blood cells, a total protein level of 1200 mg%, and a glucose content of 90 mg/100 ml. Blood glucose measured 138 mg/100 ml. Smear for acid-fast bacilli was negative; cultures were tested for fungus and pyogenic organisms, and were subsequently reported as negative also. A urinary residual of greater than 500 cc was found.

Spine films showed pedicle destruction at L-1, and severe posterior vertebral body erosion (Fig. 1). Computerized tomography (CT) scan showed large ventricles (Fig. 2).

Neurological consultation was obtained on September 13, 1978, because it was thought that the
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increased CSF protein, hydrocephalus, and dementia could be caused by a spinal cord tumor. Although no café-au-lait areas were seen, it was considered that bilateral acoustic neurinomas resulting in hearing loss might also be present. A myelogram performed on September 15 showed a very large intradural tumor at T12-L1 (Fig. 3).

Operation. On September 20, laminectomy was performed, with total excision of a very large thoracolumbar tumor, which appeared grossly to be a schwannoma. This diagnosis was confirmed on histological examination.

Postoperative Course. There was no obvious increase in weakness in her lower extremities. The patient was at first not mentally competent to test for sensory disturbance. She had some transient CSF accumulation in the subcutaneous spaces postoperatively. One episode of pulmonary embolism was successfully managed. She was transferred to a nursing home in very good condition, except for the expected infirmities of her age. She was mentally clear at the time of transfer, but still required a catheter, and had some fecal incontinence.

The patient was last seen in the neurosurgery clinic on August 27, 1979, when she was walking well with a cane. At that time, she was mentally very clear, had totally recovered from her mental disability, and had no urinary or fecal incontinence. Her hearing had not improved, but acoustic schwannomas had been ruled out by ear, nose, and throat evaluations. She felt completely recovered. Follow-up CT scan on July 24, 1979, showed much smaller ventricles than preoperatively (Fig. 4).

Discussion

At least 51 cases of spinal tumor associated with papilledema and/or hydrocephalus can be found in the literature. Ucar, et al.,7 reviewed the literature in 1976, found 44 such cases, and added two of their own. One of their patients had a nonresectable astrocytoma

Fig. 1. Left: Anteroposterior thoracolumbar spine film showing absent pedicles of L-1. Right: Lateral view showing marked posterior erosion with scalloping of the same area.

Fig. 2. Computerized tomography scan of the brain on September 12, 1978, showing very large, symmetrically dilated lateral ventricles. Periventricular edema is present, especially about the frontal horns.
of C4–7. She improved symptomatically after a Holter shunt. Their other patient had an angioblastic meningioma at C7–T1. She had bilateral papilledema. After resection of the tumor, “the patient recovered completely, the motor deficit and papilledema regressed totally, although she only partially recovered her vision.” One year later, she returned because of headache, and a pneumoencephalogram “showed a discrete bilateral and symmetrical hydrocephalus. The symptoms regressed with the administration of corticoids and acetazolamide.” Five years later, she still complained of sporadic headaches, but had a normal intellectual level.

Not included in the review of Ucar, et al., are two cases with hydrocephalus and ependymomas of the cauda equina, reported by Winklemann in 1975. In neither case was there a postoperative follow-up study of the ventricular size.

More recent reports include one in 1975 by Bamford and Labadie of an elderly demented man with hydrocephalus and an “asymptomatic” cauda equina neurilemmoma. His mental status had “dramatically improved” 6 weeks after removal of the tumor, but no follow-up pneumoencephalogram was done. Clinically, this case very closely resembles ours.

Rosset et al. reported one case of a T-11 “neuroma” with papilledema. His patient had a normal CSF protein, but very high pressure. No follow-up study of postoperative ventricular size was given.

In 1978, Luxon and Harrison reported a cervical neurilemmoma in a 67-year-old man with papilledema. This patient had two subarachnoid hemorrhages, and the authors suggested that the bleeding may have contributed to the raised intracranial pressure. Two preoperative CT scans revealed ventricles of normal size. Papilledema resolved in each instance, once with dexamethasone, and once spontaneously.

Of the earlier cases managed before the advent of CT, none had postoperative pneumoencephalograms to document a reduction in the size of the ventricles after the spinal tumor was removed. This is one of the patients reported by Gibberd, et al., whose papilledema and mentation improved after an ependymoma was removed. Arseni and Maretsis reported three spinal tumors (ependymomas) with papilledema. Two patients had preoperative pneumoencephalograms that showed hydrocephalus, and although they both had clinical relief of increased pressure after surgery, no subsequent pneumoencephalograms were done. Raynor reported a similar case due to a large vascular malformation in the thoracolumbar region. Ventriculography showed “all ventricles, including the fourth, were well outlined and were noted to be moderately enlarged but not displaced.” Postopera-
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demonstrated that the ventricles actually became smaller. Our patient provides such proof. Not only did her dementia clear completely, but postoperative CT scanning demonstrated a reduction in size of the ventricles.

References


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