Surgical drainage of cyst of the conus medullaris

Report of three cases

DONALD H. STEWART, JR., M.D., ROBERT B. KING, M.D.,
AND HERBERT LOURIE, M.D.

Department of Neurosurgery, State University of New York, Upstate Medical Center,
and the Neurosurgical Service, Syracuse Memorial Hospital, Syracuse, New York

NON-NEOPLASTIC cystic lesions of the spinal cord are uncommon and those involving primarily the conus medullaris are particularly unusual as judged by the infrequency of their citation in the literature. This communication adds three additional cases and describes a simple procedure which has proved successful in the treatment of this condition.

Case Reports

Case 1

A 35-year-old white woman was admitted to the Orthopedic Service in June, 1966, with a complaint of numbness and tingling in the left leg of 2 months’ duration. The numbness had begun along the lateral aspect of the foot and leg and later was followed by progressively increasing pain and weakness in the legs. Pain increased with activity or coughing, and was somewhat relieved at night or with bed rest. She had noted mild urinary incontinence during the week prior to admission. Past history was benign; in particular there was no history of back injury. She had been aware of relatively poor vision in the right eye for as long as she could remember.

Examination. The general physical examination was entirely normal but for diminished vision in the right eye. Weakness preceded evaluation of gait; it was marked in both legs, more marked in the left and more marked distally. Hypalgesia and hypesthesia were present bilaterally from the T-9 through L-2 dermatomes. There was impairment of vibratory and position sense in the left toes. The patellar reflex was brisk bilaterally, the right ankle jerk was normal, but the left was absent. The plantar response was flexor, and there was no umbilical-shift sign. There was diminished tone and strength in the anal sphincter. X-rays of the chest and thoracic and lumbar spine were interpreted as normal. Lumbar myelography demonstrated a complete block at T-12 with evidence of an intra-medullary mass at the level of the conus medullaris; spinal fluid protein obtained at that examination was 29 mg%.

Operation. Surgical exploration revealed the conus and proximal filum terminale to be symmetrically distended. The spinal cord immediately above the conus appeared grossly normal. Aspiration of the distended area of the conus produced crystal-clear fluid which on cytologic examination revealed no tumor cells. Protein content of the fluid was 10 mg%. Permanent drainage of the cystic lesion was instituted with a siliconized rubber catheter (see technique under “Discussion”).

Postoperative Course. Neurological follow-up 30 months later revealed no abnormality save for a slightly tight left heel cord.
Cyst of conus medullaris

The ankle jerk and sensation have returned to normal.

Case 2

This 17-year-old boy was admitted to the Neurosurgical Service in January, 1966, with a 6-month history of pain in the hips and thighs, and a feeling of heaviness and weakness in the legs. Symptoms increased with activity, but after a period of bed rest both the pain and the weakness seemed considerably improved. There were no symptoms of sphincter dysfunction. Since the age of 6 years he had been followed regularly by the Orthopedic Service for a slowly progressive but otherwise asymptomatic kyphoscoliosis.

Examination. The general physical examination was unremarkable save for kyphoscoliosis and a small cafe-au-lait spot on the shoulder. There was no nystagmus. The cranial nerves and gait were normal. He stood well in the Romberg position. There was mild atrophy and weakness in the dorsiflexors of the feet and toes bilaterally. No fasciculations were present. Sensation was intact except for inability to perceive vibration in the left hallux. Deep tendon reflexes were absent at the ankles, and at all other levels were symmetrically hypoactive. There were no pathologic reflexes. Skull films were normal. Cervical spine films demonstrated a wide anteroposterior diameter of the spinal canal. The thoracolumbar films confirmed a moderate kyphoscoliosis. Mild scalloping was present at T-12. Myelography demonstrated a capacious spinal canal, most evident in cervical and lumbar segments. There was a partial block at the level of the conus medullaris (Fig. 1).

Operation. A thoracolumbar laminectomy demonstrated a symmetrical slight dilatation of the lower cord, more evident at the conus medullaris. Aspiration of the conus produced crystal-clear fluid, which following withdrawal of the needle was noted to escape through the needle tract in small squirts with each pulsation. A small myelotomy in the conus was used to insert catheter drainage. Cytological examination of the fluid was normal, and the protein content was 36 mg%.

Postoperative Course. One month postoperative the ankle reflexes had returned, and strength was normal. The patient has maintained this normal neurological state over the past 3 years.

Case 3

This 73-year-old man developed aching pain in the left hip 3 months prior to admission. Weakness and later numbness of the legs necessitated use of a cane, but there was no bladder dysfunction. As a young adult a mild back injury had required bed rest for 3 days. Five years prior to the onset of the present problem the patient had suffered a stroke-like episode, with unconsciousness, neck pain, and transient leg weakness. He was indefinite on the details of this weakness, but thought he had made a complete recovery.

Examination. The gait was broad-based and unsteady. A marked paraparesis was present, more marked distally. Hypalgesia and hypesthesia involving all lumbar derma-
D. H. Stewart, Jr., Robert B. King and Herbert Lourie
tomes were evident; sacral sensation was normal. Temperature discrimination was
poor in a stocking distribution. Gross position sense was retained in the toes, but vibra-
tion was not perceived below the iliac crests. The tendon reflexes were everywhere physi-
ological save for hyporeflexia at the left patellar and Achilles levels. Anal sphincter tone
was poor. Scalloping of the T-12 and L-1 segments was evident on plain films. My-
elography demonstrated a total block at the first lumbar interspace (Fig. 2). The CSF
protein was 41 mg%.

Operation. Laminectomy revealed a dis-
tended conus medullaris. Aspiration of the conus produced 2.5 cc of colorless fluid. A
small myelotomy allowed inspection of a central cystic cavity within the conus, the
wall of which was smooth and slightly yellow in color. No tumor nor mass was seen. The
end of a siliconized rubber catheter was fixed in the cystic cavity by suturing to the thick-
ened pia of the conus. Protein content of this cystic fluid was 226 mg%; cytological study
revealed no cells.

Postoperative Course. Considerable im-
provement in motor and sensory loss fol-
lowed surgery, and at the time of discharge
20 days later he walked easily with a single
cane. He required use of a bladder cathe-
ter postoperatively and although he was rectally
continent, anal tone was poor. Twenty-one
months later there was still distal weakness
in the legs, but the functional capacity was
quite adequate for daily activities.

Discussion

Signs and Symptoms

Each of these cases presented symptoms
and signs of progressive neurological deficit
occurring over a period of 6 months or less.
In Case 1, there were no historical findings
or chronic x-ray changes to suggest a long-
standing process. In Case 2, a family history
suggested the possibility of the formes fruste
of Von Recklinghausen's disease, and there
were x-ray changes of generalized spinal ca-
nal enlargement. The latter, the kyphosco-
liosis, and the single cafe-au-lait spot, are all
accepted stigmata of the formes fruste of
Von Recklinghausen's disease. The mild
scalloping at T-12 suggested the conus had
been chronically enlarged. The fact that the

Fig. 2. Case 3. Myelograms demonstrate the block. Note the tongue-like projection of contrast column
superiorly beneath the defect of the distended conus.
Cyst of conus medullaris

neurological deficit in the legs was symptomatically more evident at the end of a day suggested that an increase in the hydrostatic pressure in this part of a dilated central canal was responsible for the relatively greater enlargement of the conus and its impaired neurological function. In Case 3, the past history suggesting a subarachnoid hemorrhage 5 years previously, the more evident vascular dilatation over the conus, and the high protein in the aspirate of the cyst of the conus probably indicate that the pathogenesis was different from that in Cases 1 and 2.

In all three cases it can be safely presumed that the neurological deficit was in large part related to the pressure produced on the surrounding neural tissue by the cystic cavity in the conus. There has been no consensus in the literature favoring tube drainage of such cavities as opposed to a simple myelotomy or aspiration as the more advantageous treatment of cystic lesions of the spine, but there are cases in which dislodgement of the drainage tube resulted in rapid worsening of the neurologic status. The three cases described by Nassar, et al., were treated by simple incision of the cystic cavity, apparently with sustained neurologic improvement. Our experience in previous cases of cervical hydromyelia led us to believe that some permanent method of drainage held distinct advantage over simple aspiration of myelotomy.

Surgical Procedure

Our cases were treated by an intradural exploration and an initial needle puncture of the cystic lesion. Fluid aspirated was saved for chemical and cytological study. A small slit was made in the inferior part of the conus, or if the ilium terminale could be identified with certainty, it was used as the site of the myelotomy. Through this tiny myelotomy 1 to 2 cm of a siliconized tube (the same as that used for the ventricular catheter in a ventriculojugular shunt) were inserted into the cyst. If possible, the tube was affixed to the adjacent arachnoid with a

Fig. 3. Artist's conception of surgical exposure and method of tube drainage.
single fine suture passed through the wall of the tubing. In addition a 4–0 silk suture was passed through the wall of the tube and then brought out a few millimeters superior to the myelotomy on each side through the still open dural leaves. Once the dura was closed watertight, the ends of this transfixing suture were tied down. The purpose of the latter step was to prevent dislocation of the catheter. It is presumed that fixing the catheter in such a manner will allow it to act as a strut, maintaining the myelotomy lips permanently open and allowing for the escape of fluid around this strut should the lumen of the tube become obstructed (Fig. 3).

Summary

Three cases of non-neoplastic cystic lesions involving the conus medullaris have been described. The possible causes of such lesions are discussed and a method affording permanent drainage of the cystic lesion described.

References


Received for publication June 2, 1969.
Supported in part by Training Grant NB-05605 from the Institute of Neurological Diseases and Blindness, National Institutes Of Health, Bethesda, Maryland.
Dr. Stewart's present address: Box 5181, Wright-Patterson Air Force Base Hospital, Wright-Patterson Air Force Base, Ohio 45433.
Address reprint requests to: Herbert Lourie, M.D., Department of Neurosurgery. 750 East Adams Street, Syracuse, New York 13210.