Spinal Adhesive Arachnoiditis with Cyst Formation: Injection of Cyst During Myelography

Case Report

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In 1903 Spiller, et al., 10 were the first to report the successful surgical treatment of a patient with an intradural cyst compressing the spinal cord. Skoog9 reported two similar cases, emphasizing their uncommon occurrence when the condition was non-parasitic. Horsley5 presented a series of 21 operated cases of chronic spinal meningitis of unknown etiology, but he did not find any recognizable cyst formation. Later, Elkington noted that actual fluid-containing cysts accompanied spinal arachnoidal adhesions in 18 of 41 (44%) operated cases. He also observed that the fluid in the cyst was usually under sufficient pressure to produce a depression on the surface of the cord.

We are reporting a case in which adhesive arachnoiditis with an associated cyst could not be differentiated clinically from a spinal cord tumor.

Case Report

This 64-year-old Negro woman was well until 7 years before hospital admission when her left leg and then the right leg developed rapidly progressive weakness. Within 1 year she was no longer able to walk and had lost control of bladder and bowel functions. She remained in this condition for almost 6 years until she fell while being transferred to a wheelchair, fracturing her right tibia and fibula.

Examination. The patient’s mental state and orientation were normal. Cranial nerves were intact. There was marked weakness in both legs, greater on the left; deep tendon reflexes were diminished in both legs. Sensory examination showed loss of perception of heat, cold, and pinprick below D-12, but light touch, pressure, and position senses remained intact. There were flexion contractures of the right hip and left knee, and marked muscular atrophy of both legs.

The myelogram was interpreted as showing good delineation of the lumbar and lower thoracic spinal canal with complete obstruction at the level of the D-9 interspace. A smooth conical termination of the contrast column on tilting (Fig. 1) was not thought typical of an extradural or intradural lesion. The only abnormality in the cerebrospinal fluid was the presence of a moderate number of red cells. Hemoglobin values ranged from 9 to 13 gm% but were confused by transfusions; no other hematological abnormalities were detected. Serum iron and albumin levels were markedly decreased. Serology was negative. The urine culture was positive for several organisms.

During hospitalization the patient developed large decubitus ulcers over the hips and sacrum. Gradual deterioration occurred over a few months, and the patient died.

Autopsy Findings. Examination of the brain and spinal cord showed mild athero-

Fig. 1. Myelograms demonstrating cyst filled with contrast medium but originally interpreted as a block in the subarachnoid. Left: leg-down tilt position. Right: head-down tilt position. Note the smooth outlines and concentration of dye in the dependent portions of the cyst on tilting.
sclerosis of the cerebral vessels, but no significant gross change in the brain. The spinal cord was removed in its entirety through an anterior approach; the dura was normal. On the left posterolateral side (Fig. 2) of the lumbo-sacral portion of the cord, there was a 5-cm long, fusiform, cystic swelling; it contained clear, watery fluid. Fibrous arachnoidal adhesions covered the cyst, adjacent spinal cord, and cauda equina. The involved segments were markedly softened.

After fixation, the spinal cord was serially sectioned throughout its length. The cervical and thoracic regions were normal. There was a unilocular cyst between thickened leptomeninges and the compressed spinal cord on the left side at the lumbo-sacral level (Fig. 3). Part of the lumbar portion and the entire sacral portion of the cord was narrowed due to compression by the cyst. At its lower end, the cyst had extended into the substance of the cord, but the conus medullaris was not affected. The nerve tracts of the spinal cord had all but disappeared in the involved segments, and only a few brownish-colored fibrous strands remained in the upper sacral cord.

**Microscopic Examination.** The meninges of the brain and of the cervical and thoracic spinal cord appeared normal. There was slight cortical atrophy of the frontal lobes and secondary demyelinization in the dorsolateral tracts of the pons. Sections from the cervical and thoracic cord were normal. Fibrous adhesions to the lumbar and sacral cord were very dense and acellular. The cyst was partially invaginated into the cord; this intraspinal portion was completely surrounded by loose glial tissue and communicated with the rest of the cyst through a narrow neck-like opening (Fig. 4). The cyst was lined with thin, flat cells compatible with a meningeal origin. The central canal of the spinal cord was pushed to one side but did not communicate with the cyst at any level. There was pressure atrophy and severe degeneration of the spinal cord around the cystic lesion. There was no evidence of parasites in any of the sections examined.

The sciatic nerves showed marked atrophy and secondary degeneration of the nerve fibers. The quadriceps muscle showed complete denervation atrophy.

**Discussion**

Chronic adhesive spinal arachnoiditis has been described in detail elsewhere. It is characterized by local or diffuse fibrous thickening of the arachnoid and dense adhesions to the pia mater, nerve roots, and sometimes to the dura mater. Cyst formation may or may not be present. Functional impairment is produced by compression of the spinal cord or nerve roots, or by ischemia with secondary intramedullary damage. The cause has been attributed to various systemic and local infections (including meningitis and tuberculosis), trauma, spinal fracture or dislocation, ruptured intervertebral disc, lumbar punctures, intraspinal injections, and congenital spinal malformation. In almost half of the cases the etiology was not established.

Clinically the condition can be confused with spinal cord tumor. Since the neurological examination, x-rays, and cerebro-