Spinal intramedullary pseudocyst

Case report

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The authors describe a case of a spinal intramedullary pseudocyst at T-1 that did not communicate with the surrounding spaces. The cystic wall was composed of dense connective tissue without epithelial or neoplastic cells. The patient's condition improved dramatically after surgical removal of the cyst. The literature on spinal intramedullary cystic lesions is reviewed and the etiology of pseudocysts is discussed. This case is believed to be the first in which a pseudocyst has been demonstrated within the spinal cord.

**Key Words** • spinal cord • cyst • intramedullary pseudocyst

**Introduction**

Spinal intramedullary cystic lesions are rare, and are usually reported as epidermoid cysts, dermoid cysts, ependymal cysts, enterogenous cysts, syringomyelia, or intramedullary cystic tumors. A spinal intramedullary cystic lesion formed by fibrous connective tissue has not been reported previously. We describe a case of an intramedullary pseudocyst involving the T-1 spinal cord segment.

**Case Report**

This 23-year-old man was admitted to the neurological section in November, 1983, following a 17-month history of progressive weakness and numbness of both lower extremities. In June, 1982, he had experienced chest distress associated with numbness of the lower part of the right leg that spread to the right thigh region. In December, 1982, he developed paresthesia in his lower left extremity. At that time, he could stand and walk without difficulty. By October, 1983, because of progressive weakness in both lower extremities, he was unable to stand. The following month, incontinence of urine and feces developed. The patient experienced no segmental dissociation of sensation. He had suffered a fall in July, 1981, in which he sustained a direct contusion of the left anterior chest wall accompanied by severe chest pain. There was no other history of trauma. Lumbar puncture was not suggestive of previous meningeal inflammation.

**Examination.** The patient looked well, although both lower limbs were grossly wasted and paretic. Muscle strength was 1/5. There was hypesthesia from the T-4 dermatome downward, and temperature perception was affected bilaterally. Vibration sensation and proprioception were present in the lower portion of both legs, but the abdominal and cremasteric reflexes, and knee and ankle jerks were absent bilaterally. Plantar responses were absent and there was no tenderness, muscle spasm, or deformity of the spine.

Plain films of the upper thoracic vertebral column showed no evidence of a destructive lesion, congenital abnormality, or osteophytes. Computerized tomography (CT) scans, 5 mm thick and 2 mm apart, were obtained of the upper thoracic spine from the midportion of T-2 to the mid-portion of C-7. Star artifacts from residual Pantopaque and stripe artifacts from nearby bone structures caused poor-quality images, and no definite diagnosis could be made. Pantopaque myelography disclosed a large filling defect from the upper margin of T-2 to the lower margin of C-7 (Fig. 1). The lesion appeared to be within the medulla in the frontal projection, but extradural in the lateral projection. Since an extradural lesion is a more likely occurrence, a provisional diagnosis of cord compression at the T-1 level due to spinal tumor was made. Isotope bone scanning showed no bone abnormality. Cerebrospinal fluid (CSF) obtained by lumbar tap contained 158 mg% protein, 45 mg% glucose, and 125 mEq/liter chloride. The Queckenstedt test demonstrated a partial block.

**Operation and Pathological Examination.** On December 19, 1983, a thoracic laminectomy was per-
FIG. 1. Pantopaque thoracic myelograms disclosing a large filling defect from the upper margin of T-2 to the lower margin of C-7. The lesion appears to be intramedullary in the frontal projection (left), but extradural in the lateral projection (right).

formed at T1–2. The dura was observed to be stretched and soft. On opening the dura, an area of gray discol-
oration measuring approximately 0.5 × 0.4 cm was revealed on the dorsal aspect of the cord at T-1. Clear fluid was aspirated from the intramedullary cyst. Analysis of the fluid revealed 42 mg% protein, 60 mg% glucose, and 123 mEq/liter chloride. It contained no parasites, and bacterial and fungal cultures were negative. Under the operating microscope, a 1-cm longitudinal incision was made through the gray-colored spinal cord at T-1. The cyst-like lesion found within the cord at T-1 was smooth, with a thin and opalescent wall. There was no gross tumor tissue or vascular abnormality in the cyst or its wall.

The cyst wall was embedded and sectioned for microscopic examination. Only dense connective tissue without lining epithelium could be demonstrated (Fig. 2). Staining with Masson's trichrome also showed only dense connective tissue. No evidence of inflammatory or malignant tumor cells was found.

Postoperative Course. The postoperative course was uneventful. On the 7th day after surgery, urination returned to normal. Two months later, muscle power in both legs had increased to 4/5. Nine months later, light touch, pinprick response, and proprioception were all within normal limits. The patient could walk without support for a half mile at a time with only mild weakness in the right leg. Both knee and ankle jerks were increased to +3. At this time, a follow-up CT scan at T-1 still showed stripe artifacts, but postoperative real-time high-resolution ultrasound scans over the T1–2 laminectomy defect demonstrated no evidence of cystic or solid lesions (Fig. 3).

Discussion

The differential diagnosis of spinal intramedullary cystic lesions includes epidermoid, dermoid, enterogenous, or ependymal cysts and cystic intramedullary tumors such as astrocytomas, ependymomas, hemangioblastomas, spongioblastomas, and glioblastomas. Epidermoid and dermoid cysts are characterized by laminated keratin associated with keratin-producing squamous epithelial cells. 

Dermoid cysts contain a yellowish, thick, cheesy fluid. Microscopic findings include skin appendages, hair follicles, and sweat glands. The histological findings of enterogenous cysts include a single layer of ciliated columnar cells with basal nuclei resting on a layer of connective tissue. The histological characteristics of ependymal cysts are single or multiple layers of cuboidal and cylindrical epithelial cells. An intramedullary arachnoid cyst was not considered in our case, although it is possible for an arachnoid cyst to completely invaginate into the spinal cord and for its cystic wall, which is compressed due to a progressive increase in fluid, to become fibrous. In this case, there was no communication between the cystic wall and the arachnoid space, and the cyst lacked meningothelial cells.

A pseudocyst containing a collection of fluid that arises from loculation of hemorrhages, necrosis, or an inflammatory process characteristically does not have an epithelial lining and does not communicate with the surrounding spaces. Our patient had sustained a direct contusion of the anterior upper chest wall with severe chest pain caused by a fall 2 years before. Thus, a contrecoup blunt injury of the upper thoracic spinal cord with intramedullary damage might be the cause of
his intramedullary pseudocyst. Most pseudocysts reported in the medical literature were in the pancreas, spleen, parotid gland, ureter, lung, liver, or perirenal area. In the central nervous system, only meningial and cranial pseudocysts have been reported. No case of an intramedullary pseudocyst has been described.

Postoperative evaluation with non-contrast CT scanning gave an inaccurate intraspinal density because of a stripe artifact from nearby bone structure. However, the laminectomy defect provided an acoustic window for viewing the intraspinal contents with high-resolution real-time ultrasound scanning. This procedure clearly demonstrates whether the spinal cord is enlarged or atrophic. In our case, linear-array, sector real-time imaging using real-time high-resolution ultrasound. Radiology 147:459–465, 1983


