Spinal cord herniation into a congenital extradural arachnoid cyst causing Brown-Séquard syndrome

Case report

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This is a report of a patient who developed sharp intercostal pain and Brown-Séquard syndrome. Displacement of the spinal cord toward an extradural mass was noted at the T4-5 vertebral level on iophendylate myelography and metrizamide computerized tomography myelography. Multiple meningeal diverticular lesions of congenital origin were also found. Surgical correction of the spinal cord, which had herniated into a laterally located extradural arachnoid cyst and become incarcerated, resulted in a complete neurological recovery.

KEY WORDS - spinal cord · herniation · arachnoid cyst · meningocele · Brown-Séquard syndrome · metrizamide computerized tomography myelography
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Fig. 1. Iophendylate myelogram showing displacement of the thecal sac to the right, with an extradural defect along the left lateral border at the T-4 and T-5 vertebral levels (arrows). Note an acute-angled displacement of the spinal cord at the T4–5 level toward the left (arrowheads).

Review of the myelogram (Fig. 1) disclosed the inconspicuous but definite presence of a mass to the left of the T-4 and T-5 levels. Displacement of the cord toward the lesion was also noted. Metrizamide computerized tomography (CT) myelography (Fig. 2) showed a round mass to the left of the spinal cord. There was, again, displacement of the cord, leaving an ample subarachnoid space to the right of the cord.

Operation. On November 15, 1977, the patient underwent laminectomy from T-3 through T-6. At the T-4 level, a spherical mass about 12 mm in diameter was seen to protrude from the left lateral side of the dura, mildly compressing the pedicle (Fig. 3A). The thecal sac as a whole was shifted to the right side.

Upon incision of the dura mater, the spherical mass was found to be continuous with the spinal cord through a neck 8 mm in diameter, and the spinal cord was displaced to the left side as if pulled by the mass. The dural membrane constricting the neck, completely covering the mass and adherent to the underlying arachnoid-like tissue, was carefully dissected and incised. It contained a semi-spherical mass which was smooth, rubbery, yellowish-white, and tumor-like (Fig. 3B). The spinal cord itself was 5 mm in width at the level of the mass and 8 mm above and below. Puncture of the mass yielded no fluid, and biopsy of the mass revealed no tumor cells. The spherical mass proved to be the herniated spinal cord in a dural outpouching or meningeal diverticulum. A fascial flap was sutured to the dural opening in order to enlarge the dural cavity and relieve the tension around the incarcerated spinal cord (Fig. 3C).

Postoperative Course. The postoperative course was complicated by cerebrospinal fluid accumulation and subsequent wound dehiscence with gradual healing. The patient was discharged 4 weeks postoperatively. He gradually acquired improved motor function, the headache and the intercostal pain were relieved, and he subsequently returned to full work. Two months postoperatively his neurological examination was normal. He has continued to enjoy a normal life for 3 years.

Discussion

Spinal cord herniation into an iatrogenic meningocele or pseudocyst has been described by several authors. Wortzman, et al., reported a case in which the spinal cord herniated anteriorly and extradurally through a dural defect into a thoracic vertebral body. The cause of the dural defect in their case was unknown. Our patient had no history of laminectomy or penetrating injury to the dura mater. It may reasonably be postulated that our patient suffered herniation and incarceration of the spinal cord in a previously empty congenital extradural arachnoid cyst. This is further substantiated by the concomitant presence in our patient of various meningeal cysts and diverticula of congenital origin.

Congenital extradural arachnoid cysts of congenital origin are rare conditions and usually occur in the midthoracic area. Etiology of these cysts was proposed as either a congenital diverticulum of the dura mater or herniation of the arachnoid through a congenital defect in the dura mater. Another type of meningeal diverticulum has been reported, namely, the lateral intrathoracic meningocele. These are dural and arachnoidal outpouchings and should properly be
Cord herniation with congenital arachnoid cyst

FIG. 3. Schematic drawings of operative views. A: An extradural mass was situated at the T-4 level, compressing the pedicle. B: The dura mater was cut open to reveal the displacement and herniation of the spinal cord into a dural outpouching. C: A fascial flap was sutured to the dural opening to relieve the tension at that point.

considered as extradural arachnoid cysts which have become so big that they expand into the thoracic cavity.3,6

Etiology of the headache in our case is obscure. It may be related to the spinal cord herniation, as evidenced by its cessation after surgery. Headache has occasionally been mentioned as a presenting symptom of meningeal cysts or diverticula.12,13,15

Diagnosis of spinal cord herniation in the previously reported five cases1,2,7,15,16 as well as our own was established during surgery. In the preoperative myelogram, Cobb and Ehni2 reported an unusually dorsal position of the spinal cord in their case of posteriorly placed spinal cord herniation. Wortzman, et al.,16 noted the presence of an extradural mass and concomitant displacement of the spinal cord toward the lesion in their myelography. Our myelogram and metrizamide CT myelogram clearly demonstrated these pathognomonic findings.

Although spinal cord herniation is a very rare complication of extradural arachnoid cysts or iatrogenic meningoceles, it should be considered as a differential diagnosis when there are symptoms of spinal cord derangement not associated with a subarachnoid block. Careful scrutiny of the myelogram and/or metrizamide CT myelogram should lead to proper diagnosis and treatment.

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