Isolated Interruption of Spinothalamic Tract by Arachnoid Cyst

Case Report

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This intradural cyst, despite its free communication with the subarachnoid space, produced localized pressure manifested solely by interruption of function of one anterolateral column.

Case Report

A white man, age 40, was first seen on November 22, 1968, with the complaint of "numbness of the right leg." The patient arose on the morning of November 9, 1968, feeling in his usual health until leaving the house when he observed that his right leg felt cold. The next day he realized that it was also insensitive to the pain caused by pulling the hair or pricking with a pin. He also found he had to test his bath water with his left foot because he could not appreciate temperature with the right. There was no progression of symptoms, and the patient continued to work as a truck driver, with no impairment of strength or coordination.

Examination. The patient was a large man, 6 ft 5 in tall, weighing 260 lbs, who appeared in good health. His station, gait, and Romberg tests were normal, and he was able to balance well on either foot. The positive neurological findings consisted of total loss of ability to appreciate pain, heat, and cold up to the level of the 6th thoracic dermatome on the right side, except for small spotty areas on the abdomen and on the glans penis where pinprick could be faintly appreciated. Light touch appreciation appeared normal, but simultaneous, bilateral tactile stimulation with the moving finger felt "slightly different" on both legs. The cremasteric reflexes were absent bilaterally. The right abdominal reflex was absent, and the left sluggish. Vibratory and position perception were intact. Tendon reflexes were normal, and there was no Romberg sign. There had been no alteration in sweating, sphincter function, or potency. This man, therefore, presented findings that would be anticipated after a left anterolateral cordotomy at the level of the 4th thoracic vertebra.

The patient was admitted to the hospital November 29, 1968. Routine laboratory studies and x-rays were normal. Spinal puncture with an 18-gauge needle disclosed a normal pressure. The arterial pulsations were free, and there was prompt and adequate rise on jugular compression. The spinal fluid was clear and colorless and contained one red blood cell and two lymphocytes per cu mm; total protein content was 37 mg% and colloidal gold test and serological reactions were negative. After removing the specimen of spinal fluid, 10 ml of Pantopaque was introduced and the patient was placed face down. The distribution of Pantopaque in the lumbar canal was normal, and on tilting the table it flowed freely to the T-4 level where definite pocketing occurred. After slight hesitation some of the medium passed into the cervical subarachnoid space (Fig. 1). When the table was tilted in the opposite direction, the Pantopaque, which had outlined the pocket at T-4, flowed caudally to T-7 where it hesitated briefly and again exhibited a fluid level. These findings indicated a diverticulum of the subarachnoid space extending from the level of T-4 to T-7. Because the neurological signs corresponded with the upper level of this diverticulum, and despite the fact that the lesion communicated freely with the subarachnoid space, an operation was advised.

Operation. On the 27th day after onset, with the patient in the prone position, the laminae from T-4 to T-7 were removed and the dura carefully opened throughout the length of the exposure. With the patient's head low, the diverticulum was clearly visible through the distended arachnoid on the left posterior aspect of the spinal cord. Its cephalad end, containing colorless fluid, was

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obviously separate from the arachnoid. Photographs of the lesion were made before and after introduction of a few drops of indigo carmine through a 25-gauge needle (Fig. 2). The table was then tilted to allow the dye-stained fluid to gravitate caudally, but by this time the torn arachnoid had collapsed so that the indigo carmine did not outline the lower end of the diverticulum as shown by the Pantopaque.

The arachnoid was then incised, the upper end of the cystic lesion was grasped with forceps, and an attempt made to dissect it from the surface of the cord. However, except at this upper level, it was found to be adherent to pia and to arachnoid. The upper dome of the diverticulum was incised after inserting a cotton pattie into the lumen so that the inner and outer surfaces could be identified following fixation. The posterior wall of the cystic diverticulum with its adherent arachnoid was dissected from the posterior surface of the cord down to the lower part of the exposure, where it appeared to end. The spinal cord appeared normal. The surgeon was unable to identify the communication with the subarachnoid space by which the Pantopaque

Fig. 1. Myelograms showing the top of the diverticulum outlined by Pantopaque (arrows). Left: Posteroanterior view. Right: Lateral view.

Fig. 2. Operative photograph showing top of the diverticulum outlined by indigo carmine (upper arrow) and tear of the arachnoid (lower arrow).
had entered the cystic diverticulum. The dura was closed with a running silk suture.

Microscopic examination of the removed specimen disclosed normal appearing arachnoid membrane.

Postoperative Course. By the fourth postoperative day, the patient reported definite return of sensation in the right leg and was readily able to appreciate pinprick. He was discharged 14 days after operation, by which time he had regained virtually all sensation. When seen 2 months after operation, he reported that bath water still did not feel quite as hot on the right leg as on the left. On testing, there was possibly slight impairment of appreciation of pinprick and of temperature in the right leg up to the knee.

Comment

Since the patient's symptoms were discovered after awakening, it is believed the cystic diverticulum became distended during sleep when his position permitted the development of a one-way valve effect, according to his wife, the patient always slept on his back.

That the lesion was responsible for the sensory defects is indicated by the fact that it corresponded with the sensory level, which after persisting for 27 days began to clear within 4 days after operation. Since this posteriorly-located lesion produced anterior column symptoms, traction by the dentate ligament may have been the responsible factor.

In a review of the literature, Lombardi and Morello found 16 cases of intradural arachnoid cysts, and subsequently Cloward found 91 cases in which similar lesions were located extradurally. In both locations the cysts usually were incidental myelographic findings, but in some instances neurological symptoms were produced, either with or without myelographic evidence of communication with the subarachnoid space.

Summary

We have described in some detail the diagnosis and successful treatment of an arachnoid cyst that apparently caused localized pressure on the spinothalamic tract.

References