Progressive neurological dysfunction secondary to postoperative cervical pseudomeningocele in a C-4 quadriplegic

Case report

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A case is detailed of a patient who developed progressive neurological deficit above a fixed quadriplegic level at C-4 18 years after posterior cervical decompression for trauma. Diagnostic evaluation revealed a pseudomeningocele at the site of his previous surgery. Subsequent operative closure resulted in reversal of his neurological symptoms.

KEY WORDS - meningocele • myelography • spinal cord injury • spinal cord compression • traumatic meningocele

INITIAL management of acute traumatic cervical cord injury has included posterior cervical decompression with dural opening in an attempt to relieve pressure from the injured, swollen spinal cord. This procedure appears to offer little benefit to patients presenting with signs of complete physiological cord transection. The following case report describes an unusual complication occurring many years after posterior decompressive surgery, and illustrates the value of vigorous diagnostic appraisal of progressive upward neurological dysfunction in the quadriplegic patient.

Case Report

A 41-year-old man suffered a diving accident in 1958 with immediate, complete C4-5 quadriplegia. Two days after injury the patient underwent a C-3 through C-6 posterior decompressive laminectomy with probable dural opening (operative details are not available). He did not improve and was left with a stable C-4 quadriplegia. Three years postoperatively, he developed headache and orthostatic drop attacks with no increase in neurological deficit. Myelographic evaluation revealed "butterfly cysts" in the cervical decompression site. At exploration the cysts were removed (again, operative details are not available) and his symptoms improved. His condition was stable over the next 15 years until early 1976, when he noted progressive weakness in his left biceps and deltoid muscles, manifested by difficulty in controlling his electric wheelchair. In addition, he noticed an ascending sensory level on the left, which included a portion of his face, and mild left posterior neck pain. There had
been no antecedent trauma, and he denied headache or syncope.

Examination. Physical examination revealed that the patient had a C-4 quadriplegic level, with fair deltoid movement bilaterally and a trace of left biceps motion. There was loss of pain sensation over the left mandible and adjoining scalp. The posterior cervical incision was well healed and flat, and did not feel fluctuant. Myelography demonstrated an incomplete block to Pantopaque at C-4, but air passed readily beyond this level and outlined a large pseudomeningocele at the superior aspect of the previous bony decompression (Fig. 1). Following the air myelogram there was transient improvement in left deltoid and biceps strength and a receding of the facial numbness.

Operation. At surgery a white, smooth-walled cyst filled with clear spinal fluid extended the length of the previous surgical decompression (Fig. 2). At the level of C-2, representing the superior aspect of the cyst cavity, there was a circular opening 1.5 cm in diameter communicating with the spinal subarachnoid space through a dural defect. A knuckle of tethered, atrophic spinal cord herniated through the opening with each cardiac beat. The adhesions around the cord were lysed, allowing for a more normal position in the canal, and the dural defect was closed occlusively with silicone dural substitute. After the cyst lining was subtotally removed, the paraspinous muscles were closed in imbricated layers.

Postoperative Course. The postoperative course was benign with marked improve-
Symptomatic cervical pseudomeningocele

ment in left biceps and deltoid function and remission of sensory complaints. The patient is now, once again, able to manage his wheelchair and has resumed his former independent lifestyle.

Discussion

Although cervical meningoceles are not uncommon following surgical procedures in which the dura has been left open, most of them are asymptomatic. We are unaware of other case reports of delayed symptomatic cervical pseudomeningocele after posterior cervical decompression for trauma. Cases of similar pathophysiology with progressive neurological dysfunction have been reported following posterior cervical decompression for cervical spondylosis. As was true in our patient, occlusive closure of the dural defects in these cases resulted in neurological improvement. The differing etiologies of pseudomeningoceles and the possible mechanisms by which they are formed in both the cervical and thoracolumbar areas have been reviewed recently by Cobb and Ehni and Goodman and Gregorius and will not be repeated here.

The diagnosis of cervical pseudomeningocele may be impossible by routine Pantopaque myelography. Postoperative and posttraumatic arachnoidal defects may impede the flow of dye, and the fluid dynamics in the neck may exclude hyperbaric oil from entering a meningocele. The dorsal location of a postoperative meningocele makes its visualization with Pantopaque difficult, but the application of gas myelography has the advantage of outlining the dorsal surface of the spinal cord as well as dorsally located defects with the patient in the prone position. When tomography is employed as part of the filming procedure the value of gas myelography is enhanced and good resolution of detail in the cervical region is possible.

Quadriplegic patients with a C4–5 level are extraordinarily dependent on their minimal remaining upper extremity muscle function for maximum utilization of technical aids for the control of wheelchairs, beds, and motor vehicles. Rehabilitation training in the use of these devices has allowed many quadriplegics to lead independent and useful lives. The present case illustrates that what might initially be regarded as an insignificant loss of neurological function in a patient who already is completely quadriplegic actually represents for that patient a devastating loss of independence.

It seems important that physicians caring for the patients with spinal cord injuries become very sensitive to slight changes in motor ability, and when such changes become evident pursue appropriate diagnostic studies to identify correctable lesions. The value of such an approach in the life of a quadriplegic is demonstrated by this case, in which progressive neurological dysfunction as a result of a postoperative cervical pseudomeningocele was reversed by accurate evaluation and satisfactory surgical closure of the defect.

References


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