Ependymal cyst of the thoracic spinal cord

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SYNOPSIS A unique case of an ependymal cyst on the anterior aspect of the thoracic spinal cord in a woman aged 68 years is described. Clinical signs were precipitated by trauma. Recovery of function, while incomplete, was remarkably good after extirpation of the cyst.

Intradural extramedullary ependymal cysts of the spinal cord are most uncommon, and only a few have been recorded in the literature (Hyman et al., 1938; Johnston, 1959; Hoffman, 1960; Morello and Lombardi, 1964; Moore and Book, 1966). The reported cases have been in children and young adults and have occurred in the cervical region. With surgical removal, the patients usually do well and manifest remarkable recovery from their neurological deficits. We are reporting a case of an ependymal cyst of the thoracic region of the spinal cord in a 68 year old woman.

CASE HISTORY

O.K. (WVU 193027), a 68 year old woman, was admitted to the WVU Hospital in July 1969 with a history of progressive numbness and weakness of her legs. About eight weeks before being seen here, she sustained a fall, after which she had noted back pain and some right leg pain. She had also noted some weakness of both legs and difficulty in walking. This persisted for about four weeks, at which time she was admitted to another hospital for evaluation. One day after admission there she complained of increasing back and chest pain. An electrocardiogram showed evidence of an inferior infarction and she was confined to bed until the age of the electrocardiographic changes could be determined. Over the next two weeks it was determined that her electrocardiographic pattern was stable and that this represented an old infarction. She also had diabetes mellitus and required stabilization of her blood sugar. She remained there for another two weeks during which time her leg weakness and numbness progressed to the point of paraplegia with bowel and bladder incontinence. She was transferred to the WVU Hospital for further evaluation. She was seen by the neurosurgery consultant on 11 July 1969, six days after onset of her paraplegia.

On examination she had a flaccid paralysis of both legs. Pain and temperature sensations were absent
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below the T6 dermatome. Light touch was not detectable below the knees. No position or vibratory sensation was present below the knees, and was markedly diminished from the knees to T6 dermatome. The deep tendon reflexes were absent in the legs and normal in the arms. The abdominal reflexes were absent. The plantar reflexes were extensor. There was percussion tenderness present over T5, 6, and 7 vertebrae.

Upon opening the dura mater, a cystic mass was noted on the left side anterior to the spinal cord. Aspiration of the cyst yielded a grey mucoid fluid. Dissection of the cyst revealed that it originated from an intramedullary site in the spinal cord. The cyst had apparently expanded in an anterior direction and invaginated the cord behind it, and had become primarily an extramedullary mass. At the superior aspect of the cyst there was a fibrous tail which extended about 1 1/2 segments superiorly and then terminated. There was no evidence of any connection between the cyst and the vertebral body.

**POSTOPERATIVE COURSE** Ten days postoperatively she was able to move the left foot slightly, and this improved progressively. After 20 days she manifested some movement of the right foot. She was transferred to a rehabilitation centre where she remained for three months. At the end of this period she was ambulatory with long leg braces and axillary crutches. She was entirely self-sufficient in all activities of daily living and was able to effect all transfers of herself without assistance. She was fairly continent

**FIG. 2. Surgical specimen after aspiration of fluid from the cyst.**

**INVESTIGATIONS** The electrocardiogram showed an old inferior infarction pattern. Radiographs of the chest, thoracic and lumbar spine were normal. An intravenous pyelogram done at the previous hospital showed duplication of the left kidney and ureter with normal function. Blood counts, urinalysis, and blood chemistry were normal except for glycosuria and hyperglycaemia.

On 11 July 1969 a myelogram was done (Fig. 1) which showed evidence of an intradural, extra-medullary block at T6-7 intervertebral space. Cerebrospinal fluid obtained at this time was clear and colourless with one white cell. The protein was 68 mg/100 ml.

**OPERATION** After the myelogram, she was taken to the operating room and in the prone position a laminectomy of T5, 6, and 7 vertebrae was done.

**FIG. 3. Microscopic appearance of the inner lining of the cyst. × 250.**
of urine and had good bowel control. She continued to improve and was able to care for herself at home. She was ambulatory with braces in the home and used a wheelchair when outside. In 1973, at the age of 73 years, she moved to a home for the aged where she now resides.

MACROSCOPY The specimen measured $1.0 \times 0.5 \times 0.5$ cm (Fig. 2). It had been estimated to be $3 \times 1 \times 1$ cm before removal. It had a 3 cm long fibrous band attached to it (Fig. 2).

MICROSCOPY The cyst was lined with a single layer of cuboidal cells with an underlying collagenous layer of varying thickness. In the areas where infoldings of the lumen were seen the lining consisted of ciliated cuboidal cells (Fig. 3). No goblet cells were present. Cross-sections through the fibrous strand showed a similar structure. The smear of the aspirate from the cyst showed globular proteinaceous material with scattered psammoma bodies. Several cells laden with haemosiderin were seen. The mucin stain was negative. A diagnosis of ependymal cyst was made.

DISCUSSION

Ependymal cysts of the spinal cord have been reported to occur on the anterior surface in children or young adults (Hyam et al., 1938; Hoffman, 1960; Morello and Lombardi, 1964; Moore and Book, 1966). In some patients evidence of cord involvement was present since birth; in others it appeared later. Trauma has been mentioned as a factor in the precipitation of symptoms from spinal cord cysts (Scoville et al., 1963). Moore and Book (1966) postulated that trauma-induced symptoms could be due either to haemorrhage into the cyst or by an alteration of the hydrodynamic forces in the subarachnoid space surrounding the lesion.

It has been theorized that ependymal cysts originate from evaginated cell rests of the floor plate of the neurectoderm which are ‘cut off’ from the main mass of the neural tube in the developing embryo (Hyman et al., 1938). They may well be of the same origin as cerebral ependymal cysts and choroid plexus cysts, and Shuangshoti and Netsky (1966) have postulated a common origin for these cysts throughout the neuraxis. They believe that the basic aetiology consists of trapped portions of invaginated or evaginated ependyma, and proposed the name ‘neuroepithelial cysts’.

Ependymal cysts differ from neurenteric cysts in that the latter have mucin-producing goblet cells (Harriman, 1958; Klump, 1971). Neurenteric cysts usually have a demonstrable connection between the cysts and the vertebral body, and frequently have associated spinal and intestinal anomalies (Tarnay et al., 1970; Silvernail and Brown, 1972; Millis and Holmes, 1973).

The cyst in this case fits the histological criteria for the diagnosis of ependymal cyst. Even the lining of the fibrous strand was similar to that of the main cyst. She had one other congenital anomaly, a reduplication of the left kidney and ureter. The fact that symptoms did not occur until the seventh decade of life is very unusual for a cyst of presumed congenital origin. It had apparently remained of insufficient size to produce cord compression until the trauma caused it to enlarge. The presence of phagocytized haemosiderin in the cyst is indicative of prior bleeding, and tends to incriminate traumatic haemorrhage as the cause of cyst enlargement. Her recovery from paraplegia to a state of independent ambulation with braces and crutches is in keeping with the previously reported good recovery after operative removal of the cyst (Hyman et al., 1938; Hoffman, 1960; Moore and Book, 1966).

REFERENCES

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*J Neurol Neurosurg Psychiatry* 1974 37: 974-977
doi: 10.1136/jnnp.37.8.974

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