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Intradural Spinal Lipoma of the Cervical Cord

Beverly P. Wood,¹ Derek C. Harwood-Nash,² Paul Berger,³ and Marilyn Goske¹

Intraspinal subdural lipomas are rare tumors of the spinal canal. Such tumors occur in the thoracic and cervical region; however, extension into the posterior fossa and fourth ventricle is most unusual. We describe two children, an infant and a teenager, with progressive neurologic deficit from such a lipomatous tumor. The lipoma in the infant extended into the lower fourth ventricle and caused ventricular obstruction.

Case Reports

Case 1

A 5-month-old boy was reported as normal at birth. His mother had noted diminished use of his arms over the previous 4 weeks and a progressive tendency to hang his arms straight at his sides. On physical examination the infant was bright, alert, and well nourished. He had attained normal developmental levels but refused to move his arms, which hung limply at his sides. No external mass or sinus was seen on the back. His head circumference was above the 95th percentile. He was markedly hypotonic, and the reflexes in the upper extremities were diminished. The lower extremities had normal motor strength and hyperreflexia. Sensory examination showed a capelike deficit over the neck and shoulders. Electromyography indicated increased amplitude of polyphasic potentials in the deltoid muscles, indicating chronic denervation. Muscle potentials in the legs were normal.

On radiographic examination of the cervical spine, the canal diameter and foramen magnum were expanded (fig. 1A). Sonography of the brain indicated mild dilatation of both the lateral and third ventricles. The region of the fourth ventricle was expanded and markedly echoic, surrounded by normal cerebellum. Lumbar puncture showed normal pressure, no cells, and elevated cerebrospinal fluid (CSF) protein (111 mg/dl).

Metrizamide-enhanced CT showed a complete obstruction to contrast flow at T2. From this level cephalad, the expanded spinal canal was filled with homogenous material of fat density (−80 to −140 H), with only a small amount of neural tissue seen displaced into the ventral part of the canal (fig. 1B). The fat extended intracranially into a markedly expanded fourth ventricle (figs. 1C and 1D). The lateral and third ventricles were dilated.

The infant was taken to the Hospital for Sick Children in Toronto for surgery. The dura was extremely tight and nonpulsatile. On

opening it, a continuous lipoma extending from T2 into the medulla was partially removed. The dural sac was expanded using freeze-dried dura. Over the ensuing 8 months, his hydrocephalus has regressed and he has regained slight use of both arms.

Case 2

A 15-year-old girl entered Children's Hospital of Buffalo with a history of back and leg pain after an accident in gym several months before. Since then, she had limped on the right, developed occasional numbness, and experienced some difficulty walking. Neurologic examination showed complete loss of position sense in the lower extremities. Touch and vibration sense were diminished up to the T5 dermatome. There was clonus in the lower extremities, and her gait was unsteady.

Radiographs of the cervical and thoracic spine showed spreading and thinning of the pedicles of the C3–T6 vertebrae (fig. 2A). On myelography, the spinal canal was partially obstructed at T5. CT examination of the spine showed that the expanded canal from C3 to T6 was filled by a mass of fat density (−71 to −122 H) that compressed the neural elements ventrally against the scalloped posterior vertebral bodies (fig. 2B). CSF protein was markedly elevated (245 mg/dl).

Preoperatively, a small subcutaneous lipoma was palpated at the cervical region. This was dissected free and contained no visible connection to the spine. Laminectomy from T4 to C5 showed distended dura. A large fat mass was adherent to the dura in the lower areas and intimately attached to the dura, depressing and infiltrating the cord in the upper part. The bulk of fat was removed. One year postoperatively, she shows mild spastic ataxia, position sense is still absent, and other sensation is normal.

Discussion

Intradural (subpial) lipomas of the spinal canal are quite rare. Ehni and Love [1] found they accounted for only 1% of the tumors of the spinal cord. Vertebral and dermal abnormalities are not a feature of these tumors as they are with the more commonly seen lipomas associated with forms of dysraphism. Other associated vertebral and renal abnormalities are absent in these patients [2].

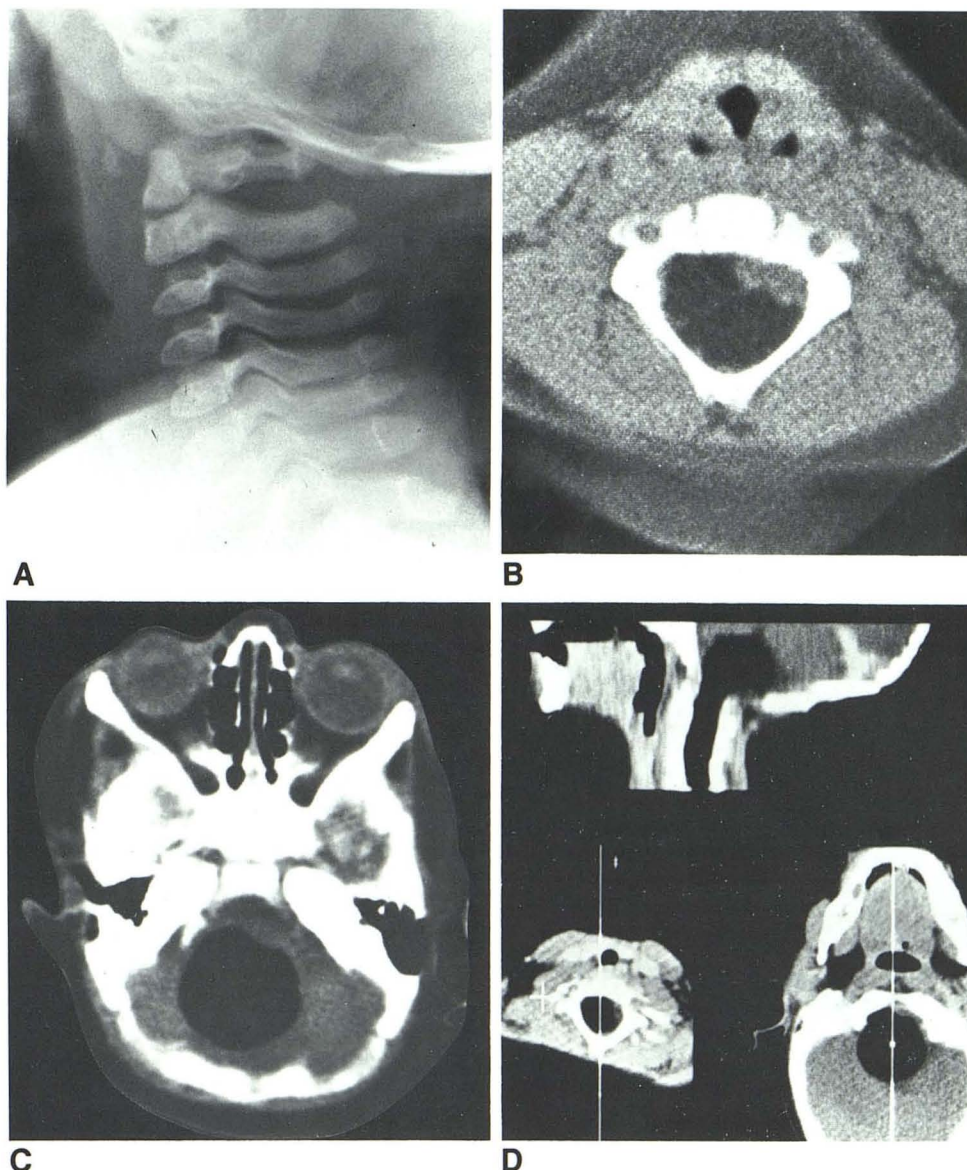
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Fig. 1.—Case 1. **A**, Widened cervical spinal canal. **B**, CT scan of upper cervical region. Large low-density mass (–140 H) fills subdural space and compresses neural tissue anteriorly. **C**, Intracranial expansion of lipoma into fourth ventricle, compressing cerebellum. **D**, Sagittal reconstruction of lipoma, which extends into fourth ventricle.



The embryologic defect that produces an intradural lipoma is not proven. Lipomas originate in a dorsal, juxtamedullary position. Subsequent growth causes ventral flattening of the cord, separation of the posterior columns, and incorporation of the nerve roots. Thus, at surgery, they give the appearance of being intramedullary. The advancing upper and lower margins are easily separable from the cord.

The clinical course is usually one of very slow progression of symptoms. Leg weakness, hypotonia, loss of position sense, and gait disturbance are common presentations. Mild but progressive symptoms in the face of very marked cord disfigurement reflects the slow growth of these lesions. The peak ages of diagnosis are in the first 5 years of life (24.1%) and early adulthood (55%) [3].

Plain radiographs of the spine show widening of the spinal canal in the involved area with spreading and thinning of the

pedicles. Myelography shows complete obstruction to contrast flow by a lobulated asymmetric mass.

The CT scan is characteristic and diagnostic. Within the widened canal, the spinal cord is remarkably thinned and flattened ventrally. The rest of the canal is filled with material of fat density.

Although these lipomas are not considered neoplastic, they have the capacity for autonomous, slow growth. Current therapy consists of partial surgical excision with wide laminectomy. Complete excision can never be accomplished because of the extent of infiltration of the cord and surrounding nerve roots. Nevertheless, some improvement in symptoms or arrest of progression occurs with such treatment. To date, impressive regression of symptoms has not been accomplished. Intracranial extension is rare [4, 5] but more threatening because it produces obstructive hydrocephalus.

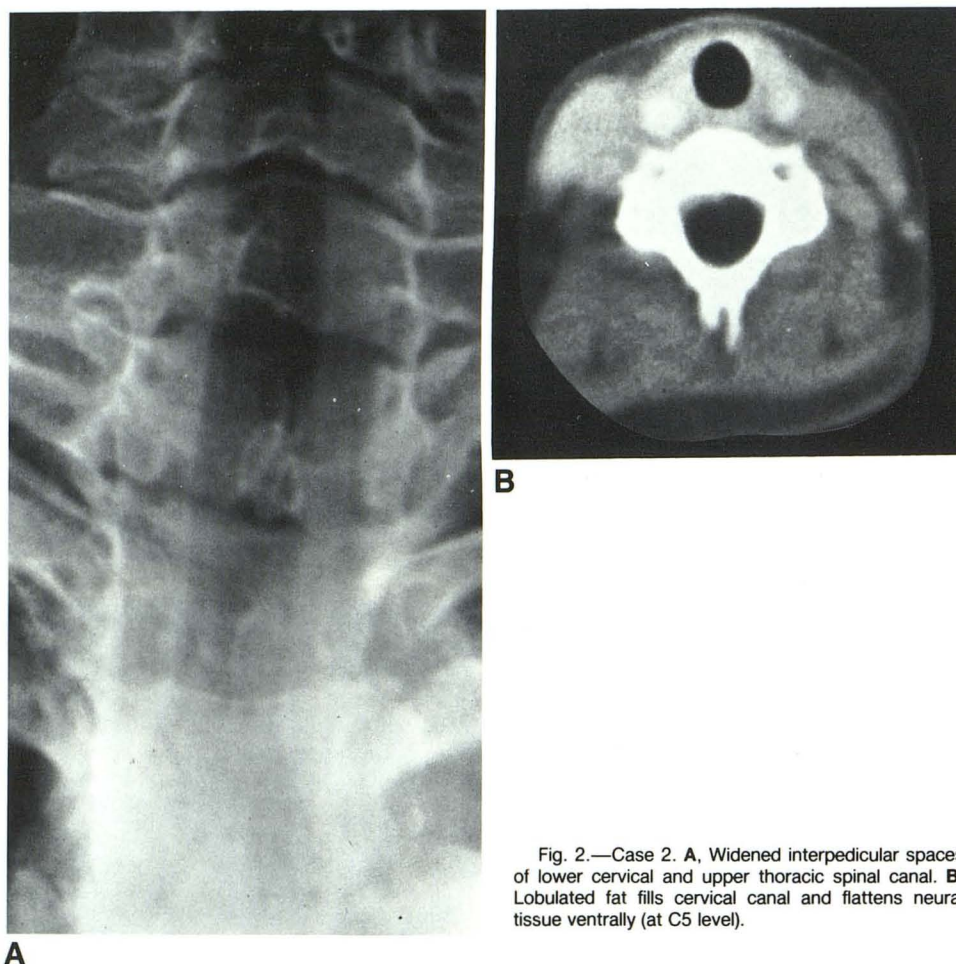


Fig. 2.—Case 2. **A**, Widened interpedicular spaces of lower cervical and upper thoracic spinal canal. **B**, Lobulated fat fills cervical canal and flattens neural tissue ventrally (at C5 level).

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