Spinal Epidural Meningioma
Case Report

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The rarity of spinal epidural meningiomas was noted by Haft and Shenkin. Spinal meningiomas, either intradural or extradural, are uncommon under the age of 15 years. At the Columbus Children's Hospital, this case of spinal epidural meningioma is the only meningioma in 20 primary spinal neoplasms treated over the past 15 years.

Reports of successfully managed cases of epidural meningiomas in children are even rarer than the entity itself. The most successful result that we have found is that reported by Ingraham. Considerably less satisfactory results were reported by Niosi and Rand and Rand. All 3 of these reports concerned children between 7 and 10 years old.

Case Report

W. S., a 14-year-old boy, was admitted to the Columbus Children's Hospital on August 4, 1965. For 5 weeks he had experienced the gradual onset and steady progression of stiffness and weakness of the legs. He denied any sensory symptoms, except for some tingling and numbness of the lateral aspect of the left foot which had occurred early in the course of his symptoms, and had lasted but one day. He had experienced no loss of bowel or bladder function. The weakness in his legs had progressed so that at the time of admission he had difficulty walking.

Fig. 1a. Plain lateral spine films showing erosion of the 4th thoracic vertebral body posteriorly (arrows).

Received for publication April 8, 1966.

Fig. 1b. Myelogram, taken with the patient in deep head down position, showing complete block of contrast medium typical of an epidural mass. The level of the block was at the 4th thoracic vertebra.
with normal epidural fat both superiorly and inferiorly. Most of the tumor was anterior and to the left, and was about 1 cm. thick. Tumor encircled approximately 300° of the circumference of the dural sheath. The severely compressed cord was displaced posteriorly and to the right. Frozen sections were diagnostic of psammomatous meningioma. The entire tumor was removed piecemeal. It was necessary to excise the intraspinal extradural portion of the left 4th thoracic nerve trunk.

The origin of the tumor appeared to be an area 8 mm. in diameter on the outer surface of the dura. It was located anterolaterally and extended into the inferior axilla of the 4th thoracic nerve root sleeve. This area of origin, together with a comfortable margin of normal appearing dura, was excised without rupture of the arachnoid membrane. This left about 270° of the circumference of the cord exposed with dura remaining only over the right posterior quadrant. No attempt was made to place a dural substitute or graft; the arachnoid was covered with thin sheets of gelfoam.

Photomicrographs of the permanent sections are shown in Fig. 2. There was no evidence of tumor on the inner surface of the dura or around the dural margins on microscopic examination.

Postoperative Course. At first the patient’s neurological deficit was worse. There was marked, but not

Fig. 2a. Photomicrograph of the epidural tumor, showing typical architecture of a psammomatous meningioma. ×125.

Examination. The boy was well-developed, muscular, and lean. He had a typical spastic, scissoring gait. There was marked spastic paresis of the legs, including the pelvic flexors, somewhat worse on the left side. Marked hyperreflexia, sustained ankle clonus, and Babinski responses were present bilaterally. No loss of sensation to pinprick could be found. Toe position sense was present, though diminished, but vibratory sense was intact. Light touch and 2-point discrimination were reduced below the T-11 level. The Romberg test showed marked diminution of stability with the eyes closed. There was no Beevor sign, and abdominal reflexes were present in all quadrants.

Electromyography was normal up to a level of T-8. There was erosion of the 4th thoracic vertebral body posteriorly (Fig. 1a) but there was no erosion of the pedicles or widening of the interpedicular space. Spinal fluid dynamics with jugular compression indicated a complete block. Lumbar myelography (Fig. 1b) showed blockage of the contrast medium at the T-4 level from an extradural mass which was most prominent on the left anteriorly.

Operation. The 3rd, 4th, and 5th thoracic lamina were removed. A fusiform yellowish-pink mass was found in the epidural space. It tapered to become continuous

Fig. 2b. Meningioma cells invading epidural fat. ×250.
complete, sensory loss of all modalities below the T-7 level. Motor power, though still present in all muscle groups, was weaker than preoperatively. There was intermittent loss of bowel and bladder control for the first 4 postoperative days. Thereafter, his course was one of slow but steady improvement. When discharged from the hospital 7 weeks later, he was walking, and was without sensory deficit. Six months after surgery he was playing for his high school basketball team, and the only neurological finding was slight hyperreflexia of the legs.

Discussion

Cushing and Eisenhardt,1 and other authors, have described spinal tumors which were located at considerably higher levels than would be predicted from the patients' neurological findings. Our case exemplified this with a sensory level at T-11 and a tumor level at T-4. We were sufficiently misled that we performed electromyography only as high as T-8, and with negative results. Haft and Shenkin5 first performed only subtotal removal of the epidural spinal meningioma that they reported, because it was thought to be a malignant tumor. This malignant appearance was certainly present in our case; the tumor was of fusiform shape and faded imperceptibly into normal epidural fat. Only the emphatic report on the frozen section convinced us that it was benign. Haft and Shenkin5 performed total removal of the tumor in their case at a 2nd operation 1 week later. Coupling their experience with ours, we believe that frozen section examination is definitely indicated, if only to avoid missing these rare meningiomas. The histological picture of meningioma, especially those arising in the spinal region, is usually diagnostic. This is particularly true since most of them are of the psammomatous type (51 of 57 reported by Elsberg et al.2).

Epidural fat invasion is shown in Fig. 2b. Elsberg et al.2 described this same finding. Since this type of infiltration appears characteristic of this tumor, a wide excision of the epidural fat surrounding the tumor is probably indicated to prevent recurrence.

Summary

We have reported the successful removal of an extradural spinal meningioma with subsequent complete recovery from disabling neurological deficits. We have emphasized some interesting clinical aspects of the lesion, including its malignant gross appearance and the importance of frozen section diagnosis and wide excision of the surrounding epidural fat.

References