Spinal meningioma arising from a lumbar nerve root

Case report

THOMAS H. K. NG, M.R.C.PATH., KWAN HON CHAN, F.R.C.S.(ED),
KIRPAL S. MANN, M.S., F.R.C.S.(ED), AND CHING F. FUNG, F.R.C.S.(ED), F.R.C.S.(GLAS)

Department of Pathology and Division of Surgical Neurology, Department of Surgery, University of
Hong Kong, Hong Kong

A case is reported of cauda equina compression from an intradural meningioma arising from the L-5 nerve root in a young man.

KEY WORDS • intradural meningioma • spinal neoplasm

MENINGIOMAS predominantly arise in the fifth and sixth decades of life. They are uncommon in children and young adults, and more often present in females. They are most prevalent in the thoracic region, followed in frequency by the cervical and lumbar regions. A case of spinal meningioma in a young man is described. The case is unusual because of the tumor’s lumbar location and attachment only to a lumbar nerve root, and because of the relatively young age of the patient.

Case Report

This 23-year-old previously healthy male student nurse was referred to the Division of Surgical Neurology in February, 1988, because of the gradual onset over 3 months of left foot-drop and numbness and paresthesia over the lateral border of the left calf. Prior to the present admission, he received a course of physiotherapy without improvement; he was therefore admitted for further investigation.

Examination. Physical examination revealed a high-stepping gait and obvious left foot-drop with atrophy of the anterior compartment muscles of the left calf. Neurological examination revealed normal higher mental functions and normal findings in both upper limbs and the right leg. There was only Grade 1 motor power for dorsiflexion of the left big toe and dorsiflexion and inversion of the left foot. The left ankle jerk was absent. The sensory functions of the left L-5 dermatome were also impaired. The rest of the neurological and lumbar spine findings were normal. Laboratory investigations, including complete blood count and liver and renal function tests, were normal.

Lumbar spine x-ray films were normal. A positive-contrast myelogram showed a complete block at the site of the T12–L1 intervertebral disc (Fig. 1 left). The cerebrospinal fluid was crystal-clear with no cells and normal biochemical results. Subsequent computerized tomography-metrizamide myelogram showed an intradural extramedullary space-occupying lesion at the T12–L1 level (Fig. 1 center).

Operation. A thoracolumbar laminectomy was performed from T-11 to L-2. A freely mobile tumor, 2 cm in length, was found arising from the L-5 sensory nerve root on the left side, compressing the other roots (Fig. 1 right). The tumor was not attached to the cauda equina nor to the dura or arachnoid. Internal debulking of the tumor was performed and the tumor was dissected free from the motor nerve root, which was preserved. However, the part of the L-5 sensory root which lay within the tumor was sacrificed and the two ends of the nerve were freshly divided and approximated using standard microsurgical techniques. The tumor was completely excised.

Postoperative Course. There was slow and gradual improvement of the left foot-drop over the next 2 months. The numbness and paresthesia over the lateral border of the left calf persisted, however.

Pathological Examination. Grossly, the operative specimen was a whitish fleshy tumor, 2 cm long and...
Spinal meningioma from L-5 nerve root

Fig. 1. Left: Myelogram showing a complete block at the level of the T12–L1 intervertebral disc. Center: Computerized tomography scan-metrizamide myelogram showing an intradural extramedullary lesion. Right: Operative photograph showing the tumor arising from the L-5 nerve root (arrows).

1.5 cm in diameter. It was covered by a fibrous capsule. A short segment of nerve, 2 mm long, was present at one end. There was no dura attached to the tumor.

Histologically, the tumor was an angiomatous meningioma. There were many small and large vascular channels in a collagenous stroma with small intervening nests of meningothelialomatous tumor cells (Fig. 2). Focal condensations of collagen fibers forming sclerotic nodules were seen, but psammoma bodies were absent. Small nerve fibers were noted at the periphery of the tumor. Electron microscopic examination revealed tightly juxtaposed cells linked by numerous desmosomes (Fig. 3). There were abundant mitochondria and 10-nm filaments in the cytoplasm. Collagen was present in the extracellular space. The features were those of a meningioma.

Discussion

Meningiomas are tumors originating from cellular elements of the meninges, which include the dura, the cap cell layer of the arachnoid, the arachnoidal granulations, the subarachnoid blood vessels, fibroblasts, and the pia. Spinal meningiomas are more common in females, with a female to male ratio of 7:2 for spinal meningiomas and 3:2 for intracranial meningiomas.

Most spinal meningiomas arise in the thoracic region; examples in the lumbar region are very rare. Hence, only one of 18 spinal meningiomas described by Cushing and Eisenhardt was lumbar in location, and that occurred in a 50-year-old woman. Only six of 322 spinal meningiomas in the series of Slooff, et al., occurred in the lumbar region. Analysis of 705 spinal meningiomas reported by various authors has shown only 16 cases in the lumbar region, with an overall incidence of 2.3%. There is no satisfactory explanation as to why meningiomas should prefer the thoracic segment; the rarity of meningiomas in the lumbar region has often been attributed to the arrangement of the denticulate ligaments there.
Histologically, most spinal meningiomas are meningotheliomatous, transitional, fibrous, or psammomatous.\textsuperscript{4,8,10} Angiomatous examples are uncommon. It has been suggested that angiomatous meningiomas appear to develop in younger patients\textsuperscript{7} as in the present case.

Acknowledgment

We are grateful to Professor H. Adams, Department of Neuropathology, University of Glasgow, for examining and confirming the diagnosis.

References


\textit{Manuscript received July 11, 1988.}
\textit{Address reprint requests to: Thomas H. K. Ng, M.D., Department of Pathology, University of Hong Kong, Queen Mary Hospital, Hong Kong.}