

## **Hemangiopericytoma in the lumbar spinal canal: A case report**

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### ABSTRACT

We reported a case of recurrent hemangiopericytoma that arose primarily in the lumbar spinal canal. Treatments including preoperative embolization, tumor resection via anterior and posterior approaches, and postoperative radiation failed to completely eradicate the tumor, resulting in further recurrences and neurological deterioration. By reviewing the 21 cases in the literature along with this case, we discussed the clinical features and treatment outcome of intraspinal hemangiopericytoma.

**Key words :** Hemangiopericytoma, Intraspinal, Malignant neoplasm

### INTRODUCTION

Hemangiopericytoma is a vascular neoplasm thought to be derived from pericytes (1). While many locations have been described for this tumor, development in the spinal canal is quite unusual. Thus far, only five cases of primary hemangiopericytoma have been reported in the lumbar spine (2-5). In addition to the rarity of this tumor, the paucity of case reports with a long-term follow-up period leaves the clinical features and postoperative course of intraspinal hemangiopericytoma relatively obscure. In this report, we describe a follow-up case of hemangiopericytoma in the lumbar spinal canal and comprehensively review the literature.

### CASE REPORT

In November 1992 a 48-year-old man was referred with progressive pain and weakness in his left lower extremity caused by a recurrent tumor in the lumbar spine. He had received laminectomy of the thoracic and lumbar vertebrae and incomplete excision of the tumor in a previous hospital in 1989

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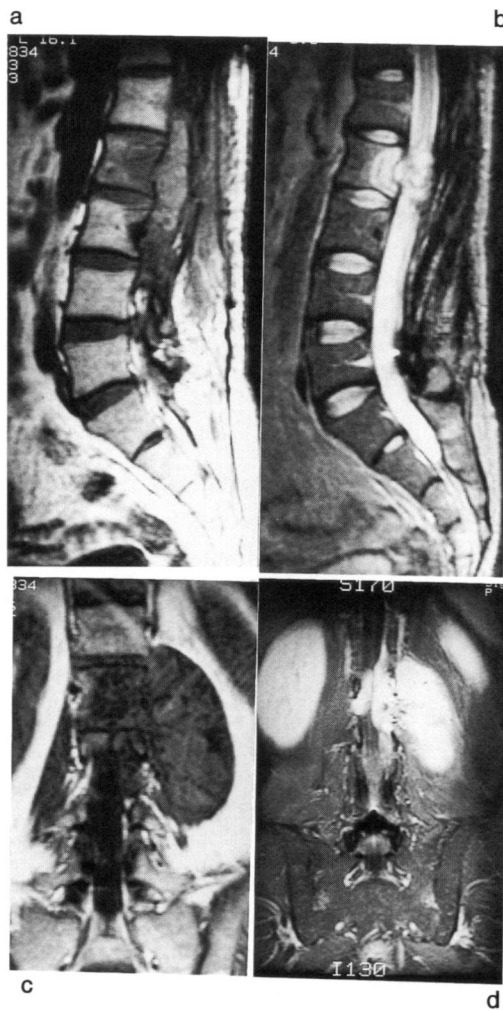
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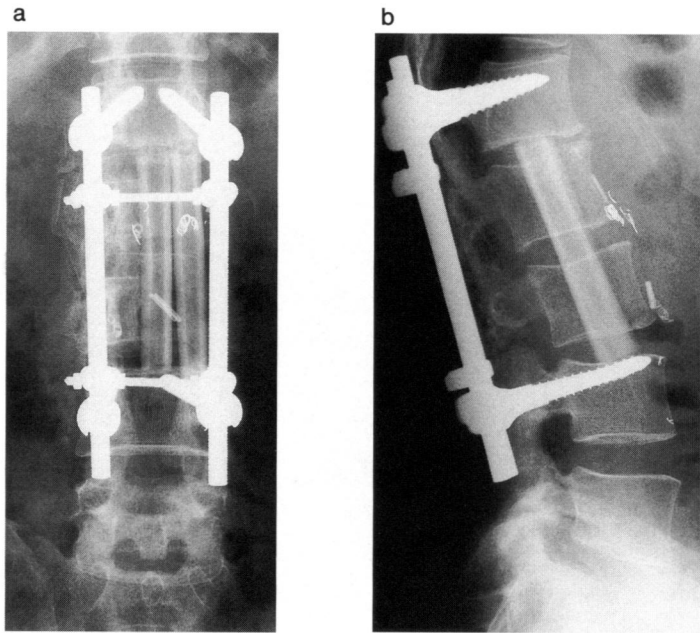
and 1991. The tumor had been diagnosed as hemangiopericytoma.

On admission, he required aid for walking. Physical examination revealed incomplete paraplegia below the level of L2, with left dominance. Bowel and bladder function were also impaired. X-rays showed resected laminae from T12 to L4 vertebrae, enlarged left L2/3 foramen, and erosion of the pedicle as well as the posterior wall of L2 and L3 vertebral bodies. MRI displayed an abnormal mass signal, iso-intensity on T1-weighted imaging and high-intensity on T2-weighted imaging, in the anterior epidural space of the L2 spinal canal extending toward the left psoas muscle (Fig. 1).



**Figure 1** MRI showing an abnormal signal mass, iso-intensity on T1-weighted imaging (a and c) and high-intensity on T2-weighted imaging (b and d), in the anterior epidural space of the L2 spinal canal extending toward the left psoas muscle.

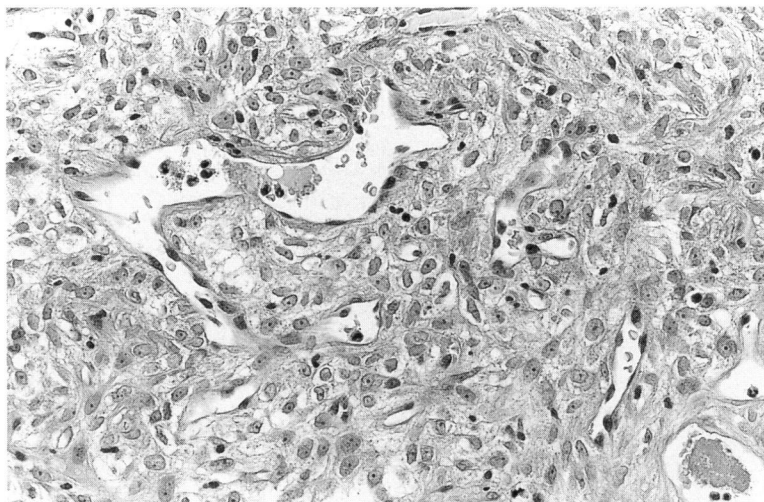
Surgery was performed by a two stage procedure in December 1992. The first stage operation consisted of posterior decompression and posterolateral fusion from L1 to L4 vertebrae with Cotrel-Dubousset instrumentation. There was no visible tumor behind the dural tube. The second stage operation was scheduled a week later, subsequent to selective embolization of the feeding arteries of the tumor. Via extraperitoneal approach, the tumor underlying the left psoas muscle was resected along with the left L2 nerve root and the posterior half of the L2 and L3 vertebral bodies, followed by suctorial resection of the tumor that had migrated into the spinal canal using a CUSA. Subsequently, dual fibulae were grafted between L1 and L4 vertebral bodies (Fig. 2). Intraoperative blood loss was 1860 grams.



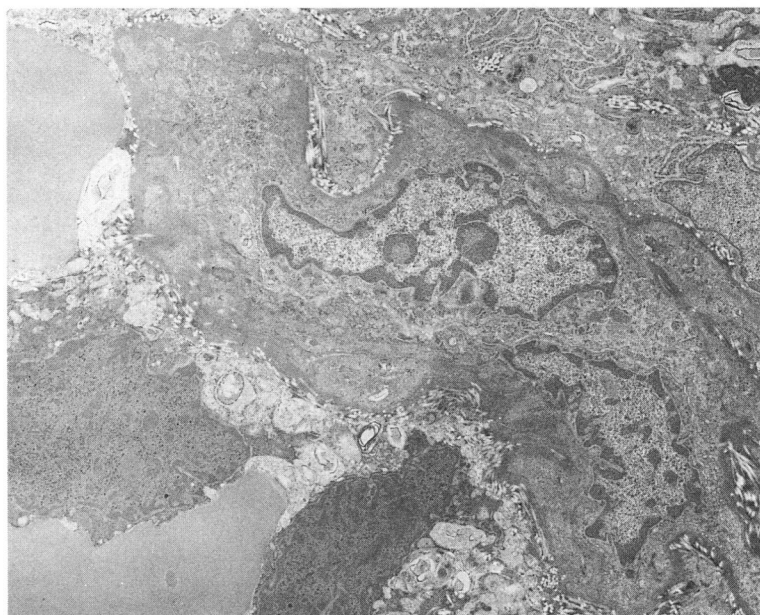
**Figure 2** An antero-posterior view (a) and a lateral view (b) of postoperative X-ray.

Histological examination of the tumor specimen exhibited numerous capillaries with a single layer of flattened endothelial cells that were surrounded by spindle-shaped pericyte-like cells with occasional mitosis (Fig. 3). Ultrastructural study demonstrated that tumor cells had ovoid nuclei, sparse organelles, and poorly developed desmosomes (Fig. 4). These findings were compatible with hemangiopericytoma.

The patient received a course of postoperative radiation therapy (4600 rads / 5 weeks). Pain in his left leg disappeared and the neurological im-



**Figure 3** A histological section of the tumor specimen (hematoxylin and eosin; x400).



**Figure 4** An ultrastructural picture of the tumor specimen (x6000).

pairment improved to the level where he was capable of walking without support shortly after surgery. The grafted bones were united at three months and he returned to work. In October 1996, he developed weakness in his left

lower extremity. Recurrence was evident in the epidural as well as the paravertebral space of T12 and L1 vertebrae. Laminectomy of T11 and T12 vertebrae and resection of the epidural tumor were performed following removal of the instruments. The paravertebral tumor was resected a week later via extraperitoneal approach. A second course of radiation (4000 rads / 4 weeks) was then given. Despite these treatments, the tumor recurred thereafter, requiring additional tumor resection in March 1997 and September 1998. Histological findings of the recurrent tumors were consistent with hemangiopericytoma with no increases in cellularity or the degree of mitosis. At the final follow-up in December 1998, the patient was in almost complete paraplegia, and there was no evidence of distance metastasis.

#### DISCUSSION

Hemangiopericytoma is a well-recognized entity regarded as an aggressive vascular neoplasm with high recurrence and a propensity to metastasize (1). This tumor commonly affects the lower extremities and retroperitoneum, but less frequently the central nervous system. Among hemangiopericytomas in the central nervous system, those of the brain have been well characterized (6), whereas intraspinal hemangiopericytomas remain relatively obscure in their clinical features and course.

We found 21 cases of intraspinal hemangiopericytoma in the literature in which age, gender, and the location were documented (2-5, 7-16). Including the present case, there were 14 males and eight females with an average age of 38.3 years (range, 11-65 years). Ten tumors were located in the cervical spine, six in the thoracic spine, and six in the lumbar spine. There were 14 extradural and six intradural tumors (unknown in two cases). Primary symptoms were radicular pain and paresis with durations from one week to three years before admission. Surgical treatment was undertaken in all 22 cases including laminectomy alone in two and laminectomy with tumor resection in 20 cases, three of which were combined with preoperative embolization. Postoperative radiation was employed in eight cases and a combination of radiation and chemotherapy in one case.

Five out of eight cases that had the minimal follow-up period of three years after tumor resection exhibited local recurrence (4,5,8,9,15, and the present case). Duration from surgery to recurrence was three (two cases), four, six, and 11 years. Four out of the five cases with recurrence had been treated with radiation. Metastasis was found in the lung in one case following local recurrence that occurred 11 years after initial surgery (5). None of the patients were dead on disease. Five-year local recurrence and metastasis

rates were 40% and 0%, respectively. By comparison, recurrence and metastasis rates for hemangiopericytomas of the central nervous system were reportedly in the range of 65% and 33%, respectively, and the bones and liver were the most common metastatic sites (6,17).

The fundamental problem for treatment of hemangiopericytomas in the spinal canal is the same as in other sites, namely the difficulty in achieving wide surgical resection due to the local invasiveness and the marked vascularization of the neoplasm. The unique anatomic structure of the vertebral column further increases the difficulty. Preoperative embolization was as helpful in preventing profuse bleeding during surgery in the present case as it was for Muraszko *et al.* (5). Postoperative radiation did not seem to play an important role, since four out of five cases recurred despite having received this treatment. It was difficult to estimate the efficacy of chemotherapy in the case with only a two-year follow-up (14), but generally it was insignificant for hemangiopericytoma (1,6,17). Therefore, more aggressive surgical procedures such as tumor resection with the adherent dura mater as well as with the total structure of affected vertebrae should be considered for the treatment of hemangiopericytoma in the spinal canal.

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