# Thoracic spinal meningioma

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A thoracic spinal meningioma is a type of thoracic spinal tumor that develops in the membranes surrounding the spinal cord within the thoracic region of the spine. Meningiomas are typically slow-growing tumors that arise from the arachnoid cells of the meninges, which are the protective coverings of the brain and spinal cord.

## Epidemiology

see Spinal meningioma epidemiology.

#### Classification

see Spinal meningioma classification.

#### Diagnosis

see Spinal meningioma diagnosis.

#### Treatment

see Spinal meningioma treatment

#### **Case series**

#### see also Spinal meningioma case series

Thirty-nine patients with thoracic spinal meningiomas received keyhole surgery from May 2013 to June 2017 in the Department of Spine Surgery, Fujian Provincial Hospital. A working channel with a diameter of 1.8 cm was inserted percutaneously about 2.0 to 3.5 cm away from the mid-line. Dorsally attached tumors were resected with hemilaminectomy fenestration; for the spinal meningiomas located in the lateral side of the spinal cord, hemilaminectomy combined with partial facetectomy were used; hemilaminectomy combined with hemifacetectomy fenestration were used for spinal meningiomas located ventrally. No internal fixation was performed in all cases. Clinical outcome was assessed using the visual analog scale (VAS) for pain relief and the American Spinal Injury Association Impairment Scale for evaluation of the function of the spinal cord after surgery. The pre-and postoperative data were compared by paired t test. Among the 39 patients, the tumors in 36 cases located in the thoracic spine and 3 in the cervicothoracic junction. Complete resection was achieved in all patients. Mean operative time was (148±21) min (range, 120-185 min). Mean blood loss during surgery was (101±27) ml (range, 50-200 ml). No infection or aggravation of spinal cord injury occurred after operation, except for 3 patients who had postoperative cerebrospinal fluid leakage that recovered after conservative treatment. The mean hospital stay was  $(6.1\pm0.8)$  days (range, 5-9 days). Patients were followed-up for a period of 9 to 57 months, with a mean follow-up time of (29±13) months. At the last follow-up, all patients had a reduced level of pain as suggested by an average VAS score that improved from (7.38±1.71) to (0.31±0.63), the ASIA grade improved in all patients except for 2 cases (5.1%), 24 cases (61.5%) improved by 1 grade, 9 cases (23.1%) improved by 2 grades, and 4 cases (10.3%) improved by 3 grades. No evidence of tumor recurrence or secondary spinal instability was observed in any patients during the postoperative follow-up. Microscopic minimally invasive keyhole technique can be used to completely resect the thoracic spinal meningiomas; such surgical procedures convey reliable clinical outcomes and good postoperative spinal stability<sup>1)</sup>.

#### **Case reports**

A 35-year-old previously symptom-free woman presented sudden right sciatica and weakness of her right leg following a fall with impact to her left foot. A neurological examination showed paresis of the right quadriceps, tibial and sural muscles, increased bilateral knee and ankle reflexes and positive Babinski sign. Magnetic resonance imaging (MRI) revealed the presence of a spinal T11 meningioma in the left postero-lateral compartment of the spinal canal; at this level, the spinal cord was displaced to the contralateral side with the conus in the normal position. At surgery, a meningioma with dural attachment of the left postero-lateral dural surface was removed. The intervention resulted in rapid remission of both pain and neurological deficits. Spinal meningiomas may exceptionally present with sudden pain and neurological deficits as result of tumour bleeding or post-traumatic injury of the already compressed nervous structures, both in normal patients and in those with conus displacement or tethered cord. In this case, the traumatic impact of the left foot was transmitted to the spine, resulting in stretching of the already compressed cord and of the contralateral lombosacral roots. This case suggests that low thoracic cord compression should be suspected in patients with post-traumatic radicular leg pain with normal lumbar spine MRI.<sup>21</sup>.

Ossified-calcified intradural and extradural thoracic spinal meningioma with neural foraminal extension  $^{\scriptscriptstyle 3)}$ 

A case of intradural extramedullary spinal meningioma which recurred 16 years after the initial surgery on a 64-year-old woman. She presented with progressive neurological symptoms and had a surgical history of removal of thoracic spinal meningioma 16 years ago due to bilateral low leg weakness. She underwent a second operation at the same site and a pale yellowish tumor was excised, which was histopathologically confirmed as meningothelial meningioma, compared with previously transitional type. she showed neurological recovery after the operation. We, therefore, report the good results of this recurrent intradural spinal meningioma case developed after 16 years with literature review <sup>4)</sup>.

Extradural thoracic spinal meningioma <sup>5)</sup>.

A 15-year-old boy with thoracic spinal ossified meningioma. The meningioma was resected totally. Histopathological examination revealed a transitional meningioma (psammomatous+meningothelial). Immunohistochemically, Ki 67 antibody was applied but no positive staining was present <sup>6</sup>.

Paroxysmal sensory-motor attack as the only manifestation of thoracic spinal meningioma <sup>7</sup>.

Thoracic spinal meningioma associated with hydrocephalic dementia<sup>8)</sup>.

### **Case report from the HGUA**

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a patient who underwent surgical resection of a dorsal intradural extramedullary meningioma with subsequent postoperative epidural hematoma leading to paraplegia. The hematoma was urgently evacuated, resulting in significant neurological recovery. This case highlights the surgical technique, complication management, and postoperative rehabilitation in achieving favorable outcomes in complex spinal tumor cases.

Introduction Intradural extramedullary meningiomas are rare spinal tumors that require meticulous surgical planning due to their proximity to the spinal cord. Postoperative complications such as epidural hematomas, although uncommon, can have profound neurological implications. Here, we present a case involving the complete resection of a dorsal meningioma complicated by a postoperative epidural hematoma, emphasizing the surgical approach and urgent management strategies.

Case Presentation Patient Profile Age/Sex: [Insert age and sex]. Reason for Admission: Scheduled treatment of an intradural dorsal lesion. Medical History: Hypothyroidism (treated with Eutirox 88 mcg/day). Hypercholesterolemia. Family history of skin and bone cancer (mother). Surgical History: Basal cell carcinoma excised from the abdominal skin and nose. Clinical Findings Neurological symptoms included progressive weakness and sensory disturbances, correlating with a dorsal lesion detected on imaging. Preoperative MRI confirmed an intradural extramedullary meningioma at the D10 level.

Surgical Procedure Primary Surgery Approach: Prone positioning with BAG support. Radiographic localization of the D9-D10 intervertebral disc. Midline incision with bilateral paravertebral muscle separation. Laminoplasty involving osteotomies across three levels using a piezoelectric scalpel, with en bloc resection of posterior arches. Durotomy exposed a centrally located tumor with a right lateral dural implantation base and arachnoid plane involvement. Total resection of the lesion in a single block after coagulating the tumor base and dissecting it from the spinal cord (Simpson grade II). Dural closure was achieved with Gore-Tex 5/0 and reinforced with TachoSil. Posterior arches were repositioned and stabilized using Maxillaria miniplates. Layered closure was performed, and cerebrospinal fluid (CSF) was sent for cytological analysis. Complication Management Event: Postoperative paraplegia secondary to a dorsal epidural hematoma. Emergency Surgery: Reopening of the incision and laminoplasty. Evacuation of the epidural hematoma with minimal CSF leakage. Hemostasis achieved using Floseal. Refixation of the laminoplasty with Maxillaria screws and placement of bilateral Redon drains. Layered closure without intraoperative complications. Postoperative Evolution Initial Outcome: Successful total tumor resection. Complication: Postoperative paraplegia secondary to epidural hematoma, requiring urgent intervention. Recovery: Significant neurological improvement following hematoma evacuation. Neurological Examination at Discharge Motor Strength: Left: 4/5 in hip, 5/5 in knee and foot. Right: 3/5 in hip, knee, and foot. Reflexes: Bilateral patellar hyperreflexia with persistent Achilles clonus. Sensory Deficit: Hypoesthesia at D10 (right predominant) and perineal region. Sphincter Function: Absent anal sphincter tone. Rehabilitation and Follow-Up Rehabilitation Plan: Physiotherapy initiated at the rehabilitation service. Follow-Up Appointments: Neurocirurgery and urology consultations scheduled to monitor recovery. Activity Recommendations: Relative rest and avoidance of heavy lifting or physical strain. Discussion Spinal meningiomas, while typically benign, present challenges due to their proximity to the spinal

cord. Laminoplasty facilitates access while preserving structural integrity. Postoperative epidural hematoma is a rare but potentially catastrophic complication requiring prompt intervention to prevent irreversible neurological deficits.

Our approach, involving immediate evacuation of the hematoma and careful reconstruction, underscores the importance of vigilance in the postoperative period. This case exemplifies the role of multi-disciplinary management in optimizing functional outcomes.

Conclusion This case highlights the successful management of an intradural extramedullary meningioma complicated by a postoperative epidural hematoma. Early recognition of complications and prompt surgical intervention are critical for recovery. Further research is warranted to refine protocols for minimizing and managing such complications.

67-year-old woman

Breast cancer treated with tamoxifen.

Post-surgical hypothyroidism (total thyroidectomy).

Anemia with a diagnosis of low-grade Myelodysplastic Syndrome.

Lumbar canal stenosis.

Hypocalcemia

Dorsal pain along with symptoms of loss of strength and sensation, weakness in the lower limbs and lower abdomen, and recent postural instability. She also reports a sensation of coldness in the distal parts of the lower limbs. Difficulty urinating in the past few days, Despite being prescribed analgesia, the dorsal pain has not improved.



A tumor is found within the spinal canal at the D3 and D4 levels. It is an oval-shaped, well-defined mass measuring  $20 \times 13 \times 9$  mm. The tumor appears dark on T1 and T2 imaging and slightly brighter on fat suppression. It is located on the right and posterior side of the spinal canal and shows strong enhancement with contrast. The tumor is causing displacement and compression of the spinal cord, resulting in a slight increase in signal intensity on fat suppression.

Midline incision from D2 to D5. Bilateral subperiosteal muscle dissection at D3-D4. Laminotomy of D3+D4 using an ultrasonic motor. Intraoperative ultrasound confirmation of tumor margins. Hemostasis with Floseal. Midline dural opening while preserving the arachnoid membrane. Arachnoid opening and cerebrospinal fluid (CSF) sampling for cytology. Dural distraction using Vicryl sutures. Identification of encapsulated grayish lesion with a good plane of separation from the spinal cord/nerve root, suggestive of meningioma, located on the posterolateral aspect of the dura mater. An intraoperative sample was taken for pathological analysis confirming meningioma. Microsurgical dissection of the spinal cord and nerve root plane. Debulking performed. Dissection of the implantation zone with coagulation of the dura mater. Macroscopically complete resection. Hemostasis. Dural closure using Goretex 6.0 with continuous sutures. Valsalva maneuver performed without identifying fistula. Dural reinforcement with Tachosil + Tisucol. Laminoplasty using Synthes plates and screws. Closure by layers. Skin closure with continuous monofilament sutures.

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