Spinal Neurosurgery

THORACIC SPINAL EPIDURAL ANGIOLIPOMA:

A Rare Case Report and Review of the Literature

BELGACEM Ibrahim [1], DJOUADI Yasmina[1], HABCHI Nawel[2], ABOUADJBAL Mohamed[1], IZIROUEL Karim [3] and AIT BACHIR Mustapha [1]

1: Neurosurgery Department, University Hospital Nadir Mohamed, Tizi Ouzou, Algeria
2: Neurosurgery Department, Frantz Fanon University Hospital Center, Blida, Algeria.
3: Neurosurgery Department, Mustapha Pacha University Hospital, Algiers, Algeria

**Corresponding Author: BELGACEM I.,Neurosurgery Department, University Hospital Nadir Mohamed Tizi Ouzou, Algeria*

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ABSTRACT

Spinal epidural angiolipomas are extremely rare benign tumors composed of mature adipose tissue and abnormal vascular structures. Their slow but progressive growth may cause significant spinal cord compression, leading to neurological deficits. We report the case of a 48-year-old woman with no notable medical history who was admitted for progressive paraparesis due to a thoracic epidural angiolipoma located at the **T4–T5** level. The diagnosis was suspected on magnetic resonance imaging (MRI) and confirmed by histopathological examination after complete surgical excision. Postoperative recovery was favorable, with gradual improvement in motor function. This case highlights the importance of early diagnosis and appropriate management, as well as the distinctive features of this underrecognized entity.

Keywords: *epidural angiolipoma; spinal cord compression; thoracic spine MRI; benign tumor; spinal surgery*

INTRODUCTION

Benign tumors of the spine are diverse; however, spinal angiolipomas constitute a particularly rare entity. First described by Berenbruch in 1890, these tumors were recognized as a distinct clinicopathological entity only in 1960 by Howard and Helwig [13,14]. To date, approximately 130 cases of thoracic spinal epidural angiolipomas have been reported worldwide, underscoring their extreme rarity [1,2,6–12].

Angiolipomas consist of a mixture of mature adipose tissue and dilated vascular structures. They are usually found in subcutaneous tissues, particularly in the trunk or extremities. Spinal localization, although exceptional, may have major clinical consequences due to compression of the spinal cord or nerve roots. Clinical presentation varies according to tumor size and location, but symptoms are typically chronic, insidious, and progressive.

Here, we report a new case of a posterior thoracic epidural angiolipoma diagnosed in a 48-year-old woman and treated surgically, followed by a focused review of the literature.

CASE REPORT

A 48-year-old woman with no significant past medical history presented with progressive weakness of both lower limbs for approximately two months. She reported a sensation of heaviness and early fatigability while walking, without back pain and without associated sphincter dysfunction.

Neurological examination revealed **spastic paraparesis**, graded **3/5** in both lower limbs according to the Medical Research Council (MRC) scale, with increased deep tendon reflexes, moderate spasticity, and **bilateral Babinski signs**, without clear objective sensory loss.

Thoracic spine MRI demonstrated a **well-circumscribed posterior epidural mass** at the **T4–T5** level, measuring approximately **2.5 cm** along its longest axis. The lesion was **hyperintense on T1-weighted images** and **hyperintense on T2-weighted images**, with **homogeneous enhancement** following gadolinium administration, suggesting a benign lesion with fatty and vascular components (Fig. 1).

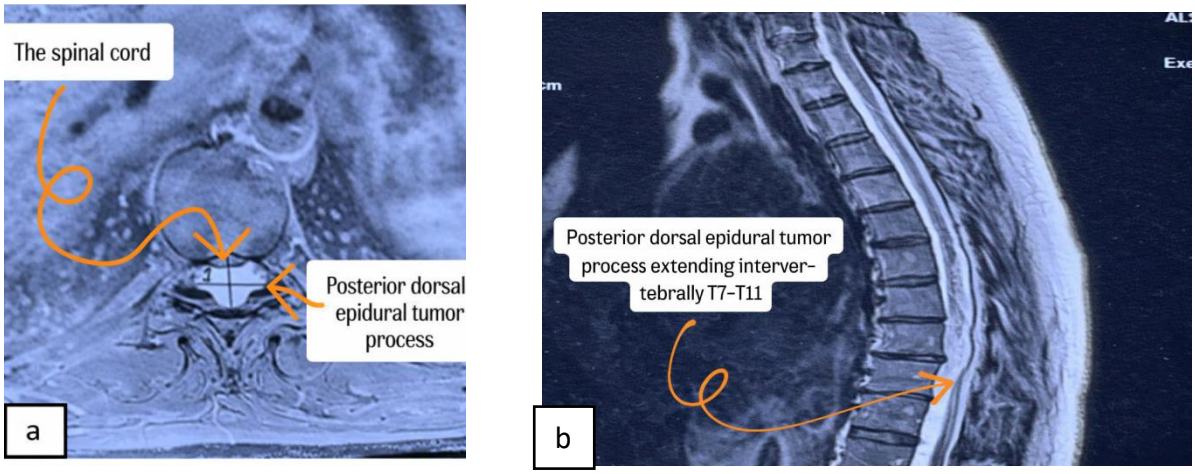

Figure 1:

(a) Axial T2-weighted thoracic spine MRI showing a posterior epidural mass (arrow) compressing and displacing the spinal cord anteriorly.
(b) Sagittal T2-weighted thoracic spine MRI showing a posterior epidural lesion extending from **T7 to T11**, causing progressive spinal cord compression.

A **laminectomy from T6 to T12** was performed. Intraoperatively, the tumor was **encapsulated**, **soft**, and **well demarcated** from adjacent structures, allowing **macroscopically complete resection**. Histopathological examination revealed **mature adipose tissue** containing **dilated vascular spaces**, without cellular atypia and without evidence of osseous or dural infiltration, confirming the diagnosis of a **non-infiltrating spinal epidural angiolipoma** (Fig. 2).

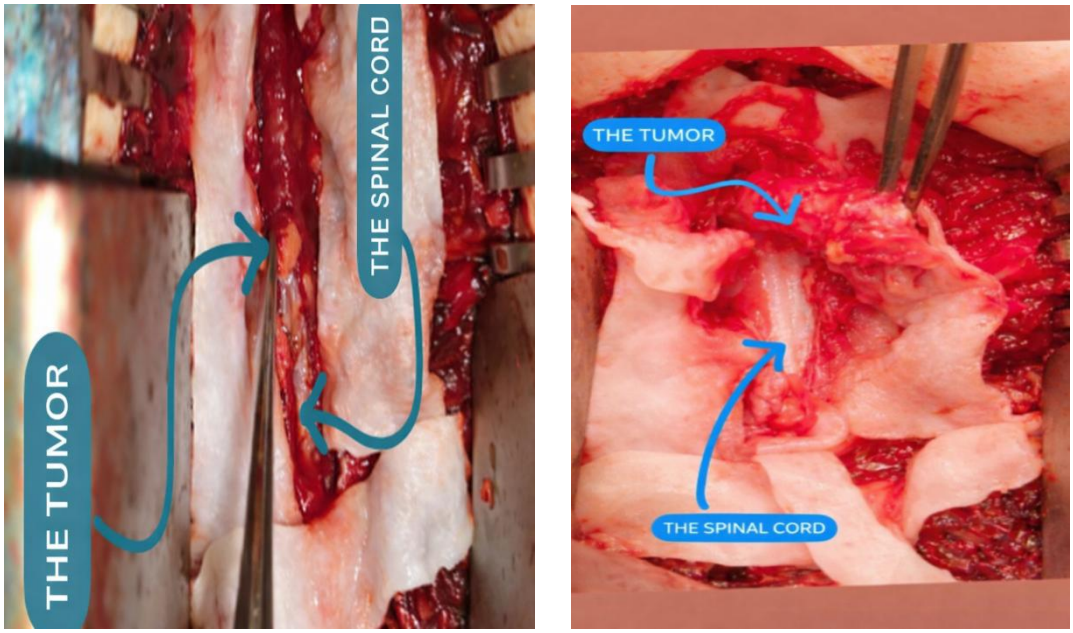

Figure 2: Intraoperative view after laminectomy showing the tumor (arrow) during excision and its separation from the spinal cord.

The postoperative course was uneventful. Motor function improved progressively, reaching **4/5** two weeks after surgery, with recovery of independent ambulation. No evidence of recurrence was detected on clinical and radiological follow-up at three months.

DISCUSSION

Epidemiology and Etiopathogenesis

Spinal angiolipomas are exceptionally rare and represent less than **3%** of extradural spinal tumors [2]. The mid-thoracic region is the most frequently involved site, likely due to the relative abundance of epidural fat in this area. A marked female predominance has been reported, suggesting hormonal influence [1], consistent with our case.

The exact pathogenesis remains debated. Some authors consider angiolipomas to be vasculolipomatous hamartomas, whereas others regard them as benign mixed neoplasms with a variable, sometimes predominant, vascular component.

Classification

Two histological types are described:

- **Non-infiltrating:** well encapsulated, confined to the posterior epidural space, and readily resectable.

- **Infiltrating:** poorly circumscribed, with possible extension into vertebral bodies and occasionally paravertebral structures [5,12].

Infiltrating lesions may be locally more aggressive, yet they retain benign histological behavior. In our case, there was no evidence of spinal cord infiltration or osseous involvement, consistent with a non-infiltrating, well-encapsulated lesion.

Clinical Presentation

Symptoms are typically progressive and may include motor deficits, sensory disturbances, sphincter dysfunction, or clonus. Back pain is inconstant. Sudden neurological deterioration due to intralesional hemorrhage or vascular thrombosis has been reported [6]. During pregnancy, symptom exacerbation is well documented, likely related to increased epidural venous congestion and hormonal effects [6].

Imaging

MRI is the imaging modality of choice:

- **T1:** typically hyperintense, sometimes heterogeneous.
- **T2:** variable, often hyperintense.
- **Post-gadolinium:** homogeneous or mixed enhancement reflecting tumor vascularity.

A central area of T1 hypointensity may suggest a predominant vascular component [3,17].

Management

Surgical excision is the treatment of choice, aiming for complete resection. In most cases, a posterior approach with laminectomy is sufficient. In infiltrating forms, wider resection may be required and can occasionally necessitate spinal reconstruction.

Neurological recovery is frequently excellent, even in the presence of significant preoperative deficits. Radiotherapy is not indicated because the lesion is benign and recurrence after complete excision is exceptionally rare.

CONCLUSION

Although rare, thoracic spinal epidural angiolipomas should be considered in the differential diagnosis of unexplained progressive paraparesis. MRI provides reliable diagnostic guidance; however, definitive diagnosis requires histopathological confirmation after surgical excision. Postoperative prognosis is excellent, with a very low risk of recurrence. This case supports the value of early recognition and timely neurosurgical management to prevent persistent neurological deficits.

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