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Spinal Teratoma in an Adult Female Patient: A Case Report

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Abstract

Spinal teratomas are rare neoplasms derived from at least two of the three embryonic germ layers, representing rare spinal tumors outside the sacrococcygeal region. Adult intramedullary cases are exceptionally uncommon and often present with nonspecific symptoms, making diagnosis challenging. A 32-year-old female presented with low back pain radiating to both legs, lower limb numbness, and progressive left leg weakness with gait disturbance. Magnetic resonance imaging (MRI) revealed a well-encapsulated intramedullary lesion at the conus medullaris (T11-L1) with predominantly fat-equivalent signal intensity, hyperintense on both T1- and T2-weighted images, cystic components, and calcification, suggestive of teratoma. The patient underwent laminectomy and subtotal microsurgical resection. Histopathology confirmed a mature teratoma. Adult intramedullary spinal teratomas are rare lesions that should be considered in the differential diagnosis of conus medullaris tumors. MRI is essential for preoperative evaluation, while histopathology establishes the diagnosis. Radical excision is the treatment of choice, although subtotal resection may be warranted in functionally critical regions. The patient was followed for 12 months: gait improved after surgery, a much milder lower spastic paraparesis persisted, and the residual tumor was unchanged on MRI.

Categories: Neurology, Pathology, Neurosurgery
Keywords: case report, conus medullaris, histopathology, intramedullary tumor, mature cystic teratoma, mri, spinal cord compression, spinal teratoma, subtotal microsurgical resection, thoracic spine

Introduction

Teratomas are rare neoplastic/germ cell lesions composed of tissues derived from at least two of the three embryonic germ layers, arising from ectopic growth [1,2]. Their occurrence within the spinal cord in adults is extremely uncommon, accounting for fewer than 0.5% of all spinal tumors outside the sacrococcygeal region [3,4]. Intramedullary spinal teratomas are slow-growing neoplasms that are rarely present for the first time in adulthood. Their histogenesis remains debated, with theories ranging from misplaced germ cells to dysembryogenesis of pluripotent cells during neural tube closure [5-8]. Because of their rarity and nonspecific clinical presentation, these lesions are frequently misdiagnosed preoperatively, and their optimal management is still a matter of discussion. Histologically, they are classified as mature, immature, or with malignant transformation, and may occur in intramedullary, intradural extramedullary, or extradural locations [4,5].

We report the case of a 32-year-old female with nonspecific neurological complaints, ultimately diagnosed with an intramedullary teratoma of the conus medullaris, accompanied by a review of the relevant literature. We present this case not because intramedullary spinal teratoma is an entirely new entity, but because it remains an uncommon and clinically important diagnosis, and we wish to share our experience with its evaluation and surgical treatment. The patient was followed for 12 months.

Case Presentation

A 32-year-old white Bulgarian female patient was admitted in December 2024 to the Clinic of Neurology of the University Hospital "St. Marina", Varna, Bulgaria. The patient presented with several months of intermittent numbness in both legs, followed by severe low back pain radiating to the posterolateral aspect of both legs. In the four to five days before admission, numbness of the left leg progressed from the ankle to the knee, and for two days she had left leg weakness, with the leg giving way while walking and two falls. Neurological examination showed lower spastic paraparesis, hyperreflexia in the lower limbs, more exaggerated on the right, and a positive Babinski sign bilaterally. Sensory examination showed hyperaesthesia in the T11-T12 dermatomes bilaterally and hypoaesthesia in the left L4-L5 dermatomes; sphincter function was preserved. Computed tomography (CT), performed as part of the diagnostic workup,

revealed a lesion within the spinal canal at T11-L1. The patient was subsequently referred to the Clinic of Neurosurgery for further evaluation and management. Physical examination revealed no cutaneous abnormalities. No palpable midline spinal defects were noted. Past medical history included right-convex scoliosis and congenital right pes equinovarus. The patient reported no prior lumbar surgeries or lumbar punctures. No previous family history or genetic disorders were reported. Routine laboratory blood tests were within the normal range, with no abnormalities. Informed consent for publication of this case and the accompanying images was obtained from the patient. Magnetic resonance imaging (MRI) showed an intramedullary lesion at the level of the conus medullaris (T11-L1), measuring 22.3 × 17.4 mm in the axial plane and 41 mm craniocaudally, with lobulated contours. The lesion showed predominantly fat-equivalent signal intensity, hyperintense on both T1- and T2-weighted images (T2-weighted images, Figure *1*), and hypointense on fat-suppressed sequences. Areas of heterogeneous signal were noted, more pronounced in the caudal one-third, where septations and possible small solid components were present. After contrast administration, fat-suppressed T1-weighted images showed mild peripheral enhancement.

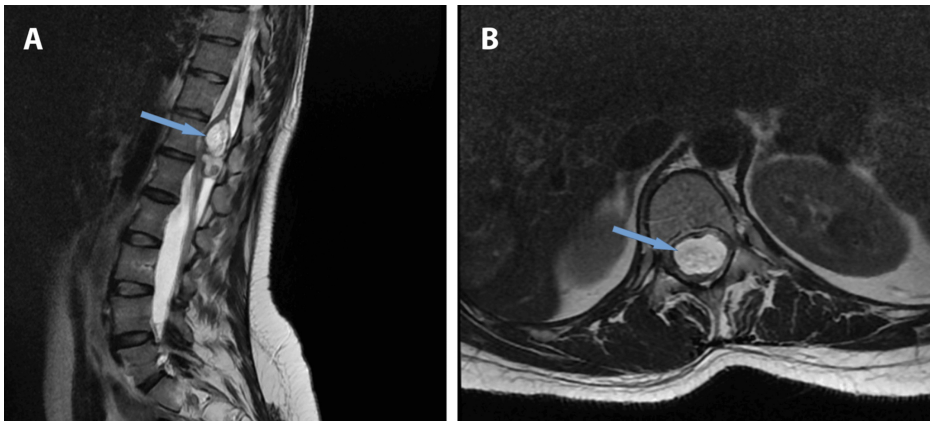


FIGURE 1: Sagittal (A) and axial (B) T2-weighted thoracolumbar MRI showing an intramedullary lesion (arrow) at the conus medullaris (T11-L1).

MRI: magnetic resonance imaging

On thoracolumbar CT, the lesion measured 22 × 15 mm axially and 49 mm craniocaudally, was predominantly of fat density, and showed a small peripheral calcified area located in the middle third, ventrally and to the right. Differential diagnosis includes spinal dermoid cyst of the conus medullaris versus spinal teratoma (Figure *2*).

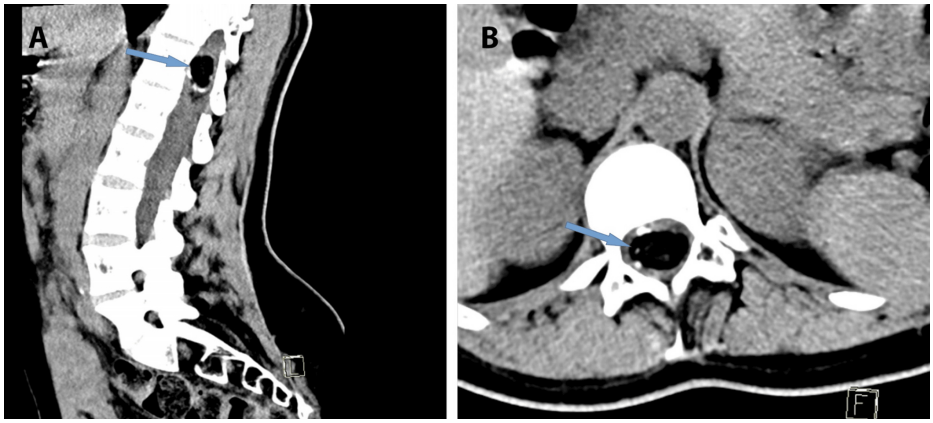


FIGURE 2: CT scan showing the lesion in sagittal and axial plane: (A) sagittal thoracolumbar spine CT scan showing a small peripheral calcified area (arrow) located in the middle third, ventrally and to the right; (B) axial thoracolumbar spine CT scan showing a small peripheral calcified area (arrow) located in the middle third, ventrally and to the right.

CT: computed tomography

Based on the review of medical documentation, clinical presentation, and imaging studies, the patient was discussed at a multidisciplinary clinical consilium. The lesion was considered to be a spinal cord tumor, with teratoma as the most likely diagnosis. Surgical resection was indicated for neurological improvement and histological verification.

Under general anesthesia, a midline skin incision was made from T11 to L1 vertebrae. Bilateral paravertebral muscle dissection was performed to expose the posterior elements. Using microsurgical techniques under optical magnification, laminectomy of the T11, T12, and L1 vertebrae was performed, followed by durotomy. A large multilobulated cystic lesion was revealed compressing the neural structures (Figure *3*). A subtotal resection of the lesion and decompression was performed, due to the tumor's adherence to functionally critical structures, where further dissection carried a high risk of significant neurological deficit. The resection was assisted by intraoperative ultrasound; intraoperative neuromonitoring was not used. Careful hemostasis was achieved, and a haemostatic matrix (Surgiflo) was applied. The dura was reconstructed and sealed using Duragen and DuraSeal. A subcutaneous tubular drain was placed, and the soft tissues were closed in anatomical layers. There were no intraoperative complications.

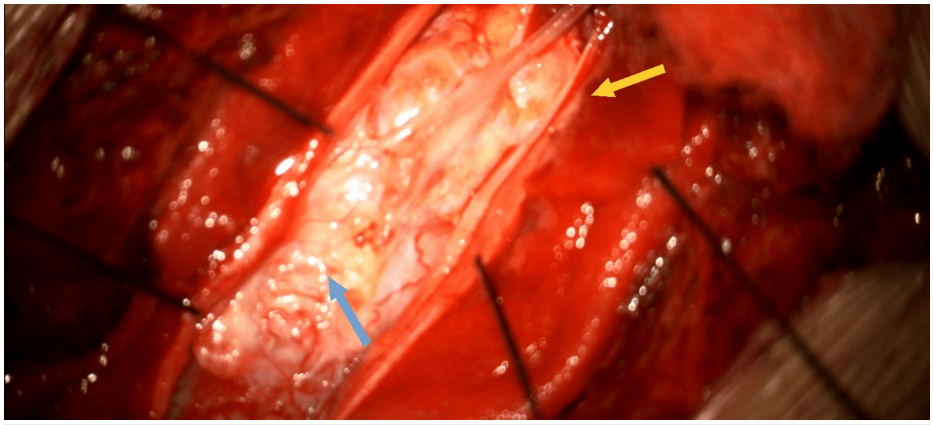


FIGURE 3: Intraoperative image of the tumor: a large multilobulated cystic lesion (blue arrow) after durotomy, with the dural edges retracted by stay sutures (yellow arrow).

The postoperative course was uneventful. The patient awoke without new neurological deficits, and lower

limb motor function was preserved. A mild improvement in gait stability was noted in the early postoperative days. Pain was effectively managed with standard analgesic therapy. The surgical wound healed primarily, with no signs of cerebrospinal fluid leakage or infection. Mobilization was initiated on the first postoperative day, followed by a tailored physiotherapy program focused on gait training and strengthening of the lower extremities. The patient was discharged on the sixth postoperative day in good general condition, with instructions to continue physiotherapy and attend regular outpatient follow-up for neurological and radiological assessment. At three months, gait had improved compared with presentation; a milder lower spastic paraparesis, more pronounced on the left, persisted, and MRI showed residual tumor. Further surgery was not indicated, and physiotherapy was continued. At 12 months, gait remained improved with a much milder residual paraparesis, and MRI showed no change in the residual tumor. The clinical course is summarized in Table *1*.

Time	Event
Several months before admission	Intermittent numbness in both legs
Weeks before admission	Severe low back pain radiating to both legs
4–5 days before admission	Progressive left leg numbness; left leg weakness and two falls in the last two days
December 2024	Clinic of Neurology: lower limb pyramidal signs, sensory disturbance, preserved sphincter function; CT: fat-density lesion with peripheral calcification at T11-L1
Late December 2024 to early January 2025	Clinic of Neurosurgery: contrast-enhanced MRI showing an intramedullary conus medullaris lesion; multidisciplinary discussion, teratoma considered most likely
January 2025	T11-L1 laminectomy and ultrasound-assisted subtotal microsurgical resection; no complications
Postoperative day 1	Drain removed; mobilization and physiotherapy started; no new neurological deficit
Postoperative day 6	Discharge with neurological improvement; histopathology: mature teratoma
3 months	Improved gait; milder lower spastic paraparesis, more pronounced on the left; MRI: residual tumor; physiotherapy
12 months	Gait remains improved with a much milder residual paraparesis; MRI: residual tumor unchanged; no indication for further surgery

TABLE 1: Timeline of the clinical course.

CT: computed tomography; MRI: magnetic resonance imaging

Histopathological examination of the mass revealed tissues derived from at least two germ layers: an epithelial component and mesodermal tissues (adipose, fibrous, and smooth muscle). The epithelial component was represented by cystic spaces lined with multilayered cuboidal epithelium containing amorphous eosinophilic material within the lumen; the mesenchymal component comprised mature adipose and fibrous tissue, nerve fibers, and scant smooth muscle fibers. No immature or malignant elements were identified. Immunohistochemistry was not performed; the diagnosis was based on hematoxylin and eosin morphology. The final diagnosis was a mature cystic teratoma (Figure *4*).

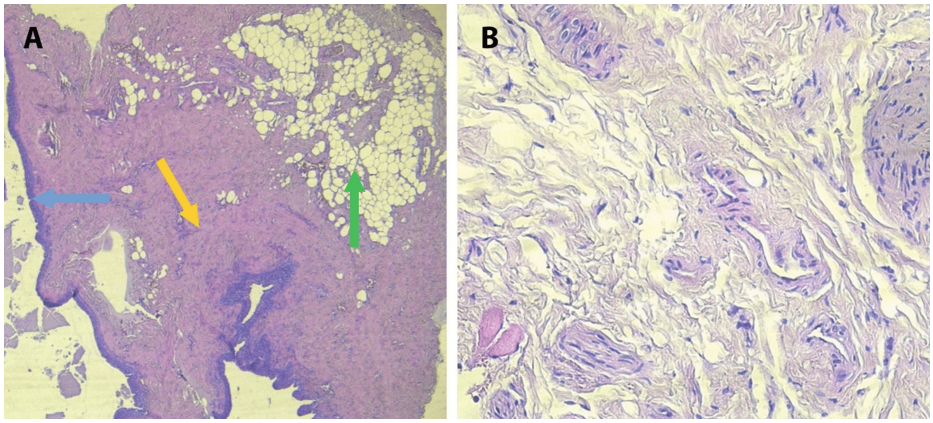


FIGURE 4: Histopathological images of the tumor: (A) tissues derived from at least two germ layers (epithelial component) represented by cystic spaces lined with multilayered cuboidal epithelium containing amorphous eosinophilic material within the lumen; mature adipose and fibrous tissue (H&E, ×40); (B) a fragment composed solely of mesenchymal tissue, including mature adipose and fibrous tissue, nerve fibers, and scant smooth muscle fibers (H&E, ×200). In A, the blue arrow indicates the epithelial lining of the cyst, the yellow arrow mesoderm-derived fibrous tissue, and the green arrow mesoderm-derived adipose tissue.

H&E: hematoxylin and eosin

Discussion

This case report is important because it highlights the need to consider all possible causes of intramedullary lesions, including rare ones like teratomas, as this can greatly influence surgical planning. Making the diagnosis can be difficult due to the nonspecific symptoms, especially when no associated spinal malformations are present. This case shows the challenges of diagnosing and treating rare spinal cord tumors, underlining the variety of symptoms, the value of teamwork between different specialists, and the importance of monitoring the patient's recovery after surgery and other treatments.

Spinal teratomas are rare lesions composed of tissues derived from at least two of the three embryonic germ layers [3]. They are classified according to the degree of differentiation as mature or immature and may also harbor malignant elements [4].

Adult spinal cord teratomas exhibit a broad spectrum of clinical manifestations, with the presentation largely determined by the anatomical location of the lesion (cervical, thoracic, or lumbar segments) and the extent of involvement (intramedullary, intradural extramedullary, or extradural) [5]. The intramedullary lesion at the level of the conus medullaris in our patient was associated with low back pain radiating to both legs, lower limb numbness, and, eventually, left leg weakness with gait disturbance.

In 2009, Sharma et al. reported a clinicopathological series of 27 patients with spinal teratomas collected over a 20-year period and observed a male predominance in both children and adults [6]. Although spinal teratomas show an overall male predominance, mature teratomas have also been reported in young women; our patient fits the latter pattern [7].

In a comprehensive review published in 2020, Prasad and Divya identified fewer than 150 reported cases of adult spinal teratoma in the literature [8]. The mean patient age was 39.6 years (range: 18-85 years); limb weakness and back pain were the most common presenting symptoms, and most lesions were intramedullary and located in the thoracolumbar region. Complete resection was achieved in 45% of cases, and the authors emphasized that subtotal resection is often unavoidable because of adherence to functionally critical neural tissue. Our 32-year-old patient fits this epidemiological profile in age and tumor location, but presented with an acute deterioration (left leg weakness and falls) after several months of intermittent lower limb numbness, underscoring the variable clinical behavior of these lesions.

On imaging, spinal teratomas typically present as well-encapsulated lesions with both solid and cystic

components, often containing areas of fat signal and calcification [9]. Differentiating teratomas from other spinal cord tumors based solely on imaging can be challenging. CT may reveal calcifications or heterogeneous densities within the mass, while MRI remains the modality of choice. On MRI, these tumors usually appear as cystic or lobulated lesions with variable signal intensities reflecting their mixed solid and cystic composition [10]. MRI is particularly valuable for localizing the lesion, distinguishing intramedullary from extramedullary involvement, and aiding in preoperative planning.

Radical surgical excision remains the treatment of choice for spinal teratomas, although subtotal resection should be considered when the tumor is located in functionally critical areas [9]. In our case, only subtotal resection was possible because of the tumor's adherence to functionally critical structures, where further dissection carried a high risk of significant neurological deficit. This decision reflects the widely accepted principle that preservation of neurological function takes precedence over the completeness of resection in benign, slow-growing lesions of the conus medullaris.

Because mature teratomas are histologically benign and slow-growing, the prognosis after subtotal resection is generally favorable, although residual tissue carries a recognized risk of gradual regrowth and symptomatic recurrence over long-term follow-up [8]. For this reason, regular clinical and radiological surveillance is warranted. In our patient, gait remained improved, and the residual tumor was unchanged on MRI 12 months after surgery. Continued annual imaging is planned to detect any recurrence at an early, treatable stage.

Conclusions

In this patient, subtotal resection of a mature intramedullary teratoma adherent to critical structures improved gait without new neurological deficit, and the residual tumor remained unchanged on MRI at 12 months. Because residual tumor carries a risk of regrowth, long-term clinical and radiological surveillance is required. Adult intramedullary spinal teratoma should be considered in the differential diagnosis of conus medullaris lesions.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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Supervision: Yanko G. Yankov, Angel A. Parushev, Yavor P. Enchev, Bogomil P. Iliev, Mustafa M. Ali, Deyan L. Dzhenkov

Disclosures

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References

1. Shrestha A, Bijukachhe B, Khan JA, Dahal RK, Yadav SK: Spinal intradural intramedullary mature cystic teratoma in a young adult: a rare tumor. Case Rep Orthop. 2022, 2022:9365719. 10.1155/2022/9365719

2. Ghostine S, Perry E, Vaynman S, et al.: The rare case of an intramedullary cervical spinal cord teratoma in an elderly adult: case report and literature review. Spine (Phila Pa 1976). 2009, 34:E973-8. 10.1097/BRS.0b013e3181ba0fe5
3. Li Y, Yang B, Song L, Yan D: Mature teratoma of the spinal cord in adults: an unusual case . Oncol Lett. 2013, 6:942-6. 10.3892/ol.2013.1519
4. Gaillard F, Kearns C: Spinal teratoma. Radiopaedia. 2025, 10.53347/rID-209240
5. Zavala-Romero L, Villanueva-Castro E, Datta-Banik R, Ortiz-Altamirano AG, Rodriguez-Esquivel MM, Cienfuegos-Meza J, Arriada-Mendicoa JN: Mature teratoma at the lumbar spinal cord: a case report and literature review. Cureus. 2024, 16:e52307. 10.7759/cureus.52307
6. Sharma MC, Jain D, Sarkar C, et al.: Spinal teratomas: a clinico-pathological study of 27 patients . Acta Neurochir (Wien). 2009, 151:245-52. 10.1007/s00701-009-0212-x
7. Cunningham C, Flores C, Dabecco R, Nisarga P, Ahn J, Williamson R: Symptomatic mature teratoma of the lumbar spine: a case report. Surg Neurol Int. 2022, 13:16. 10.25259/SNI_845_2021
8. Prasad GL, Divya S: A comprehensive review of adult onset spinal teratomas: analysis of factors related to outcomes and recurrences. Eur Spine J. 2020, 29:221-37. 10.1007/s00586-019-06037-7
9. Arora S, Chumber S, Vani K: Intramedullary teratoma of spine in an adult patient . J Belg Soc Radiol. 2022, 106:84. 10.5334/jbsr.2835
10. Monajati A, Spitzer RM, Wiley JL, Heggeness L: MR imaging of a spinal teratoma . J Comput Assist Tomogr. 1986, 10:307-10. 10.1097/00004728-198603000-00025