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Case Report
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Thoracic Intradural Extramedullary Arachnoid Cyst Presenting with Neurogenic Claudication

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Abstract

Background: Spinal arachnoid cysts are rare, benign cerebrospinal fluid–filled lesions that may cause spinal cord or nerve root compression. They are most frequently located in the thoracic region and typically present with a slow, insidious clinical course.

Case Description: We report the case of a 52-year-old man presenting with a 3-4-year history of progressive back pain and markedly reduced walking distance consistent with neurogenic claudication–like symptoms. Neurological examination was unremarkable, and lumbar Magnetic Resonance Imaging (MRI) failed to demonstrate explanatory pathology. Thoracic MRI revealed an intradural extramedullary cystic lesion at the T9–T10 level, causing anterior displacement of the spinal cord. The lesion was hypointense on T1-weighted and hyperintense on T2-weighted sequences and showed no contrast enhancement. The patient underwent thoracic laminectomy with complete cyst excision under intraoperative neuromonitoring. Histopathological analysis confirmed a benign arachnoid cyst. Postoperative MRI demonstrated complete decompression, and the patient experienced marked clinical improvement, remaining symptom-free at six-month follow-up.

Conclusion: Thoracic intradural extramedullary arachnoid cysts may present with atypical symptoms mimicking lumbar spinal stenosis, even in the absence of neurological deficits. In patients with neurogenic claudication and normal lumbar imaging, evaluation of the thoracic spine should be considered. Early surgical decompression can result in excellent clinical outcomes.

Keywords: Spinal Arachnoid Cyst; Neurogenic Claudication; Magnetic Resonance Imaging; Surgery

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Introduction

Spinal arachnoid cysts are uncommon, benign cerebrospinal fluid–filled lesions arising within the arachnoid membrane and can occur anywhere along the spinal axis, though they are most frequently encountered in the thoracic region. These lesions may be extradural, intradural extramedullary, or intramedullary, with intradural extramedullary cysts being particularly rare [1]. The etiology of arachnoid cysts remains incompletely understood; proposed mechanisms include congenital anomalies, inflammatory arachnoid adhesions, trauma, subarachnoid hemorrhage, and iatrogenic causes [2, 3].

Clinical presentations vary widely, ranging from asymptomatic incidental findings to symptoms related to spinal cord or nerve root compression, such as chronic back pain, sensory disturbances, motor weakness, gait abnormalities, and sphincter dysfunction. Symptom severity correlates with cyst size, location, and the degree of cord compression. In many cases, especially those involving thoracic intradural cysts, insidious progressive myelopathy and gait disturbances dominate the clinical Picture [2]. Imaging with MRI is essential for diagnosis, typically revealing non–contrast-enhancing cystic lesions that are hypointense on T1-weighted and hyperintense on T2-weighted sequences [4, 5].

Surgical intervention is generally indicated for symptomatic patients or those with progressive neurological deficits, with goals focused on decompressing the spinal cord and excising or fenestrating the cyst. Complete resection when feasible is associated with favorable outcomes, though shunting procedures may be considered for recurrent or unresectable cysts [2, 6]. In this report, we describe a case of a thoracic intradural extramedullary arachnoid cyst presenting predominantly with neurogenic claudication symptoms, successfully treated with surgical decompression.

Case

A 52-year-old male patient presented with a 3-4-year history of low back and thoracic pain. He reported progressively worsening limitation in walking distance and difficulty standing for prolonged periods. His walking distance had decreased to less than 100 meters, and he was able to stand for only 5-10 minutes. His past medical history was unremarkable for hypertension, diabetes mellitus, rheumatoid arthritis, prior significant infections, or trauma.

Neurological examination revealed normal motor and sensory function. Deep tendon reflexes were normoactive, and bilateral plantar responses were flexor. Lumbar Magnetic Resonance Imaging (MRI) did not demonstrate any pathology that could explain his clinical symptoms. However, thoracic MRI revealed a lesion at the Th 9-10 level compressing the spinal cord anteriorly. The lesion appeared hypointense on T1-weighted images and hyperintense on T2-weighted images (Figure 1). The lesion measured 53×13×19 mm in size. To further evaluate the differential diagnosis, contrast-enhanced thoracic MRI was performed; the lesion showed no contrast enhancement.

The patient subsequently underwent thoracic laminectomy under intraoperative neuromonitoring. Upon midline durotomy, cystic structures protruding outward were observed. These lesions were excised with the assistance of a neuromonitoring probe. Specimens were obtained for histopathological examination, which revealed no evidence of malignant cells.

Follow-up MRI demonstrated complete removal of the lesion and restoration of the spinal cord to its normal anatomical position (Figure 2). The patient experienced marked clinical improvement and has remained symptom-free during six months of follow-up.

Discussion

Spinal arachnoid cysts are rare benign lesions of the spinal axis. Their pathogenesis remains controversial. Proposed mechanisms include congenital duplication or splitting of the arachnoid membrane, inflammatory adhesions following infection or hemorrhage, trauma, and prior surgical interventions, as summarized in recent comprehensive reviews [2, 4]. In our patient, the absence of prior trauma, infection, or surgical history supports a likely congenital or idiopathic origin.

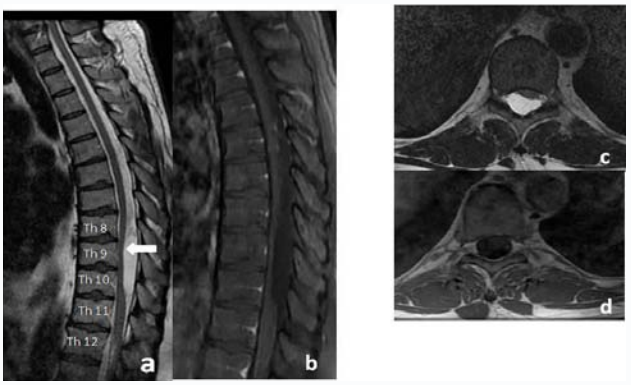

Figure 1: The patient's preoperative Magnetic Resonance Imaging (MRI) demonstrates the following findings: (a) On the T2-weighted sagittal image, a purely cystic lesion is observed, displacing the spinal cord anteriorly (white arrow indicates the lesion), (b) On the contrast-enhanced T1-weighted sagittal image, the lesion appears isointense with Cerebrospinal Fluid (CSF) and shows no contrast enhancement, (c) On the T2-weighted axial image, anterior displacement of the spinal cord is clearly evident and (d) On the contrast-enhanced T1-weighted axial image, the lesion is again isointense with CSF and demonstrates no contrast enhancement.

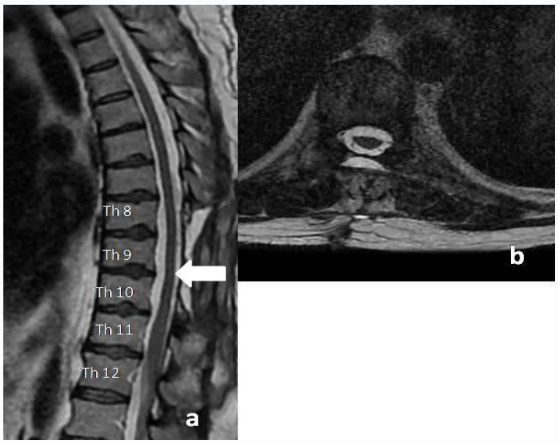

Figure 2: The patient's postoperative Magnetic Resonance Imaging (MRI) demonstrates the following findings: (a) On T2-weighted sagittal images, the spinal cord was observed in its normal anatomical location, and a laminectomy defect was evident (white arrow indicates the spinal cord) and (b) On T2-weighted axial images, the spinal cord was similarly seen in its normal position, and the laminectomy defect was clearly identified (Figure b).

Clinical manifestations vary according to cyst size, location, and degree of spinal cord compression. Progressive myelopathy, sensory disturbances, and gait impairment are among the most frequently reported symptoms [2]. Although spinal arachnoid cysts typically demonstrate a slow and insidious clinical course, the authors of a recently published case report described a thoracic spinal arachnoid cyst presenting with a fulminant progression [1]. Interestingly, our patient presented predominantly with neurogenic claudication–like symptoms, characterized by markedly reduced walking distance and intolerance to prolonged standing, despite a normal neurological examination. This presentation is atypical for thoracic arachnoid cysts and may lead to initial diagnostic confusion, particularly when lumbar imaging fails to reveal explanatory pathology.

Magnetic Resonance Imaging (MRI) remains the gold standard for diagnosis. Typical imaging characteristics include a well-defined, non–contrast-enhancing lesion that is hypointense on T1-weighted and hyperintense on T2-weighted sequences, consistent with cerebrospinal fluid signal intensity. These features help differentiate arachnoid cysts from neoplastic, infectious, or inflammatory lesions [2, 4]. In our case, contrast-enhanced MRI was essential to exclude enhancing intradural tumors such as meningioma or schwannoma. The systematic review by Kalsi et al., emphasizes the importance of MRI not only in diagnosis but also in surgical planning and postoperative follow-up [4].

Surgical management is recommended for symptomatic patients or those demonstrating progressive neurological deficits. The primary objective is adequate decompression of the spinal cord, achieved through complete cyst excision or fenestration. Complete resection, when technically feasible, is generally associated with lower recurrence rates and favorable neurological outcomes [2, 6]. Ramazanoğlu et al. reported that cyst fenestration may represent an appropriate alternative to cyst resection, particularly in cases without intracystic adhesions or trabeculations. However, they also noted that patients with a history of prior intradural surgery, as well as those with

adhesions or trabeculations, exhibit higher rates of residual cyst and recurrence. They further advised that in the presence of trabeculation, cyst excision is the most appropriate surgical option [6]. In addition, endoscopic techniques and shunting procedures have also been reported as surgical approaches for these cysts [6-8]. Recently, the minimally invasive treatment of spinal arachnoid cysts using catheter placement under ultrasound guidance has also been reported [9]. In our patient, complete excision was performed under intraoperative neuromonitoring, minimizing the risk of neurological injury. Postoperative recovery in this case was notable for rapid symptomatic improvement and sustained benefit at six-month follow-up. The absence of residual cyst on postoperative MRI and the restoration of normal spinal cord anatomy correlate with the favorable clinical outcome. Consistent with prior literature, early surgical intervention before the development of irreversible myelopathic changes likely contributed to the excellent prognosis.

This case underscores several important clinical considerations. First, thoracic intradural arachnoid cysts may present with atypical symptoms resembling lumbar, thıracic or cervical spinal stenosis. Second, the presence of claudication symptoms despite normal lumbar imaging findings should prompt further evaluation of the thoracic spine. Finally, timely surgical decompression can result in significant and durable clinical improvement.

In conclusion, although thoracic intradural extramedullary arachnoid cysts are rare, they should be included in the differential diagnosis of unexplained neurogenic claudication and progressive gait limitation. MRI plays a central role in diagnosis and surgical planning, and complete surgical excision offers excellent outcomes in appropriately selected patients.

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Conflict of Interest

The authors declare no conflict of interest related to this article.

Author Contributions

Dr. Hakan AK: Conceptualization, primary manuscript drafting manuscript review, and editing.

Dr. Sedanur Özgül: Primary manuscript drafting, data collection, data analysis.

Data Availability

Any inquiries regarding supporting data availability of this study should be directed to the corresponding author.

Informed Consent

Written informed consent was obtained from the patient.

Artificial Intelligence Usage Statement

ChatGPT (OpenAI) was used to assist with English language translation and editing. The authors reviewed and approved the final version of the manuscript and take full responsibility for its content.

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