ScieniQ Publishers

Journal of Neurology and Neuroscience Research

Case Report

Giant noncommunicating extradural thoracic arach noid cyst in an adult : A case report and review of the literature

Coulibaly Oumar, Quenum Kouassi Jean Marie Maurin Kisito, Sissoko Daouda, Dama Mahamadou, Togo Amadou, Diarra Kassim, Sogoba Youssouf, Kanikomo Drissa, Diallo Oumar

Department of Neurosurgery, University of Sciences, Technics and Technologies of Bamako (U.S.T.T.B), Bamako (Mali)

***Corresponding author**
Coulibaly Oumar. Department of Neurosurgery, University of Sciences, Technics and Technologies of Bamako (U.S.T.T.B), Bamako (Mali)

Received: 18 November 2025
Accepted: 26 November 2025
Published: 14 December 2025

ABSTRACT

Noncommunicating spinal extradural arachnoid cysts (NSEAC) are extremely rare spinal lesions, mainly found in adults. They are believed to arise from an arachnoid membrane herniation through a small dural defect and are mostly reported to be located at lower thoracic region and thoracolumbar junction. The pathogenesis of this entity is still unclear. Here, we describe a case of a giant noncommunicating extradural thoracic arachnoid cyst in a 52-year-old man revealing by spinal cord compression. Magnetic resonance imaging is the diagnostic modality of choice. Complete surgical excision is mandatory for symptomatic patients and stays the best therapeutic option.

Keywords: Extradural cyst, Arachnoid cyst, Spine, Cord compression

Introduction

Non-communicating Extradural Arachnoid Cysts (NEACs) , a small subset of spinal extradural arachnoid cysts are extremely rare. They account less than 1 % of all spinal space-occupying lesions [1,2]. They are believed to originate from arachnoid membrane herniation through a small dural defect, that progressively enlarged following raised CSF pressure and cause spinal cord compression. Then, increased wall tension might cause back pressure which may contribute to the closure of the communicating pedicle and leading to NEACs [3-5]. They are mostly reported to be located at the thoracic spine followed by thoracolumbar and lumbosacral junctions with respectively 65 % and 25 % [3,6]. They predominantly affect males in the second to fifth decades of life [2,7]. The etiology of SEACs remains unclear and they are widely accepted to be congenital, however, they may also develop secondary to trauma, infections, inflammatory processes, or interventions. Symptoms include from local pain, or intermittent neurogenic claudication to spinal cord compression.

CASE REPORT

A 52-year-old man with no previous medical history, presented within our department for 4 months history of progressive thoracic back pain exacerbated by his daily activities. These symptoms had been complicated by intermittent neurogenic claudication, progressive ascending bilateral numbness with weakness in the lower limbs. However, he signed to have sometimes urgency to urinate a month before his admission in our institution . This last symptom conducted him to do urinary tests that were normal. The sensory level was T10. There was neither history of trauma , infection or previous spinal procedures. Neurological examination showed a well-nourished patient with no deficit and no fever, presented hyperreflexia in deep tendon reflexes with bilateral Babinski sign in both lower limbs. Bladder and bowel functions were normal. Magnetic resonance imaging (MRI) revealed a large extradural cystic lesion , well demarcated from the dura ; extending from T7-T9 and measuring 50,5x21x11,8 mm ; hypointense on T1-weighted images, hyperintense on T2-weighted images, with no gadolinium enhancement. This lesion displaced anteriorly the spinal cord which was flattened by cyst compression (Figure.1). Considering the progression of the clinical symptoms, a surgical exploration was mandatory. On prone position , after general anesthesia and under fluoroscopy, a T7 to T9 laminectomy was made easily and revealed a huge whitening distended cystic mass located dorsally to the dural sac. This cyst was opened sagittally to diminish the pression on the spinal cord. The contents of this cyst were clear reassembling to CSF. The cyst wall was progressively dissected from the dura and completely removed . Per operatively, no dural defects were found adjacent to the nerve roots sleeves and in the dorsal midline. Valsalva maneuver showed no CSF leaking. Histopathological study of excised tissues stained with hematoxylin and eosin showed arachnoid mesothelial cells arranged among fibers of the connective tissue confirming the diagnosis of arachnoid cyst (Figure.2). Low back pain rapidly resolved immediately after surgery, but the power of both lower limbs slightly decreased and was 4/5. He was discharged 6 days after surgery and referred to physiotherapy for rehabilitation. The postoperative course was uneventful and he is free of symptoms for 6 months follow-up.

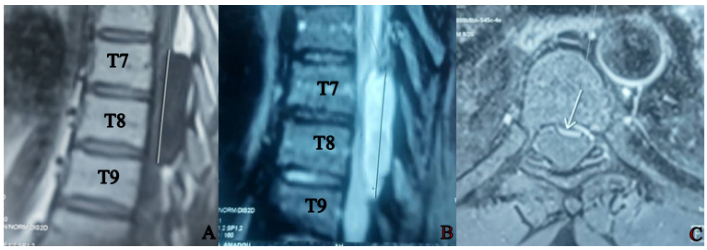

Figure 1. Preoperative MRI showed a spinal extradural arachnoid cyst with posterior spinal cord compression. (A) Sagittal T1-weighted image: hypointense cystic lesion at the thoracic region with no enhancement after gadolinium administration. (B) Sagittal T2-weighted image: Hyperintense cystic lesion at the posterior thoracic region. (C) Axial T1-weighted image showing a posterior spinal cord compressed and displaced anteriorly (white arrow).

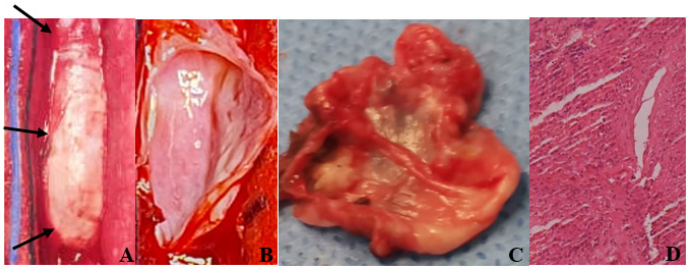

Figure 2. a) Operative view of the huge whitening distended cystic mass located dorsally to the dural sac (black arrow). b, c) Cyst wall dissected from the dura with no dural defect identified and sent for histology and confirming the diagnosis of arachnoid cyst (d).

DISCUSSION

Non-communicating spinal extradural arachnoid cysts are extremely rare and account less than 1% of all spinal tumors [3,4]. They constitute a small subset of SEACs supposed to be responsible of spinal cord compression in some rare cases. They are mostly located in the thoracic spine in 65 % followed by lumbar and lumbosacral regions in 13 % , thoracolumbar in 12% , sacral in 7%, and cervical regions in 3 %. [8-10]. Till 2024, about 23 cases of NEACs had been published in the literature [3,11,12]. The majority of these cases occurred in adults ; from which men are the most affected. The exact cause of these NSEACs and their expansion is not fully understood. Most cases are thought to be congenital, while others may be acquired due to trauma, inflammation, or surgery [4,13-15]. They are believed to arise from a protrusion of the arachnoid membrane through a dural defect which might be closed during progression. The absence of the communicating channel was reported by several authors [4,5,12,16]. Globally, the pathophysiology of SEACs, from its genesis to its enlargement can be explained by 02 main accepted theories : firstly, the active fluid secretion theory by the arachnoid membranes contained within the cyst leading to non-communicating cyst, and secondly passive pulsatile CSF dynamic theory as a one-way valve between the subarachnoid space and the cyst leading to communicating cyst [16,17,18]. According to this first theory, there was no communication between the subarachnoid space and the cyst wall in our case. Similar cases had been reported in the literature [3,4,5,11,12]. The symptoms depend on the location of the cyst within the spine and the severity of spinal cord or root compressions. On thoracic spine, the signs often include back pain, paresthesia, radiculopathy, extremity weakness and less commonly compressive myelopathy with bowel and bladder dysfunction [7,11,13,14]. Magnetic resonance imaging (MRI) is the modality of choice to diagnosis SEACs. SEACs are hypointense in T1 and hyperintense in T2 sequences, so is the CSF. There is no gadolinium enhancement of the cysts. MRI flow studies are ideal to localize the site of cerebrospinal fluid leakage . CT myelography with delayed scanning can be used in some cases where a MRI is contraindicated [9,10]. Surgery is the treatment of choice for symptomatic patients. Conservative treatment with observation and long-term close follow-up is recommended [8,11,19]. Surgical indications are mandatory for pain and neurologic deficits. There is no consensus on the best surgical technique, but we believe that complete resection of the cyst through laminoplasty or laminectomy must be the preferred strategy because it offers the relief of the pressure inside the spinal canal and do not cause spinal instability [19,20]. This is the case in our patient who had 3 levels of laminectomy without instability. Other surgical methods includes shunting procedures, percutaneous image-guided aspiration, and minimally invasive endoscopic approaches are rarely used [11,14,18,21]. Prognosis depends upon age, duration of symptoms, location and extent of spinal cord and/or nerve root compression.

CONCLUSION

Non-communicant Spinal Extradural Arachnoid Cysts (NEACs) are an uncommon cause of spinal cord compression . The clinical signs depend on the location of these cysts within the spinal canal. MRI is the diagnosis tool of choice. Complete surgical excision is mandatory for symptomatic patients.

REFERENCES

1. G.Lombardi,G.Morello. (1963)Congenital cysts of the spinal membranes and roots, Br.J. Radiol. 36: 197–205.
2. Savage AJ. , Asaid M., McLean C., Chan P. (2022) Spinal extradural arachnoid cyst: A rare cause of thoracic myelopathy. eNeurologicalSci. 28: 100415.
3. Khan SI, Ahmed N, Chaurasia B, Ahsan K. (2020) Diagnosis and treatment of noncommunicating extradural spinal thoracolumbar arachnoid cyst. Surg Neurol Int.11: 405.
4. Kim IS, Hong JT, Son BC, Lee SW. (2010) Noncommunicating spinal extradural meningeal cyst in thoracolumbar spine. J Korean Neurosurg Soc. 48: 534-7.
5. Liu JK, Cole CD, Sherr GT, Kestle JR, Walker ML. (2005) Noncommunicating spinal extradural arachnoid cyst causing spinal cord compression in a child. J Neurosurg. 103 Suppl 3: 266-9.
6. Payer M. , Brühlhart K. (2011) Spinal extradural arachnoid cyst: Review of surgical techniques. Journal of Clinical Neuroscience. 18: 559–560.
7. Z. Cai, X. Hong, J. Huang, et al., (2021) Microsurgical treatment of symptomatic spinal extradural arachnoid cyst: a consecutive case series of 34 patients and literature review,Clin. Neurol. Neurosurg. 210: 107000.
8. Hatashita S, Kondo A, Shimizu T, Kurosu A, Ueno H. (2001) Spinal extra- dural arachnoid cyst: case report. Neurol Med Chir (Tokyo). 41: 318-21.
9. Khosla A, Wippold FJ 2nd. CT myelography and MR imaging of extramedullary cysts of the spinal canal in adult and pediatric patients. AJR Am J Roentgenol 2002;178:201-7.
10. DiSclafani A, Canale DJ. (1985) Communicating spinal arachnoid cysts: diagnosis by delayed metrizamide computed tomography. Surg Neurol. 23: 428–30.
11. Mohammad Shahidul Islam Khan, Nazmin Ahmed, Kanak Kanti Barua, Bipin Chaurasia, Atul Vats & Atul Goel (2022): Pathogenesis, management strategies, and outcome of non-communicating extradural spinal arachnoid cyst (NEAC): a systematic review, British Journal of Neurosurgery, DOI: 10.1080/02688697.2022.2090505.
12. Bocco AF., Bertal A., Mawhoub S., Mahazou I., Haouas MY., Ibahioin K., Hilmani S., Lakhdar A. (2020) Noncommunicating Spinal Extradural Arachnoid Cyst in a Child: A Case Report. Annals of Clinical Cases. 1: 1018.
13. H. Funao, M. Nakamura, N. Hosogane, et al., (2012) Surgical treatment of spinal extradural arachnoid cysts in the thoracolumbar spine, Neurosurgery. 71: 278-284 (discussion 284).
14. F. de Oliveira *, F. Leira, L. Braga, P. Zamprogno, A. Aversa, R. Guimara-es, F. Carvalho. (2021) Extradural arachnoid cyst – Case report

and literature review . Interdisciplinary Neurosurgery: Advanced Techniques and Case Management. 23: 100995.
15. Kulkarni AG, Goel A, Thiruppathy SP, Desai K. (2004) Extradural arachnoid cysts: A study of seven cases. Br J Neurosurg. 18: 484-8.
16. Lake PA, Minckler J, Scanlan RL. (1974) Spinal epidural cyst: theories of pathogenesis. Case report. J Neurosurg. 40: 774-8.
17. Suryaningtyas W, Arifin M. (2007) Multiple spinal extradural arachnoid cysts occurring in a child: case report. J Neurosurg. 106: 158-61.
18. Rohrer DC, Burchiel KJ, Gruber DP. (1993) Intraspinal extradural meningeal cyst demonstrating ball-valve mechanism of formation: case report. J Neurosurg. 78: 122-5.
19. Woo JB, Son DW, Kang KT, Lee JS, Song GS, Sung SK, et al. (2016) Spinal extradural arachnoid cyst. Korean J Neurotrauma.12: 185-90.
20. T. Mehmet, O. Erdinc, I. Ahmet. (2015) Spinal extradural arachnoid cysts: a series of 10 cases, J. Neurol. Surg. A. 76: 348-352, https://doi.org/10.1055/s-0035- 1547360.
21. Singh DK, Nayak S, Singh N, Agrahari VK, Chhabra A. (2022) Extradural spinal arachnoid cysts: Management and outcome in five children. J Pediatr Neurosci.17: 119-25.

Cite this article: Coulibaly Oumar, Quenum Kouassi Jean Marie Maurin Kisito,Sissoko Daouda,Dama Mahamadou, Togo Amadou, Diarra Kassim, Sogoba Youssouf,Kanikomo Drissa, Diallo Oumar. (2025) Giant noncommunicating extradural thoracic arachnoid cyst in an adult : A case report and review of the literature. Journal of Neurology and Neuroscience Research 6(2): 191-193.