

Surgical Management of a Neuroenteric Cyst at T12-L1 Levels: A Case Report and Review of Literature

Khadija Elguettabi¹, Zaari Nahla¹, Saad Hmada¹, Amine El Khamouye^{1,2,*},
Nassima Daite¹, Abderrazak Bertal², Khadija Ibahiouin², Said Hilmani²,
Abdessamad Naja², and Abdelhakim Lakhdar²

ABSTRACT

Neuroenteric cysts are rare spinal cord lesions that present diverse neurological symptoms. The optimal surgical management of these lesions remains controversial due to limited available data on long-term outcomes. Here, we present the case of a 32-year-old male patient with sphincter disorder, diagnosed with a cystic extramedullary intradural lesion at T12-L1 levels. The patient underwent a successful laminectomy and total microsurgical excision of the cyst through a posterior approach. Histopathological analysis confirmed a neuroenteric cyst and postoperative follow-up demonstrated regression of the sphincter disorder without recurrence. This case highlights the significance of early diagnosis, complete surgical excision, and histological analysis for favorable clinical outcomes in patients with neuroenteric cysts. We also discuss the risks and benefits of different surgical approaches, focusing on the posterior approach utilized in this case. Additionally, we review the existing literature on neuroenteric cyst management and address the limitations of current data. Further research is warranted to refine the optimal surgical management of neuroenteric cysts and enhance patient outcomes. Our case emphasizes the need to consider neuroenteric cysts in the differential diagnosis of patients with neurological symptoms and advocate for a multidisciplinary approach to their management.

Submitted: May 26, 2024

Published: September 15, 2024

 10.24018/lejmed.2024.6.5.2138

¹Department of Neurosurgery, Chu Ibn Rochd Casablanca, Morocco.

²Department of Neurosurgery, Chu Ibn Rochd Casablanca; Laboratory for Research into Diseases of the Nervous and Neurosensory Systems and Disability, Faculty of Medicine and Pharmacy, Hassan II University Casablanca, Morocco.

*Corresponding Author:
e-mail: elkhamouyeamine@gmail.com

Keywords: Neuroenteric cyst, posterior approach, spinal cord lesion, surgical management.

1. INTRODUCTION

Neuroenteric cysts are rare spinal cord lesions that can present with a wide spectrum of neurological symptoms [1]. The optimal surgical management of these lesions remains a subject of debate, primarily due to the scarcity of data concerning long-term outcomes [2]. Here, we present a case of a neuroenteric cyst at T12-L1 levels, emphasizing the importance of early diagnosis, complete surgical excision, and histological analysis in achieving favorable clinical outcomes. We also discuss the risks and benefits of different surgical approaches and review the existing literature on the management of neuroenteric cysts.

2. BACKGROUND

Neuroenteric cysts are rare spinal cord lesions characterized by cystic extramedullary intradural lesions that can cause a variety of neurological symptoms [3]. These cysts are believed to arise from developmental anomalies in the embryonic neuroenteric canal, which connects the developing neural tube to the yolk sac during early gestation [4], [5]. Neuroenteric cysts can occur along the entire length of the spinal cord, with the thoracic region being the most common site of involvement [6].

The true incidence of neuroenteric cysts is difficult to determine due to their rarity and often asymptomatic nature. However, they are estimated to represent less than 1% of all spinal cord tumors and cysts. Neuroenteric

cysts can present at any age, but they are most frequently diagnosed in young adults, with a slight male predominance [7].

Clinical presentation of neuroenteric cysts can vary depending on the size, location, and involvement of adjacent neural structures. Patients may present with back pain, radiculopathy, myelopathy, or a combination of these symptoms. Neurological deficits can range from mild sensory disturbances to severe motor deficits or even acute spinal cord compression. In some cases, neuroenteric cysts may remain asymptomatic and incidentally detected in imaging studies [8].

Diagnostic imaging plays a crucial role in the evaluation of neuroenteric cysts. Magnetic resonance imaging (MRI) is the preferred modality for visualizing these lesions. On MRI, neuroenteric cysts typically appear as well-defined, fluid-filled cystic lesions with CSF-like signal intensity [9]. The cysts may exhibit variable enhancement patterns depending on the presence of hemorrhage, infection, or papillary projections within the cystic cavity. Differential diagnoses include other cystic spinal lesions such as arachnoid cysts, intradural extramedullary tumors, or syringomyelia [6].

The management of neuroenteric cysts is primarily surgical, aiming for complete resection to prevent recurrence and alleviate neurological symptoms. However, the optimal surgical approach and extent of resection remain areas of debate [1]. Different surgical techniques have been described in the literature, including posterior laminectomy, anterior or anterolateral approaches, and combined approaches. The choice of approach depends on factors such as the cyst's location, size, and relationship with adjacent structures [10]. Preservation of neural tissue and prevention of complications, such as cerebrospinal fluid (CSF) leakage and neurological deficits, are key considerations.

3. CLINICAL CASE

A 32-year-old male patient presented with sphincter disorder, prompting further investigation. Imaging studies revealed a cystic extramedullary intradural lesion at the T12-L1 levels. The patient underwent laminectomy with total microsurgical excision of the cyst utilizing a posterior approach (see Fig. 2). Histopathological examination confirmed a neuroenteric cyst. Postoperatively, the patient experienced a regression of the sphincter disorder, and follow-up imaging showed no signs of recurrence (see Fig. 1).

4. DISCUSSION

Neuroenteric cysts are rare spinal cord lesions that can cause a variety of neurological symptoms [6]. Due to their rarity, the optimal surgical management of these lesions remains a topic of debate, and there is limited data available on long-term outcomes [11]. In this manuscript, we present a case of a 32-year-old male patient with a neuroenteric cyst at T12-L1 levels and discuss the importance of early diagnosis, complete surgical excision, and histological analysis in achieving good clinical outcomes.

Our case highlights the significance of early diagnosis in the management of neuroenteric cysts [12]. The patient was initially presented with sphincter disorder, which prompted further investigation. Imaging studies revealed a cystic extramedullary intradural lesion at T12-L1 levels. Prompt identification and evaluation of the lesion allowed for timely intervention, which is crucial for minimizing neurological deficits and improving patient outcomes.

Surgical excision is considered the mainstay of treatment for neuroenteric cysts [12]. In our case, the patient underwent laminectomy with a total microsurgical excision of the cyst through a posterior approach. This approach provided adequate exposure and allowed for complete removal of the cyst. Successful surgical excision resulted in the regression of the sphincter disorder and demonstrated the effectiveness of the selected surgical technique.

Histological analysis of the excised specimen confirmed a neuroenteric cyst. Histopathological examination is essential for accurate diagnosis and classification of these lesions. Neuroenteric cysts are lined by gastrointestinal epithelium, which helps differentiate them from other intradural cystic lesions. Obtaining a definitive histopathological diagnosis is crucial for appropriate management and to rule out other pathologies that may present similarly [12].

The favorable clinical outcome observed in our case supports the importance of complete surgical excision for neuroenteric cysts. Studies have shown that incomplete resection or partial excision can lead to recurrence and persistent symptoms. Achieving total removal of the cyst is challenging due to the anatomical complexity of the spinal cord and the potential for adhesions. However, complete excision should be attempted whenever feasible to minimize the risk of recurrence and neurological deficits [10].

The surgical approach for neuroenteric cysts remains a subject of debate. In our case, a posterior approach was utilized, which allowed for successful cyst removal and symptom resolution. The posterior approach offers direct access to the cyst, providing better visualization and the ability to dissect and remove the lesion meticulously. However, other surgical approaches, such as anterior or combined approaches, have also been described in the literature. The choice of approach depends on several factors, including cyst location, size, and the surgeon's experience and preference. Each approach has its advantages and potential complications, and the selection should be tailored to the individual patient's characteristics and the surgeon's expertise [11].

The current literature on the management of neuroenteric cysts is limited, primarily consisting of case reports and small case series. There is a lack of large-scale studies with long-term follow-up data. Therefore, the optimal surgical management and long-term outcomes of neuroenteric cysts remain uncertain. Further research is needed to better understand the natural history of these lesions, refine surgical techniques, evaluate the effectiveness of different approaches, and assess long-term outcomes. Collaboration between multiple centers and the establishment of registries or databases dedicated to spinal cord lesions

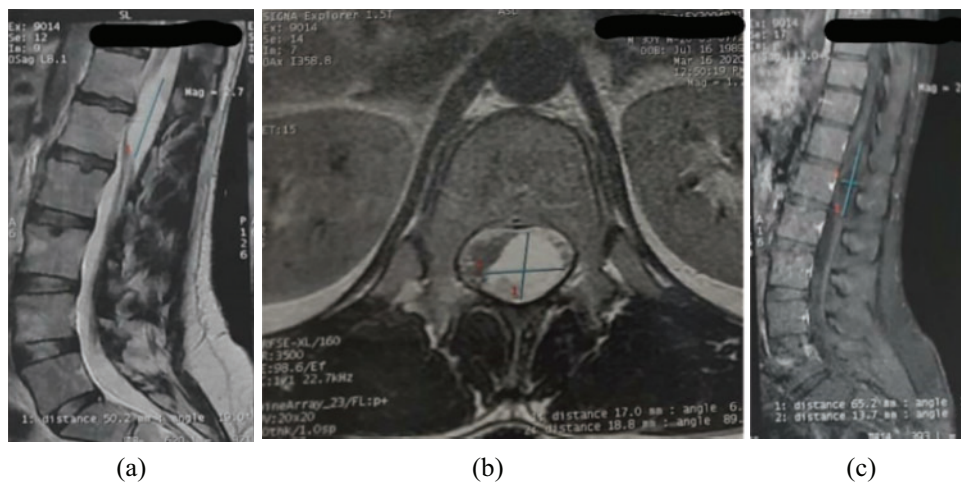


Fig. 1. (a) Sagittal T2, (b) axial T2, (c) sagittal T1 with gadolinium: Dorso-lumbar MRI showing the lesion without any contrast enhancement in T1 and hyper-intense in T2.



Fig. 2. Post-operative picture of the cyst wall, which was extradural and fully extracted.

could facilitate data collection and provide more comprehensive insights into the management of neuroenteric cysts.

Although our case demonstrates a successful outcome, there are limitations to consider. This study represents a single case report, and the results may not be generalizable to all patients with neuroenteric cysts. The rarity of the condition and the limited number of cases make it challenging to draw definitive conclusions. Additionally, the absence of long-term follow-up data prevents us from assessing the durability of the surgical outcome.

5. CONCLUSION

This case report illustrates the successful surgical management of a neuroenteric cyst at the T12-L1 levels through total microsurgical excision using a posterior

approach. Early diagnosis, complete surgical excision, and histopathological analysis remain essential for achieving favorable clinical outcomes in patients with this rare spinal cord lesion. Our findings emphasize the importance of considering neuroenteric cysts in the differential diagnosis of patients presenting with neurological symptoms and advocate for a multidisciplinary approach to their management. Further research is necessary to enhance our understanding of the optimal surgical techniques for neuroenteric cysts and to improve patient outcomes.

ACKNOWLEDGMENT

We would like to express our gratitude to the patient who participated in this study. We also thank the health-care professionals involved in the patient's care. Their collaboration and expertise were invaluable in the successful management of this case.

ETHICAL APPROVAL

Ethical approval was obtained from the Institutional Review Board (IRB) of Ibn Rochd University Center, Casablanca, prior to conducting this study. Written informed consent was obtained from the patient for the publication of this case report and any accompanying images.

INFORMED CONSENT

Written informed consent was obtained from the patient for the publication of this case report and any accompanying images.

CONFLICT OF INTEREST

The authors declare that they do not have any conflict of interest.

REFERENCES

- [1] Song JK, Burkey BB, Konrad PE. Lateral approach to a neuroenteric cyst of the cervical spine: case presentation and review of surgical technique. *Spine*. 2003 Feb 15;28(4):E81–5. doi: 10.1097/01.BRS.0000049225.46912.BA.
- [2] Ricciardelli A, Tantry EK, Flores A, McGinnis J, Bauer DF. Treatment of ventral neuroenteric cyst at the cervicothoracic junction with the anterior approach in a pediatric patient: illustrative case. *J Neurosurg Case Lessons*. 2024;8(7):1–8. doi: 10.3171/CASE24120.
- [3] Savage JJ, Casey JN, McNeill IT, Sherman JH. Neuroenteric cysts of the spine. *J Craniovertebr Jct Spine*. 2010;1(1):58–63. doi: 10.4103/0974-8237.65484.
- [4] Shukla M, Behari S, Das KK, Mehrotra A, Srivastava AK, Sahu RN, et al. Spinal neuroenteric cysts: associated developmental anomalies and rationale of surgical approaches. *Acta Neurochir (Wien)*. 2015;157(9):1601–10.
- [5] Brooks BS, Duvall ER, el Gammal T, Garcia JH, Gupta KL, Kapila A. Neuroimaging features of neuroenteric cysts: analysis of nine cases and review of the literature. *AJNR Am J Neuroradiol*. 1993;14(3):735–46.
- [6] Kozak J, Bizik I, Surkala J, Steno J, Steno A. Neuroenteric cysts, incidence and surgical treatment. *Clin Study*. 2019;120(9):680–5.
- [7] Baek WK, Lachkar S, Iwanaga J, Oskouian RJ, Loukas M, Oakes WJ, et al. Comprehensive review of spinal neuroenteric cysts with a focus on histopathological findings. *Cureus*. 2018;10(9):1–5.
- [8] Khosla A, Wippold FJ. CT myelography and MR imaging of extramedullary cysts of the spinal canal in adult and pediatric patients. *AJR Am J Roentgenol*. 2002;178(1):201–7.
- [9] Fernandes ET, Custer MD, Burton EM, Bouliden TF, Wrenn EL Jr, Whittle AP, et al. Neuroenteric cyst: surgery and diagnostic imaging. *J Pediatr Surg*. 1991;26(1):108–10.
- [10] Preece MT, Osborn AG, Chin SS, Smirniotopoulos JG. Intracranial neuroenteric cysts: imaging and pathology spectrum. *AJNR Am J Neuroradiol*. 2006;27(6):1211–6.
- [11] Barges-Coll J, Fernandez-Miranda JC, Prevedello DM, Gardner P, Morera V, Madhok R, et al. Avoiding injury to the abducens nerve during expanded endonasal endoscopic surgery: anatomic and clinical case studies. *Neurosurgery*. 2010;67(1):144–54.
- [12] Chiang LJ, Wang CK, Tsai HW, Lee JS. Diagnostic dilemma in discriminating between spinal neuroenteric cysts and simple arachnoid cysts based on embryogenesis and surgical correlation. *World Neurosurg*. 2020;134:489–94.