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Editor
Nancy E. Epstein, MD
Clinical Professor of Neurological Surgery, School of Medicine, State U. of NY at Stony Brook

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Case Report

Multiple extradural spinal arachnoid cysts: A case report

Joaquim Francisco Cavalcante-Neto[1], Lúcio Soares e Silva-Neto[1], Paulo Roberto Lacerda Leal[2], Cláudio Henrique Souza Moreira[2], Espártaco Moraes Lima Ribeiro[1], Gerardo Cristino-Filho[2], Keven Ferreira da Ponte[2]

[1]Department of Neurosurgery, Federal University of Ceará, [2]Department of Neurosurgery, North Regional Hospital, Sobral, Ceará, Brazil.

E-mail: *Joaquim Francisco Cavalcante-Neto - joaquimfcn@hotmail.com; Lúcio Soares e Silva-Neto - luciosoaresneto@hotmail.com; Paulo Roberto Lacerda Leal - prlleal@hotmail.com; Cláudio Henrique Souza Moreira - chsm5643@gmail.com; Espártaco Moraes Lima Ribeiro - espartacoribeiro@gmail.com; Gerardo Cristino-Filho - gcristinofilho@gmail.com; Keven Ferreira da Ponte - kevenponte@gmail.com

***Corresponding author:**
Joaquim Francisco Cavalcante-Neto,
Department of Neurosurgery,
Federal University of Ceará,
Sobral, Ceará, Brazil.

joaquimfcn@hotmail.com

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ABSTRACT

Background: Extradural spinal arachnoid cysts (SACs) rarely cause neural compression and disability.

Case Description: A 38-year-old female presented with a history of two episodes of falling due to transient weakness in the lower limbs. The neurological examination showed normal motor and sensory function, but hyperreflexia. The thoracic magnetic resonance imaging revealed multiple extradural SACs between the T3-L1 levels. Following complete surgical resection of the most symptomatic cyst, she did well. The histopathological examination confirmed a Type I extradural SAC.

Conclusion: Here, we discussed one case and reviewed the literature on the diagnosis and treatment of multiple extradural SACs.

Keywords: Extradural cyst, Extradural spinal arachnoid cyst, Spinal cord, Spinal meningeal cyst

INTRODUCTION

Arachnoid cysts are lesions characterized as collections of cerebrospinal fluid (CSF) lined by arachnoid-like cells (i.e., a diverticulum from a CSF leak). They rarely occur in the spinal region. Although they originate from the arachnoid, these cysts most often occupy the extradural compartment.

There are only 31 cases of multiple extradural spinal arachnoid cysts (SACs) in the literature; of these, only 7 were treated with a partial removal. Here, we present a case of multiple extradural SACs occurring in an adult and discuss the diagnosis (i.e., presentation with spinal cord/root compression) and treatment of these lesions.

CASE PRESENTATION

A 38-year-old female presented with chronic middle back pain, since 2016. She also reported two episodes of transient weakness in the lower extremities accompanied by falls within the last year. Her neurological examination revealed bilateral patellar hyperreflexia, but there was no evidence of any motor or sensory deficits.

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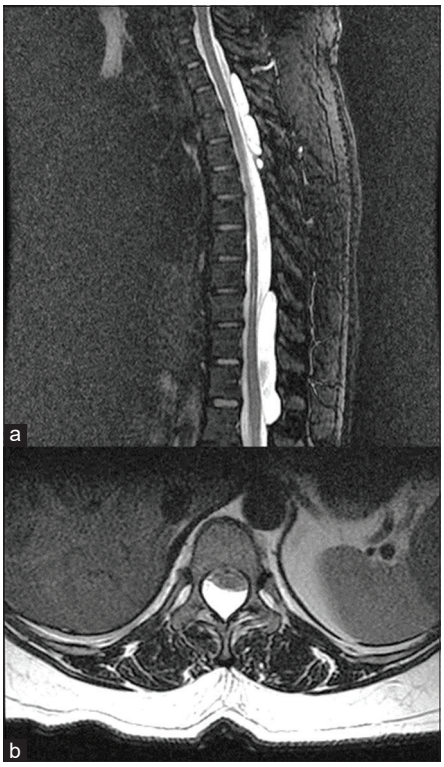

Figure 1: Preoperative imaging. (a) Mid-sagittal T2WI with fat suppression magnetic resonance imaging (MRI) demonstrating multiple (4) extradural spinal arachnoid cysts at T3-T5 and T10-L1 levels. (b) Axial T2 MRI demonstrating the surgically approached cyst at the T11 level, with spinal cord compression.

Magnetic resonance imaging (MRI) examinations of the entire spine revealed multiple cystic-appearing lesions dorsal to the spinal cord at the T3-T5 and T10-L1 levels [Figure 1]. They were rounded and were of the same signal intensity as CSF, although separated from the CSF space by a hypointense plane contiguous with the dura. These findings were compatible with the diagnosis of extradural arachnoid cysts. The cyst at the T10-L1 level was significantly larger and caused compression of the underlying spinal cord.

Surgery

The patient underwent a laminectomy at the T10/11 level for a complete cyst resection [Figure 2]. The point of communication with the CSF space through the dura was identified laterally and closed by suture ligation.

Histopathology

The histopathological examination confirmed the diagnosis of an arachnoid cyst (Type I extradural SAC). It described the presence of a fibrous wall and absence of neoplasia or dysplasia signs. The cyst measured 3.2 × 2.1 × 0.4 cm.

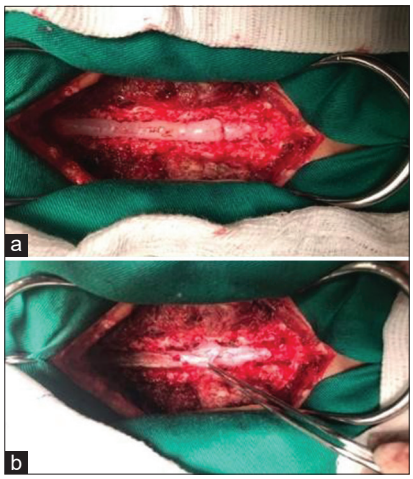

Figure 2: Intraoperative images. (a) View of the extradural cyst after T10-L1 laminectomy. (b) View of the point of communication with the cerebrospinal fluid space through the dura laterally, at the T11 level.

Postoperative course

After a 3-month follow-up, the back pain significantly improved and the neurological exam normalized. As the partial removal was successful, the patient warranted and continues to require clinical and radiological follow-up for the cephalad untreated cysts.

DISCUSSION AND LITERATURE REVIEW

The most common site of SACs is the posterior aspect of the spinal cord (80%) and the thoracic region (70%), possibly because of the thoracic cord length and its narrower spinal canal.[7] They affect mostly male patients in their second decade of life.[2]

Their pathogenesis remains unclear and there are various theories: a diverticulum or congenital dural malformation with arachnoid herniation, the genesis of a septum posticum diverticulum, or a collection of arachnoid granulations with CSF production.[6] They are created due to a ball valve mechanism, that is, a communication between the cyst and subarachnoid space which acts as a one-way valve.

Nabors *et al*.[7] classified the SAC lesions as: Type I (extradural without nerve root fibers), Type II (extradural with nerve root fibers – Tarlov perineural cysts), and Type III (intradural). Extradural SACs, defined as Type I, are the most prevalent.

Multiple SACs

Multiple (>1) extradural SACs are even less frequently encountered expansile spinal cord lesions with only 31 cases found in the literature and rarely contribute to spinal cord or nerve root compression. There is a female preponderance (57%). Cloward[3] reviewed 92 congenital spinal extradural cyst case reports, in which only 6 had a multiple cyst presentation.

The clinical manifestations can include pain, gait ataxia, paresthesia, urinary and/or intestinal incontinence, and spastic/flaccid paralysis. Doita *et al.*[4] demonstrated intermittent compression symptoms resulting from subarachnoid space and cyst pressure changes due to Valsalva maneuver in a kinematic MRI-based study.

Diagnostic studies

MRI

MRI is the most recommended exam for a location-based classification. T1- and T2-weighted sagittal sequences are analyzed mainly, and in both, the CSF is as isointense as the arachnoid cyst. Gradient echo and short-tau inversion recovery, MRI sequence parameters, allow artifact reduction and a distinction between spinal cyst and adipose tissue, respectively.[8] Furthermore, kinematic MRI permits CSF flow visualization, providing a view of the dural defect; important for the surgical procedure and its results.

Computerized tomography (CT)/myelo-CT

CT is a low yield examination because of poor visualization of the spinal cord, but the CT myelogram is efficient at verifying dural leaks or the mass effect from the cyst.[8]

Surgery

Surgery consisting of a posterior approach by laminectomy or laminoplasty with *en bloc* cyst excision is the treatment of choice. It is recommended in case of cyst expansion, bony/neural compression, and/or evolution of a cauda equina syndrome. Partial surgical resection of the most symptomatic lesions appears to be a good therapeutic option.[9] Meticulous repair of the dural defect should be attempted to avoid extradural SAC recurrence.[4] Other authors defend the complete excision of the cyst or an *en bloc* approach to prevent cyst reappearance, with retreatment using a cystoperitoneal shunt, should it recur.[1,5]

CONCLUSION

Although rare, it is important to be aware of and understand the possible presentation of multiple extradural SACs.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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