



Case Report

# Iatrogenic lumbar giant pseudomeningocele: A report of two cases

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## ABSTRACT

**Background:** Iatrogenic lumbar pseudomeningoceles are an uncommon complication of lumbar spinal surgeries. This pathology is an extradural, encapsulated, and cerebrospinal fluid collection which develops as a consequence of an inadvertent, unrepaired dural tear. If a pseudomeningocele grows beyond 8 cm in length, it may be classified as “giant.”

**Case Description:** Two adult females with giant pseudomeningoceles due to remote lumbar laminectomy were presented. Both patients were surgically managed.

**Conclusion:** Iatrogenic lumbar giant pseudomeningocele is rare. Notably, their surgical management is similar to that utilized to treat routine pseudomeningoceles.

**Keywords:** Complication, Dural tear, Giant pseudocyst, Iatrogenic pseudomeningocele, Incidental durotomy, Lumbar discectomy, Lumbar laminectomy

## INTRODUCTION

Iatrogenic pseudomeningocele following spinal surgery is defined as an extradural cystic collection of cerebrospinal fluid (CSF) without a dural covering that results from a breach in the dural-arachnoid layer.<sup>[2,3,5,7,8]</sup> This complication mostly occurs in the lumbar followed by the cervical and thoracic spine.<sup>[4-6]</sup> In the lumbar region, it is mostly seen following laminectomy for a disc herniation or stenosis.

### Size of pseudomeningoceles

Most lumbar pseudomeningoceles are below 5 cm in size, but rarely, they may become “giant” when over 8 cm.<sup>[2,3,8]</sup> Hyndman and Gerber, in 1946, reported the first case of an iatrogenic lumbar pseudomeningocele; since then, there have been 63 additional cases. However, only five giant pseudomeningocele subtypes have been cited. Here, add two additional cases of such giant iatrogenic pseudomeningoceles.<sup>[2,8]</sup>

## CASE DESCRIPTION

### Case 1

A 30-year-old female had a lumbar laminectomy for a left-sided L5-S1 disc herniation. One year later, she developed recurrent lumbar complaints thought to be due to a recurrent disc

herniation. However, the preoperative magnetic resonance imaging (MRI) showed a large/giant pseudomeningocele that extended from L4 to S2 (e.g., total length of 8.9 cm) [Figure 1]. At surgery, the pseudomeningocele sac had an abnormally thick wall that was widely opened [Figure 2a]. After CSF was drained, a protruding rootlet at the depth of the cavity was dissected and maneuvered back into the thecal sac, following by closure of the dural defect [Figure 2b and c]. The patient's complaints fully resolved within 1 month, and the MR performed 5 months later demonstrated full resolution of the pseudomeningocele [Figure 3].

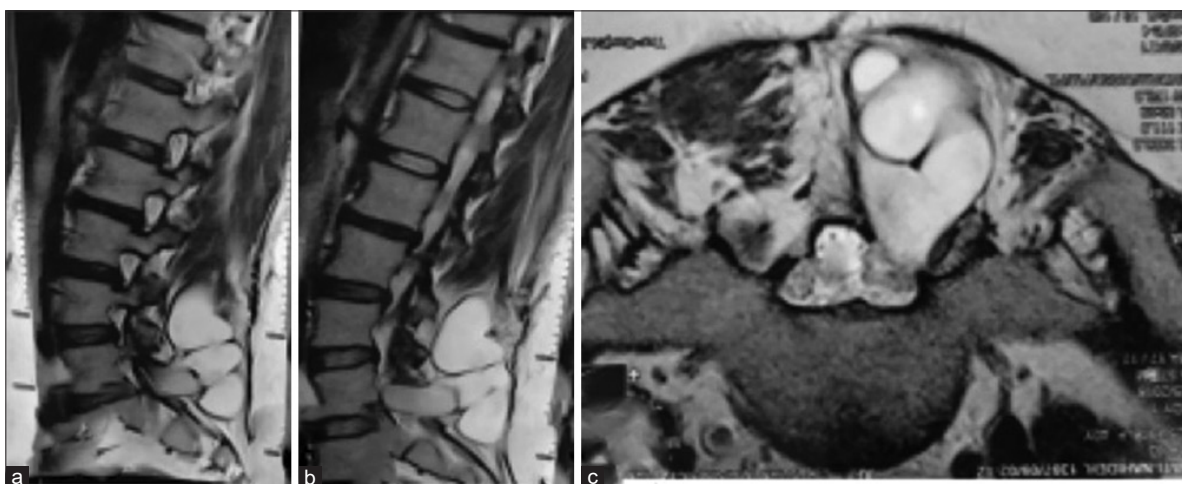
## Case 2

A 51-year-old female originally had a multilevel laminectomy for lumbar stenosis. Eighteen months later, she presented with a history of 3 months of intractable lower back pain and right L4. The lumbar MRI showed a giant pseudomeningocele extending from L2 to L5; it was 12 cm in length, arising from a defect at the L3-L4 level [Figure 4]. At surgery, the giant sac was opened [Figure 5]. At the depth of the sac, two nerve roots were protruding through a dural defect. The rootlets

were replaced within the thecal sac, and the defect was appropriately closed. Postoperatively, the symptoms/signs fully resolved.

## DISCUSSION

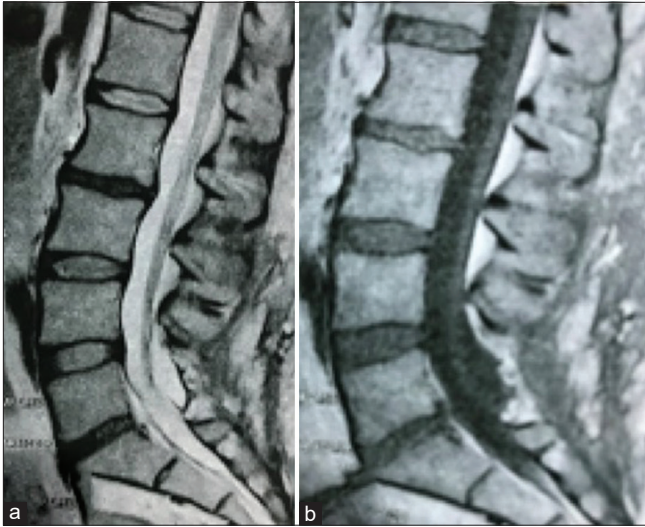
Unnoticed dural tears with an intact arachnoid which possess a ball valve mechanism will result in the development of a true cyst lined with arachnoid tissue; this iatrogenic cyst is a "true meningocele."<sup>[2,3,5,7,8]</sup> The surrounding connective tissue often reinforces the arachnoid capsule overtime. Such unrepaired small dural tears with an arachnoid breach may result in one-way CSF flow, often leading to the formation of a fibrous capsule and pseudomeningocele.<sup>[2,3,5,7,8]</sup> These pseudomeningoceles, occurring at the site of an untreated dural tear, are rare (e.g., incidence from 0.07% to 2%).<sup>[3]</sup> A few months to a few years after a laminectomy with a dural breach, such pseudomeningocele may become symptomatic and reach considerable size. Symptomatically, patients may complain of low back pain (LBP) aggravated with straining and/or Valsalva maneuvers.<sup>[2,3,5,7,8]</sup> In addition, if a rootlet is extruded through the breach and trapped, patients may



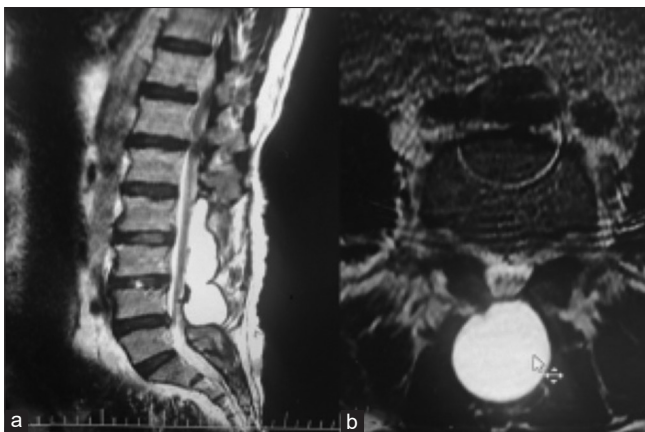
**Figure 1:** T2-weighted magnetic resonance imaging, (a and b) sagittal image showing a high-intensity cyst extending from L4 to S2, (c) axial view demonstrates that the cyst is multilobulated.



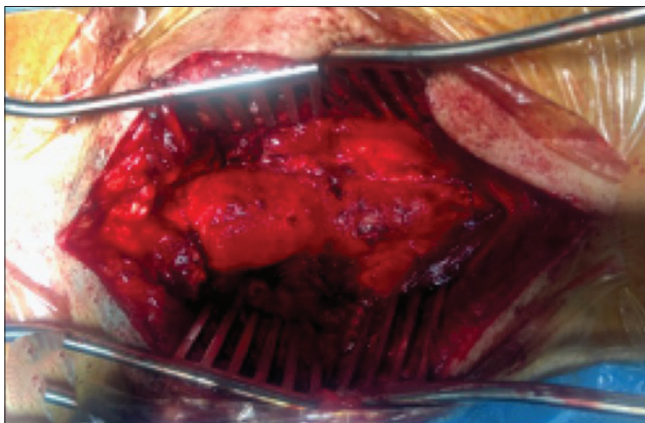
**Figure 2:** Intraoperative photographs, (a) a large pseudomeningocele measuring 8.8 in length, (b) the large defect, (c) tight closure of the defect.



**Figure 3:** Postoperative lumbar magnetic resonance imaging (MRI) showing the success of surgery: MRI, (a) T2-weighted, (b) T1-weighted sagittal image.



**Figure 4:** Lumbar T2-weighted magnetic resonance imaging, (a) sagittal image shows the cyst extending from L1 to L5, note laminectomy of L4, L3, and L2 (b) axial image.



**Figure 5:** Intraoperative photograph, note the giant pseudomeningocele, measuring 9.3 cm in length.

present with quite similar to that seen with recurrent lumbar disc herniations.<sup>[5]</sup>

### Imaging

In plain radiographs, erosion of the surrounding bones might be seen for long-standing cases. Rarely, the wall of the cyst may undergo ossification.<sup>[1]</sup> MRI remains the study of choice for the demonstrating such giant pseudomeningoceles; they reveal a low intensity on T1- and a high signal intensity on T2-weighted MR images. In general, the CSF-containing mass is located posterior to the dural sac although it might rarely grow into the intervertebral disc space.<sup>[5]</sup>

### Management

For asymptomatic cases, one may wait for spontaneous resolution of the pseudomeningoceles; this may occur within 3 months to a few years following the diagnosis.<sup>[7]</sup> Solomon *et al.* noted that healing of the dural defect with the gradual resorption of the CSF may occur, thus resulting in spontaneous resolution of these collections.<sup>[7]</sup> Alternatively, surgery for symptomatic lumbar pseudomeningoceles may require broad opening of the “cyst” and careful closure of the dural breach with delivery of entrapped nerve roots back into the spinal canal/dural sac.<sup>[2,3,5,7,8]</sup>

### CONCLUSION

Incidental dural tears with CSF leakage during lumbar laminectomy should be properly addressed, as if ignored or not found, they may result in the formation of a pseudomeningocele. Lumbar pseudomeningoceles may become symptomatic years later (e.g., LBP/radiculopathy) and warrant appropriate lumbar surgical intervention consisting of localization of the nerve roots extruding from the dural sac, delivery of the roots intradurally, and closure of the dural defect.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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