

## Conus Medullaris Arachnoid Cyst Presenting as Cauda Equina Syndrome

### Abstract

Intradural arachnoid cysts are a rare cause of spinal cord and nerve root compression. Primarily, they are present in the thoracic region posteriorly. We report a 25-year-old man who had an intradural arachnoid cyst at the level of conus medullaris presenting with cauda equina syndrome, which is very rare.

**Keywords:** Arachnoid, cauda equina syndrome, conus medullaris, cysts, intradural

### Introduction

Arachnoid cysts are benign cerebrospinal fluid-filled sacs.<sup>[1]</sup> Pathologically, cyst walls are formed from splitting of the arachnoid membrane, with an inner and outer leaflet surrounding the cystic cavity.<sup>[2]</sup> Spinal intradural arachnoid cysts can be asymptomatic. Neuropathic pain, gait disturbances, paresthesias, paraparesis, or quadriparesis, are the usual presentations. We report a rare intradural arachnoid cyst, at the level of conus medullaris that presented as cauda equina syndrome.

### Case Report

A 25-year-old male presented with bowel incontinence and difficulty in micturition for 4 days. He also had a history of low back pain for 4 years with radiation to the left leg till toes. For past 15 days, he complained of the right leg pain along with numbness. On neurological examination, his power of both extremities, proximal, and distal was found to be 5/5 on Medical Research Council scale. The deep tendon reflexes on the affected side were reported to be normal. However, they were found to be brisk on the left side. His straight-leg raise test was found to be 30° on the right side. He had absent anal reflex and decreased perianal sensation, typical of saddle anesthesia.

The patient had an arachnoid cyst reported at the level of conus medullaris on a magnetic resonance imaging (MRI) 4 years ago when he had lower back pain with leg radiation. His pain settled with medications

and the patient was symptom-free since then. A repeat MRI of Dorsolumbar Spine was done, which showed an increase in the size of the cyst. He underwent laminectomy for excision of an arachnoid cyst, at the level of L1 and L2.

MRI images obtained through lumbosacral spine were acquired both with and without intravenous contrast. The conus medullaris had asymmetry at the level of L1/L2, and filum terminale was deviated anteriorly and superiorly with arching of the nerves. There was an increase in angulation compared to the previous scan, as the size had increased [Figure 1 a-c].

He underwent an L2–L3 laminectomy and after dural opening had near total excision of the arachnoid cyst under microscope. At surgery, the cyst appeared to be filled with clear fluid, delineated on outer and inner aspect by a delicate transparent membrane [Figure 2a and b]. On microscopic examination, a cystic lesion of delicate fibrovascular tissue lined by cuboidal to low columnar meningotheelial lining was found [Figure 3].

The patient's pain settled, and he regained sphincter control immediately after surgery. However, slight numbness persisted in the right leg. He was discharged after 3 days, and a follow-up MRI scan showed resolution of cyst with decompressed conus.

### Discussion

Spinal arachnoid cysts are a rare cause of spinal cord and nerve root compression. Arachnoid cysts have been defined as space

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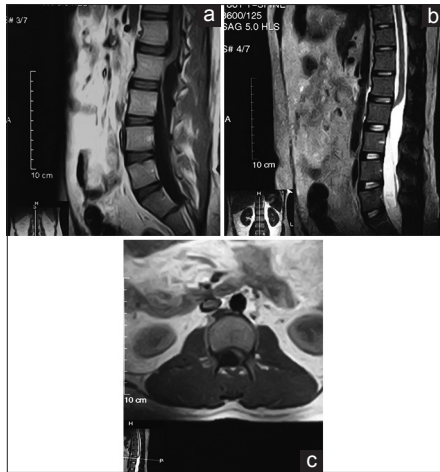
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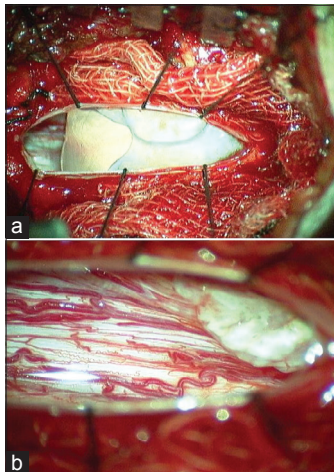
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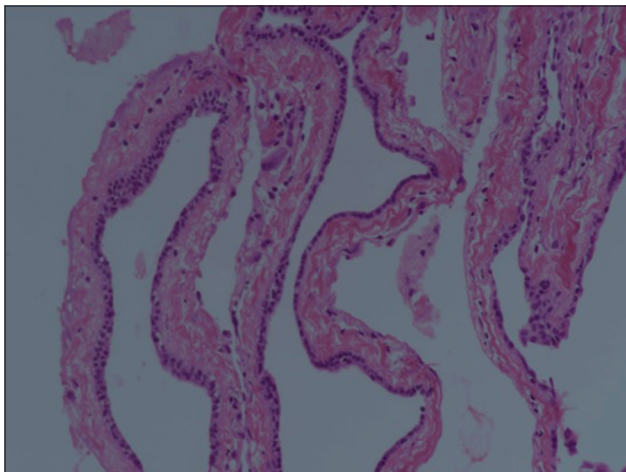




**Figure 1:** (a) Sagittal T1 magnetic resonance imaging showing angulation of the conus with hypointense arachnoid cyst pushing it superiorly and anteriorly. (b) T2-weighted magnetic resonance imaging showing the same. (c) T1-weighted axial magnetic resonance imaging showing the hypointense arachnoid cyst pushing the conus anteriorly and to left



**Figure 2:** (a) Pearly white cyst wall rolled up after laminectomy and dural opening. (b) Neural elements seen decompressed after cyst is removed



**Figure 3:** Delicate fibrovascular tissue lined by cuboidal to low columnar meningotheial lining

occupying lesions containing fluid similar to cerebrospinal fluid. Nabors *et al.* classified the spinal meningeal cysts into extradural meningeal cysts and intradural meningeal cysts.<sup>[3,4]</sup>

These intradural spinal cysts are rare and hardly become symptomatic. They usually present in the mid to lower dorsal thoracic canal.

Symptoms usually occur as a result of spinal cord or spinal nerve root compression. Patients often present with neuropathic pain, paraparesis, paresthesia, gait instability, and occasionally with sphincter dysfunction.<sup>[5]</sup> Our patient falls in the category of occasional rarities. He had paresthesia in the right lower limb, loss of sphincter control, and saddle anesthesia, features synonymous with cauda equina syndrome.

Conus medullaris and cauda equina syndromes are actually two separate entities with minute differences in their presentation. The lesions present in the lumbosacral spine may have overlapping features because of proximity to one another. Conus medullaris syndrome manifests as sensory alterations of the perineum in a saddle distribution and sphincter dysfunction. Patients may present with midline back pain that rarely radiates. Lesions truly isolated to the conus medullaris spare lower extremities. If the lesion is large enough to include some lumbar cord segments, symptoms extend into the lower extremities. If the lumbar cord is affected, the lesions have the characteristics of upper motor neuron lesions with hyperreflexia and symmetric bilateral motor weakness.<sup>[6]</sup>

On the other hand, cauda equina syndrome results from the compression of lumbosacral nerve roots as they exit at the level of conus medullaris, presenting as a lower motor neuron lesion. It usually manifests as a gradual onset, severe, unilateral radicular pain in the lower extremity. Numbness being more localized to the saddle region and loss of sensation and paresthesia could be experienced in specific dermatomes of the lower extremity. Our patient had complained of numbness only in the right thigh.<sup>[7]</sup>

Genitourinary (GU) dysfunction is present in both groups of people, with either conus medullaris lesions or cauda equina lesions. Because the conus medullaris includes most of the sacral cord that controls GU function, a lesion frequently results in GU deficits. By comparison, the cauda equina has roots of both lumbar and sacral origin, and GU sparing may occur.<sup>[6]</sup>

The uniqueness of this presentation lies, in the patient presenting with isolated features typical of cauda equina syndrome, despite the lesion being present at the level of conus medullaris. However, patient's neurological examination showed his reflexes being brisk in the left lower limb. This may be due to slight compression of the conus medullaris toward the left and anteriorly, as shown

by the MRI without any evidence of lumbar disc prolapse. The patient had back pain with right leg radiation and exaggerated left leg reflex, suggestive of a conus lesion. To the best of our knowledge, two cases have been reported with intradural arachnoid cysts, involving the conus. Most of these cases were associated with progressive paraparesis and lower back pain of variable duration.<sup>[8,9]</sup> Only one of the cases in the pediatric age group presented with neurogenic bladder and cauda equina syndrome, following conus medullaris compression.<sup>[7]</sup>

Treatment options for intradural arachnoid cysts include surgical resection, fenestration of the cyst wall, and percutaneous drainage or shunting to the peritoneum, the atrium, or the pleura. Many authors recommend total removal of the cyst as the preferred treatment. Preoperative aspiration under computed tomography or MRI guidance can help identify the communication between the cyst and subarachnoid space. Symptom recurrence the following aspiration is suggestive of a persistent communication. A posterior approach with laminectomy has been suggested for the removal of a dorsally located cyst. The outcomes of cyst excision are excellent.<sup>[5]</sup>

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#### Conflicts of interest

There are no conflicts of interest.

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