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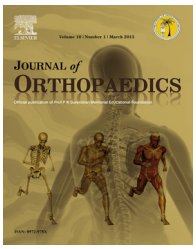

Case Report

Extensive spinal intradural arachnoid cyst exhibiting a "double cord sign" on magnetic resonance imaging

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ABSTRACT

Study design: Retrospective case study.
Objective: To report on a case with an extensive intradural arachnoid cyst that caused left hemiparesis.
Summary of background data: Intradural arachnoid cysts are not common causes of spinal cord compression and myelopathy. Although arachnoid cysts of the spine have been occasionally reported, cases with extensive intradural arachnoid cysts associated with hemiparesis are rarely reported.
Method: The patient was a 43-year-old woman who had cervical myelopathy symptoms, including radiating pain and left limb hemiparesis with gait disturbance. Magnetic resonance imaging revealed an extensive intradural extramedullary multi-septated cyst from the C6–T12, exhibiting a double cord sign on the T2-weighted axial image of the spine. The mass blocked normal cerebrospinal fluid flow, which led to cord compression. Two stages of operations were planned because of the patient's health status. The patient underwent laminectomy and cyst wall resection on the level of the T5–T7, which had the most compressed lesion. From C6–T2, a right side unilateral laminectomy was performed to resolve the right limb's neurology after the first operation.
Result: Hypoesthesia and the radiating pain were improved immediately postoperatively; however, motor power at the C8–T1 level of the right unaffected side was impaired and included finger abduction and finger flexion, which decreased to 4/5. During the second operation, the arachnoid cyst was exposed by performing a right unilateral laminectomy. The patient's neurologic symptoms were improved without neurologic sequelae.
Conclusion: In the case of an extensive cyst that exhibits a double cord sign, an intradural arachnoid cyst should be suspected as a differential diagnosis. Without radical excision of all lesions, neurologic symptoms can be recovered by performing selective resection and CSF normalization can be achieved even at extensive levels.

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1. Introduction

Although arachnoid cysts of the spine are occasionally reported, cases with extensive intradural arachnoid cysts associated with hemiparesis are rarely reported. Intradural arachnoid cysts of the spine are uncommon lesions[1] that cause spinal cord compression and are described by other symptoms.[2] In most cases, acquired arachnoid cysts in adults caused by infection, cord trauma, or other mechanisms result in inflammation and subarachnoid adhesions.[3–6] Arachnoid cysts are usually located in the mid-thoracic spine to the lower thoracic spine, are more rare in cervical lesions, are mainly in a posterior position instead of an anterior position,[7] tend to be symptomatic during the second decade of life,[2] and are more common in males than females.[8] Many theories have been suggested to explain the cyst formation and mechanism of symptoms. Perret et al proposed that they are caused by diverticulum in the septum.[6,9] Fortuna et al[10,11] suggested that strangulation of the arachnoid granulations can produce cerebral spinal fluid (CSF), which becomes blocked by the arachnoid diverticulum. These fluid sequestrations lead to further disruption of the normal CSF flow, which can expand and cause syringomyelia. The clinical manifestations of arachnoid cysts are similar to those of cervical myelopathy, such as paresis, radicular pain, paresthesia, and gait disturbance. Headaches can also be the main symptom in patients with a cervical arachnoid cysts, while some experience urinary incontinence.[12] According to other authors, severe flattening of the spinal cord due to a cyst and a long-term duration of paresis are predictors of a poor outcome, especially in the elderly.[13] The treatment of choice is complete cyst removal[2,6,12]; however, if this is not possible, partial resection in the affected levels can be performed.[12] We report on a case with an extensive intradural arachnoid cyst, which had a double cord sign on magnetic resonance imaging (MRI) and was associated with left hemiparesis.

2. Case report

2.1. *Presentation and examination*

A 43-year-old woman presented with a history of 6 months of hypoesthesia and gait disturbance and radiating pain in the left limbs, without any previous history of trauma or infection. She underwent non-surgical physiotherapy for 6 months without any improvement. Patient had gait disturbance in addition to difficulty in controlling her sphincter reflexes that modulate defecation and micturition. The physical examination demonstrated motor power with a 4/5 strength grade for all muscle groups in the left extremities, and the knees had hyper-reflexive responses. The sensory examination showed reduced proprioception and vibratory sensation in her left limbs. Computed tomography (CT) of the whole spine showed thinned pedicles, an increased diameter of the spinal canal, and a posterior scalloping distortion of the vertebral bodies, especially from C6–T12. Preoperative MRI demonstrated an extensive posterior intradural extramedullary arachnoid cyst from the C6–T12 vertebral bodies (Fig. 1). The spinal cord was compressed and flattened anteriorly. From T6–T8, the shape of the cyst, which faced the cord, appeared as if it had a stack of circles (i.e., a double cord sign) (Fig. 2).

2.2. *Surgical procedure*

Since the cystic structure was extended considerably from C6–T12 and considering the condition of the anemic patient, a staged operation was scheduled to be performed sequentially within 1 week. The patient was planned to undergo the first operation on the T5–T9 lesion, which was the most compressed location. General anesthesia was administered, and the patient was in the prone position. Continuous electrophysiologic monitoring for somatosensory and motor evoked potentials was utilized in our case to monitor any neurologic changes that might occur during the operation. Total laminectomy was performed from T5–T8 to expose the arachnoid cyst. As soon as the laminectomy was complete, a thin-walled expended dura, including the cystic structure occupying the canal, was found. Prior to cyst removal, durotomy was performed using a knife and Pott scissor. The cystic fluid was colorless, the CSF had accumulated in each septum so that the normal flow of CSF was not observed, and the cord was also compressed with considerable pressure caused by the septated cystic structure (Fig. 3). The cystic structure was

Fig. 1 – Preoperative sagittal T2-weighted magnetic resonance imaging (MRI) of the spinal column. It demonstrates cord compression and the intramedullary arachnoid cyst extending from C6 to T9.