CASE REPORT

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Spinal arachnoid cysts – a report of two cases and a review of the literature

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Abstract: Two cases of spinal arachnoid cysts are presented in young adults. One lesion was in the dorsal region and the other in the lumbar region. Both lesions presented differently. Radiological examination revealed well-defined extramedullary non-enhancing lesions hyperintense on T2WI with no contrast enhancement causing compression of the structures of the vertebral canal. The cysts were excised totally and the dural defect was repaired. The case is discussed in the light of relevant literature.

Key words: spinal arachnoid cyst, spinal cord tumours, spinal cord lesion

INTRODUCTION

Arachnoid cysts are congenital lesions that arise during development from the splitting of the arachnoid membrane and contain fluid that is usually identical to CSF. Rarely, arachnoid cysts may follow infection or trauma. Arachnoid cysts in the spine are rare and are seldom a cause of spinal cord compression. In the spine region they almost always communicate with the intrathecal subarachnoid space through a small defect in the dura. Usually asymptomatic, in some cases can cause local and radicular pain, motor weakness of lower extremities, sensory disturbances, ataxia, and sphincter disturbances. The mainstay of treatment in patients with neurological symptoms is surgical removal of the cyst, together with ligation of the communicating pedicle and closure of the dural defect. The two presented cases of arachnoid cysts were symptomatic and required surgical intervention.

Case Descriptions. A 28-year-old male presented with a history of imbalance on closing his eyes and in darkness, followed by an insidious onset of progressive paraparesis over the four previous months with no history of antecedent trauma. On examination the patient was alert, fully oriented, with 2/5 spastic paraparesis. The knee and ankle jerks were brisk. The Babinski sign was positive bilaterally. Joint and vibration sensations were impaired in both legs. Laboratory tests did not demonstrate aberrations.

MRI revealed a well-defined extradural, extramedullary lesion hypo-intense on T1 and hyperintense on T2, with no contrast enhancement extending from Th5 to Th8, resulting in a right posterolateral compression of the thoracic cord. Laminectomy revealed an extradural cyst containing CSF with a stalk connecting it to the intradural space. The cyst was excised completely after ligation of the neck. The dural defect was subsequently sutured. Histopathology confirmed the lesion to be an arachnoid cyst. Postoperative course was uneventful. The spasticity and the muscle strength gradually improved to grade 5/5 five days after surgery. The patient was treated as an outpatient for a year. A further improvement in the clinical state was observed. MRI was performed one month after surgery and disclosed no recurrence of the cyst.

A 25-year-old female presented with a 2-week history of pain in the lower back radiating to the right leg. Neurological examination revealed positive Laseque sign on the right at 45°, with sensory loss in the right leg. Laboratory tests did not demonstrate aberrations. MRI disclosed a well-defined intradural extramedullary cyst at the L2/3 level, hypointense on T1 and hyperintense on T2 with no contrast enhancement. Laminectomy revealed an intradural cyst containing CSF with a stalk connecting it to the dura. The cyst was excised completely after ligation of the neck. The dural defect was subsequently sutured. Histopathology confirmed the lesion to be an arachnoid cyst. Once again, the postoperative course was uneventful. The pain subsided with no abnormalities on neurological examination two days after surgery. The patient was treated as an outpatient for a year. Periodic increasing pain in the lower back with radicular radiation were observed; however, pain intensity were less than before the operation. MRI was performed one month after surgery and disclosed no recurrence of the cyst.

DISCUSSION

Spinal arachnoid cysts, also called spinal meningeal cysts, are rare; nonetheless, they have been reported in all age groups with a slight preponderance in females [1]. Their etiology is unclear; however, congenital [2], traumatic [3] or inflammatory [4] mechanisms have been proposed. Pulsatile CSF dynamics [5], osmotic gradient between the subarachnoid space and cyst [6] as well as the valve-like mechanism between the cyst and subarachnoid space [7] may also play an important role in the enlargement of spinal extradural arachnoid cysts. They develop as a result of out-pouching of the arachnoid layer, most commonly in the thoracic spine [1]. Nearly 80% of them are located posterior to the spinal cord [1] with preserved communication with the subarachnoid space. Plain x-rays might show signs of the probable space of the occupying lesion. CT myelography [CTM] usually shows a compressed

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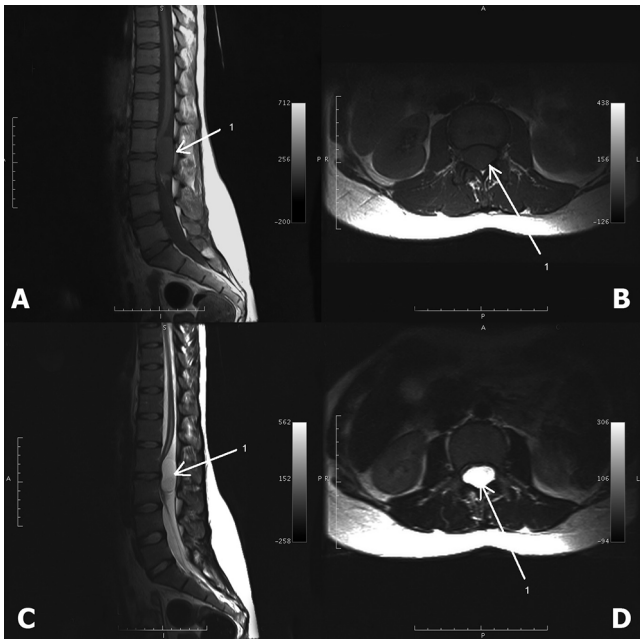

Figure 1 A – T1WI sagittal, B – T1WI axial, C – T2WI sagittal, D – T2WI axial images show a well defined extradural extramedullary lesion causing posterior compression on the thoracic cord, 1 – Arachnoid cyst.

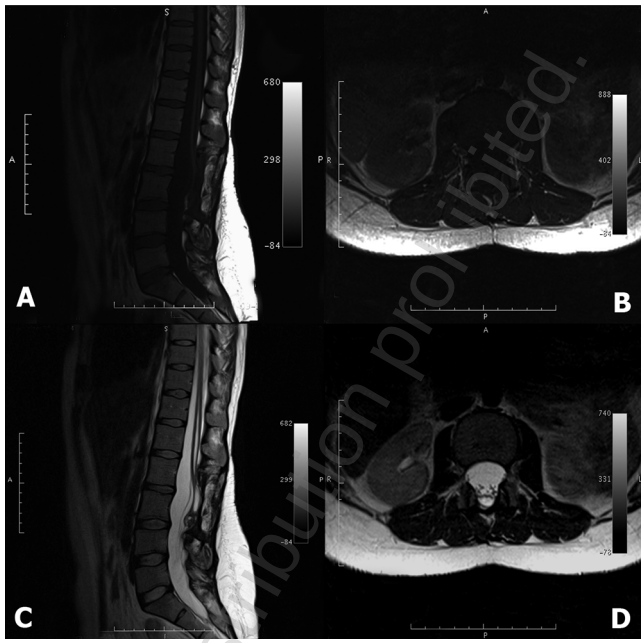

Figure 2 A – T1WI sagittal, B – T1WI axial, C – T2WI sagittal, D – T2WI axial images show complete removal of an extradural extramedullary lesion.

thoracic cord displaced anteriorly [1]. Importantly, CTM is essential to disclose the communication between the cyst and the subarachnoid space that is necessary for the accurate diagnosis [7]. MRI, on the other hand, shows a non-enhancing extramedullary loculated cyst displacing the cord and nerve roots with signal intensity similar to CSF [1]. Therefore, MRI may fail to demonstrate intradural arachnoid cysts unless the cord appears displaced and flattened [2].

Clinically, spinal arachnoid cysts present with symptoms of cord and root compression depending upon the location. Backache and leg weakness are the most common signs. Urinary incontinence, sexual disturbances, as well as numbness of legs may also be present.

Histopathological confirmation of the nature of the cell wall (arachnoid) is not always possible; hence they are named meningeal cysts. Foci of calcification may be seen. The cyst contains clear fluid like CSF [1]. The grading system proposed by Nabors et al [7] includes 3 types: type I – extradural arachnoid cyst without nerve roots; type II – extradural arachnoid cyst with nerve roots, and type III – intradural arachnoid cyst.

Surgical excision is the treatment of choice. Closure of the dural defect/connecting stalk with the arachnoid space is vital, otherwise CSF leakage will occur. Prognosis is good with a total excision, stalk ligation and duroplasty. Intradural lesions tend to recur [3]. Two reviewed cases are typical. We decided on surgical intervention because of increasing clinical symptoms. The surgical approach and technique were typical, although we also considered needle puncture. In our opinion, surgery is better in cases which neoplasm is suspected because of the possibility of biopsy. We also maintain that the frequency of recurrences is rarer in cases of surgery. We achieved satisfying results of treatment similar to those described in the literature.

CONCLUSION

The pathogenesis, etiology, and treatment of spinal arachnoid cysts have not been well established because of their rarity. Symptomatic cases, however require surgical intervention. For long segment involvements, laminectomy or laminotomy is performed with subsequent cyst excision and duroplasty. Neurological recovery depends on the size of the cyst, together with the degree and duration of the spinal cord compression. A long-standing spastic myelopathy is unlikely to have significant improvement.

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