

Solitary Symptomatic Spinal Extradural Arachnoid Cyst Needing Surgical Treatment: A Series of Three Cases

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ABSTRACT

Extradural arachnoid cysts are rare lesions which may produce symptoms by compressing the spinal cord or nerve roots. Surgery is the treatment of choice in such lesions but asymptomatic patients can be managed conservatively. We present three cases of symptomatic extradural arachnoid cysts managed at our institute. Magnetic resonance imaging (MRI) done in all cases showed an extradural arachnoid cyst at Dorsal (2 cases) and cervical (1 case) level. All patients were operated with successful result. The pathophysiology, symptomatology, investigations and treatment options of this rare condition are described in relation to our cases.

Key messages: Extradural arachnoid cysts are rare lesions which may produce symptoms by compressing the spinal cord or nerve roots. Surgery is the treatment of choice in such lesions but asymptomatic patients can be managed conservatively. Symptomatic patients have good results with surgical excision of the cyst.

Keywords: Arachnoid cyst, Dorsal cord, Extradural cyst, Meningeal cyst.

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INTRODUCTION

Cerebrospinal fluid (CSF)-filled meningeal cysts are also called as 'arachnoid cysts,' 'diverticula,' or 'pouches' and may be located in the intradural, extradural, or perineural spaces.¹ Extradural spinal arachnoid cysts are rare lesions and these cysts being symptomatic are even less common.² Arachnoid cysts may cause symptoms by compressing the spinal cord or nerve roots.³ They are usually located in the posterior parts of the middle or lower thoracic spine.⁴ The standard management is surgery,

which includes complete resection of the cyst wall and the subarachnoid space after laminectomy of the affected vertebrae but there is a significant role of observation in asymptomatic or minimally symptomatic patients.⁴

CASE REPORTS

Case 1

A 45-year-old lady presented to us with backache in the mid dorsal region with radiation to the sacrum. Examination showed no motor or sensory deficits. Magnetic resonance imaging (MRI) showed an extradural lesion at the level of D7 to D8 which was hypointense on T1W and hyperintense on T2W with compression of spinal cord at D7 to D8 level (Figs 1A and B).

The patient was operated in prone position. D7 to D8 laminectomy was performed. The cyst was identified as a thin walled sac containing CSF. The cyst was marsupialized and the connection with the spinal canal was identified and disconnected. The patient was extubated on table and had no postoperative deficits. She improved symptomatically in her pain and was asymptomatic at 1 year follow-up. Magnetic resonance imaging performed then showed no residual or recurrence of the lesion (Fig. 1C).

Case 2

A 35-year-old female presented to us with history of tingling numbness in both upper limbs (left more than right). She also had complains of neck pain which was not relieved with analgesics, since almost a year. Examination showed no sensory or motor deficits. Magnetic resonance imaging showed an extradural arachnoid cyst at C1 to C2 level on left side of the spinal canal displacing the cord to the right (Fig. 2A).

In sitting position, C1 to C2 hemilaminectomy was performed. The cyst was marsupialized but no connecting sleeve could be identified. Following surgery, patient improved in her symptoms and is now symptom free. Postoperative MRI done at 6 months interval shows complete excision of lesion with no recurrence (Fig. 2B).

Case 3

A 4-year-old male child came to us with history of frequent tripping while walking. There was occasional

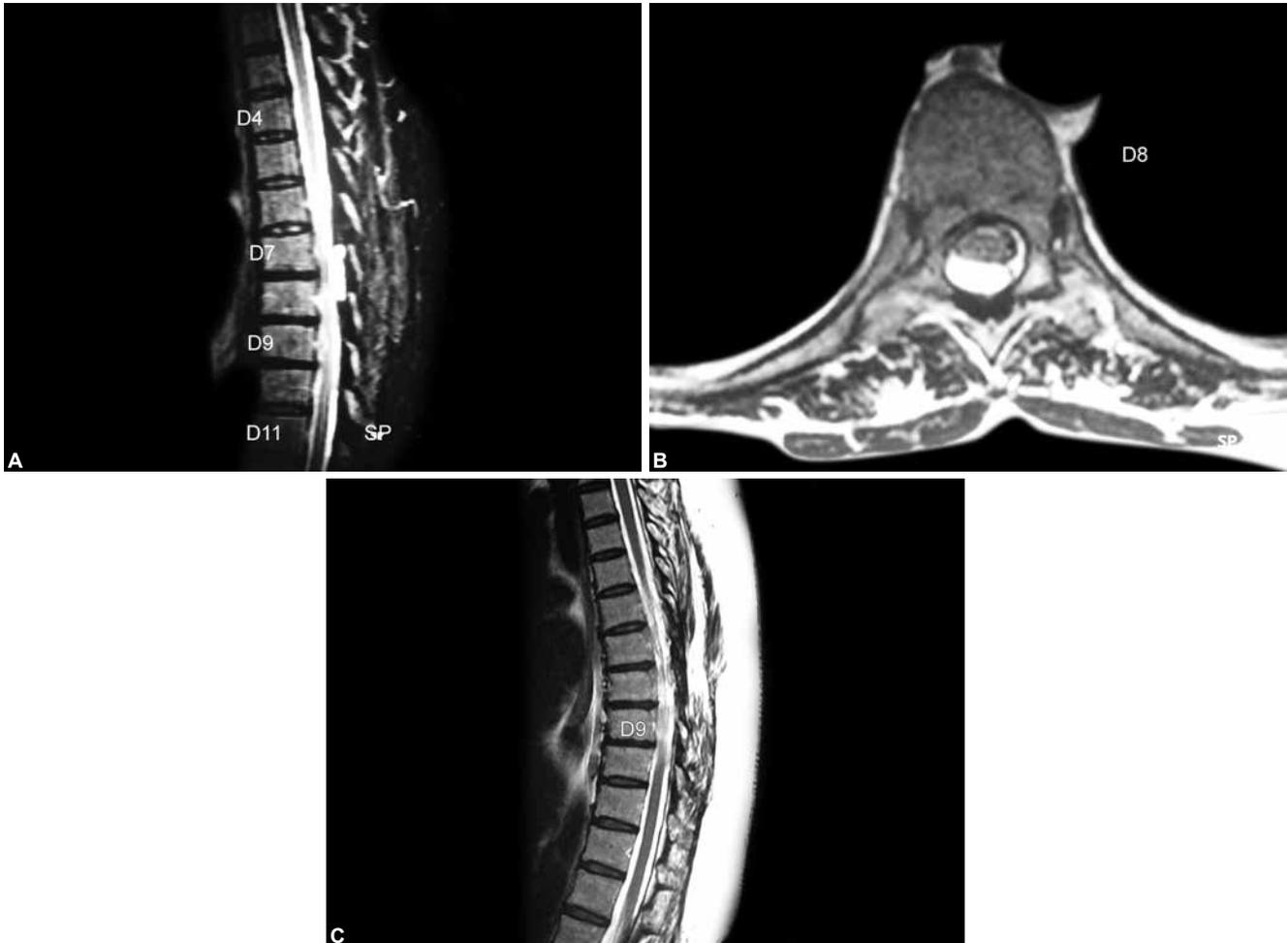
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slippage of footwear from his foot. Examination revealed power of grade 4+ in both lower limbs. There was no bowel/bladder disturbance. Magnetic resonance imaging revealed a large extradural arachnoid cyst at D4 to D6 level (Fig. 3A).

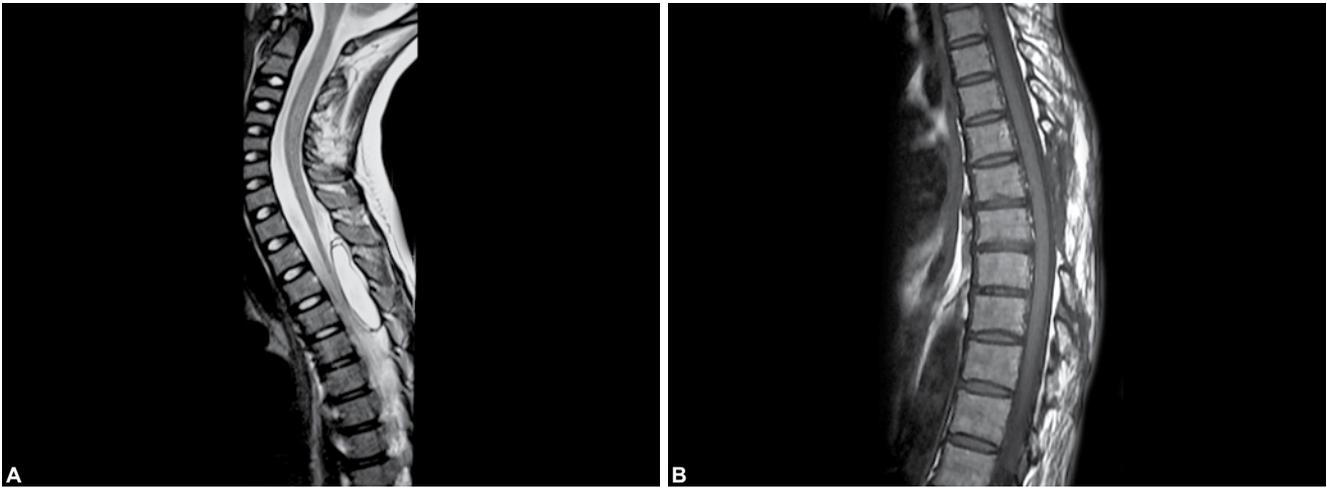
In prone position, D4 to D5 laminectomy with marsupialization of cyst with disconnection of the cyst was done. At 1 year follow-up, the child has improved in both lower limb power. Postoperative MRI shows complete excision of cyst with no recurrence (Fig. 3B).



Figs 1A to C: (A and B) T2W sagittal and axial image at the level of D8 vertebra showing the cystic lesion which is midline dorsal with extension on the right side and compressing the cord and (C) postoperative T2W sagittal image showing complete obliteration of the cystic cavity with postoperative changes



Figs 2A and B: (A) T2W sagittal image of the cervical vertebra showing the hyperintense lesion which is midline dorsal with extension on the left side and exiting through the C1 to C2 foramen and (B) T2W axial image at C1 to C2 vertebral level showing the complete excision of lesion with postoperative changes



Figs 3A and B: (A) T2W sagittal image of the cervico dorsal vertebra showing the hyperintense lesion which is midline dorsal and (B) T2W sagittal image of the dorsal vertebra showing the complete excision of lesion

DISCUSSION

Spinal arachnoid cysts were first described by Spiller in 1903, although the first reported case is traced back to 1898 by Nonne (an autopsy finding). Most of the reported cases are solitary ones.⁵ Extradural cysts occur most frequently in the thoracic spine (65%) followed by lumbar and lumbosacral (13%), thoracolumbar (12%), sacral (6.6%), and cervical (3.3%) regions. They can occur either dorsal or ventral to the cord, with the former being more common.⁶ Dorsally situated arachnoid cysts usually originate from a point close to a dural root exit or in the posterior midline.⁵ All the patients in our series had dorsally situated arachnoid cysts, two at dorsal level and one at high cervical level.

The peak age of presentation is the early second decade of life. Thoracic cysts usually occur in young adolescents, whereas thoracolumbar and lumbar cysts usually appear in adults in the 3 to 4th decade of life. This may be due to relatively smaller diameter of spinal canal in thoracic region.⁶ In our series, one patient was a child, one was in third and one in fourth decade of life.

The cysts have a pedicle which connects them to the subarachnoid space, located dorsally or along a root sleeve. We could find the pedicle in two of our cases. These defects may be congenital or acquired.^{3,4} An association with congenital neural tube defects has been reported. Another theory suggests that they represent a congenital diverticulum of the dura mater.⁴ Acquired variant may be secondary to previous inflammation, surgery or spinal trauma. None of these factors were present in our cases, making us think in terms of congenital lesion.⁷ The mechanism of cyst enlargement may be due to active CSF secretion from residual arachnoid matter or a ball-valve effect in which CSF is trapped in the cyst since the backward reflux is prevented at the neck of the diverticulum.⁴

The most common presenting symptoms are pain, paresthesia, intermittent claudication, and variable degrees of spastic weakness. Bowel or bladder dysfunction may occur with sacral cysts.⁴ Magnetic resonance imaging is the diagnostic procedure of choice as it is noninvasive and can demonstrate the cyst nature, exact size, and anatomic relationship with the spinal cord.² Radiographs of the spine usually show bone erosion with widening of the canal, erosion of pedicles, foraminal enlargement, and scalloping of the vertebral bodies or the sacrum. The diagnosis is usually established by myelography, which demonstrates an extradural defect with smooth displacement of the margin of the thecal sac. Computed tomography (CT) myelograms may demonstrate the communication between cysts and the subarachnoid membrane.^{2,4} Radiological differential diagnosis of extradural arachnoid cysts are neuroepithelial, neurenteri dermoid, epidermoid and teratoid cysts.⁸

Surgical treatment is indicated when there is spinal cord compression and cysts which are ventral in location due to risk of ischemia.⁷ Total cyst excision, obliteration of the communicating pedicle, and repair of the dural flaw is the treatment of choice of the symptomatic lesions.⁶ We have obliterated the pedicle in two of our cases and marsupialization in all cases. Several authors have found good improvement following surgical excision.^{1,6,7} Wide fenestration and shunting of the cyst to the peritoneum, pleural cavity or right atrium are also treatment alternatives when the site and size prevents total excision of the cyst.⁹ However, in patients with mild symptoms clinical and radiological follow-up may be indicated.⁴

Patients with extradural arachnoid cyst should be carefully chosen for surgical treatment. Symptomatic patients have good results in the form of relief of symptoms, with surgical excision of the cyst. Asymptomatic cysts can be managed conservatively with close neurological observation.

REFERENCES

1. Hamamcioglu MK, Kilincer C, Hicdonmez T, Simsek O, Birgili B, Cobanoglu S. Giant cervicothoracic extradural arachnoid cyst: a case report. *Eur Spine J* 2006;15(5): 595-598.
2. Chang IC, Chou MC, Bell WR, Lin ZI. Spinal cord compression caused by extradural arachnoid cysts: clinical examples and review. *Pediatr Neurosurg* 2004;40(4):70-74.
3. Aithala GR, Sztriha L, Amirlak I, Devadas K, Ohlsson I. Spinal arachnoid cyst with weakness in the limbs and abdominal pain. *Pediatr Neurol* 1999;20(2):155-156.
4. Ergun E, Borcek AO, Cemil B, Dogulu F, Baykaner MK. Should we operate all spinal extradural arachnoid cysts? Report of a case. *Turkish Neurosurg* 2008;18(1):52-55.
5. Cloward RB. Congenital spinal extradural cysts: case report with review of literature. *Ann Surg* 1968;168(5):851-864.
6. Bitaraf MA, Zeinalizadeh M, Meybodi AT, Meybodi KT, Habibi Z. Multiple extradural spinal arachnoid cysts: a case report and review of literature. *Cases J* 2009;2(1):7531.
7. Joaquim AF, Da Silva EG, Dos Santos MJ, Honorato DC. Giant cervicothoracic extradural arachnoid cyst. *Arq Neuropsiquiatr* 2009;67(1):117-118.
8. Novak L, Dobai J, Nemeth T, Fekete M, Prinzing A, Csecsei GI. Spinal extradural arachnoid cyst causing cord compression in a 15-year-old girl: a case report. *Zentralbl Neurochir* 2005;66(1):43-46.
9. Prevedello DM, Tatsui CE, Koerbel A, Grande CV, Cordeiro JG, Araujo CJ. Ventral extradural spinal meningeal cyst causing cord compression. *Arq Neuropsiquiatr* 2005;63(3-B):855-858.