ANTERIOR CERVICAL INTRADURAL ARACHNOID CYST - A RARE CAUSE OF SPINAL CORD COMPRESSION

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ABSTRACT

BACKGROUND

Arachnoid cysts of spinal cord are relatively uncommon lesions. Most of them arise dorsal to the cord, and anteriorly placed intradural arachnoid cyst is a rare cause of cervical cord compression. To the best of our knowledge, only 30 cases were reported in the literature. We present a case of anterior cervical intradural arachnoid cyst with review of literature.

METHODS

We performed a literature search for anteriorly placed intradural arachnoid cysts in the cervical spinal cord through http://pubmed.com, a well-known worldwide internet medical address. To the best of our knowledge, only 30 cases were reported in the literature. We reviewed the literature with illustration of our case. We present a case of a 40-year-old male patient who presented with insidious onset of radicular pain. MRI cervical spine demonstrated cervical intradural cystic lesion extending from C2 to upper border of C4, lying anteriorly with compression over the cord. Cervical laminectomy followed by wide cyst fenestration and subtotal excision of cyst was done. Histopathological diagnosis was arachnoid cyst.

RESULTS

Patient totally recovered from his pain and sensory symptoms within a week and motor symptoms improved gradually over a period of six to eight weeks. With two years followup, patient had no further complaints.

CONCLUSION

Anterior cervical intradural arachnoid cysts are rare. These are amenable to resection through posterior approach safely with good postoperative recovery.

KEYWORDS

Arachnoid Cyst, Cervical Spine, Spinal Intradural Cyst.

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INTRODUCTION: Arachnoid cysts of spinal canal are rare cause of compressive pathology.[1] These cysts can be extradural or intradural and are commonly seen in dorsal spine followed by lumbar and cervical.[2] Most of the cysts arise posteriorly to the cord. Anteriorly placed arachnoid cysts are rare and those arising in the cervical spine are very rare and to the best of our knowledge only 30 cases were reported in the literature till now.[2,3,4,5,6]

REVIEW OF LITERATURE: In May 2016, we performed a literature search for anteriorly placed intradural arachnoid cysts in the cervical spinal cord with no limitation for language and publication date. The search was conducted through http://pubmed.com, a well-known worldwide internet medical address. We present a case with anteriorly placed arachnoid cyst that was excised with good post-operative recovery with review of literature emphasising on aetiology, clinical features, management and results. A 45-year-old man presented with severe neck pain, radiating to right upper limb, insidious onset weakness of right upper limb and numbness, had exacerbation of symptoms on postural changes and also with Valsalva manoeuvre. On examination, patient had right upper limb spastic monoparesis with power of 2/5 with exaggerated deep tendon reflexes present. MRI cervical spine T1 weighted images demonstrated intradural extramedullary hypointense cystic mass extending from C2 to upper border of C4, resembling CSF anterior to cervical cord with significant compression (Figure 1).

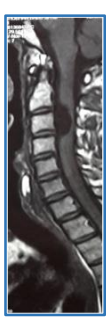

Fig. 1: T1 Weighted images show Hypointense Cystic Mass resembling CSF Anterior to Cervical Cord with Significant Compression

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On T2 weighted images, a focal, oblong, well-defined CSF intensity extramedullary intradural lesion abutting the posterior vertebral margin, extending from C2 to upper border of C4 lying anteriorly on right side with compression on the cord (Figure 2). Cyst did not enhance after the contrast.

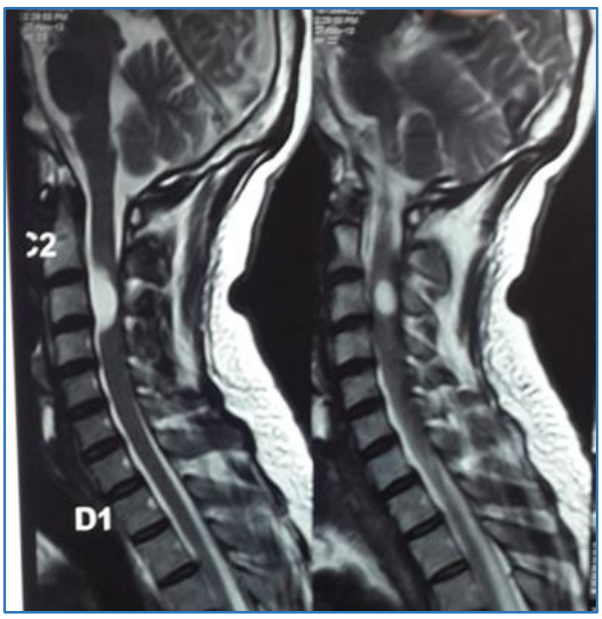

Fig. 2: T2 Weighted Images showing Focal, Oblong, Well-defined CSF Intensity Extramedullary Intradural Lesion abutting the Posterior Vertebral Margin, Extending from C2 to Upper Border of C4

With C2, C3, C4 laminectomy, cyst fenestration and subtotal excision of the cyst was done. Histopathologically, a multiloculated cyst lined by leptomeningeal cells with thin fibrocollagenous walls, consistent with arachnoid cyst (Figure 3). Postoperative period was uneventful and patient recovered from his pain and sensory symptoms within a week and motor weakness improved over a period of six to eight weeks. Patient was followed for twenty months without any symptoms.

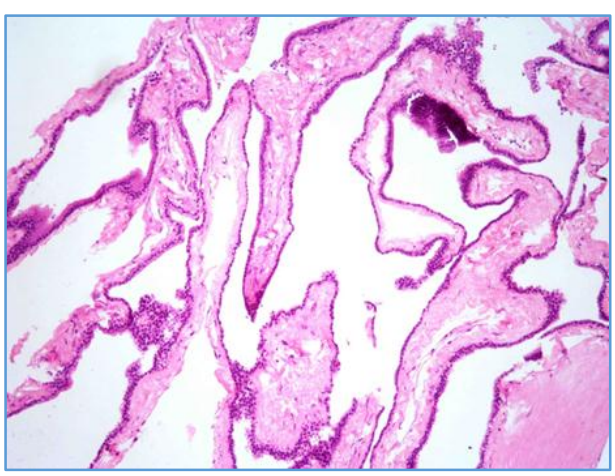

Fig. 3: Histopathological Section showing Multiloculated Cyst lined by Leptomeningeal Cells with Thin Fibrocollagenous Walls, consistent with Arachnoid Cyst

DISCUSSION: Arachnoid cysts of the spinal cord accounts for 1% of primary spinal cord tumors[7]. They can be extradural or intradural. Intradural arachnoid cysts are rare and they commonly arise in the thoracic spine followed by lumbar and cervical region and these cysts arise posterior to the cord.[1] But intradural anteriorly placed arachnoid cysts in the cervical region are very rare and only 30 cases were reported in the literature to the best of our knowledge.[2,3,4,5,6]

Nabors[8] et al classified arachnoid cysts in to three types and all intradural cysts will come under type 3.

Classification of spinal meningeal cysts:

Type	Description
I	Extradural meningeal cysts without spinal nerve root fibres.
I	A) Extradural meningeal cyst (Extradural arachnoid cyst).
I	B) Sacral meningocoele (Occult sacral meningocoele).
II	Extradural meningeal cysts with spinal root fibres. (Tarlov perineural cyst, spinal nerve root diverticulum).
III	Spinal intradural meningeal cysts (intradural arachnoid cyst).

Aetiology of intradural arachnoid cysts remains obscure. They can be congenital or acquired.[1]

Congenital or idiopathic arachnoid cysts are commonly seen in children without evidence of meningitis or trauma. Rabb[9] et al reported these cysts with neural tube defects indicating congenital origin of these cysts. Arabi[10] and colleagues have reported two cases in two generations with Mendelian dominant variant, postulating these cysts are a result of a widening of the septum posticum. But this hypothesis will support dorsally placed arachnoid cysts but not all the cases.[1] Agnoli[11] et al reported these can be due to pathological distribution of arachnoid trabeculae leading in to diverticula, resulting in cyst formation due to degeneration of trabecular cells resulting in building up pressure within the cyst with transudation of fluid within. This hypothesis was supported by Kazan et al.

Acquired arachnoid cysts are more common and may be secondary to trauma, meningitis due to viruses, bacteria, spirochetes and chemical meningitis secondary to sub arachnoid haemorrhage, spinal operations, contrast media, spinal anaesthetic agents.[1]

Trauma is having a role in development of arachnoid cyst by producing a tear in the arachnoid or by triggering a silent cyst in to symptomatic one.[1,2,12]

Chen and Chen[13] reported a case with 9 years old, history of trauma stating fibrous thickening of the arachnoid membrane may be the reason for development of cyst. Jean[14] et al reported two cases following foramen magnum decompression for Chiari II malformations. They thought extensive craniocervical decompression may alter the CSF pressure dynamics in such a way that the anterior subarachnoid space, previously compressed may dilate

resulting in cyst formation and may be because of perimedullary arachnoiditis.

Arachnoid cysts are filled with clear fluid of low protein comparable to CSF. Expansion of the cyst volume could be due to secretion by the cystic wall, unidirectional value and liquid movements secondary to pulsations of the veins.[15]

Most of these cases were reported in children in the age group of 1-10 years with the youngest 16 days' old baby,[3] indicates congenital or idiopathic nature of these anteriorly placed lesions. Anteriorly placed lesions are commonly seen in males as compared to the posteriorly located lesions.[15]

Spinal arachnoid cysts are usually asymptomatic. The clinical picture depends on the level of the compression on the cord.[7]

But these can produce symptoms by the mass effect of cyst on the spinal cord or on nerve roots suddenly or progressively. Congenital asymptomatic cysts may become symptomatic after traumatic aggravation and extension.[1]

Symptoms may fluctuate, change upon the position of the patient and increase during Valsalva manoeuvre.[7] Maiuri[16] reported a case with episodes of tetraplegia followed by complete remission explained by sudden increase in the amount of CSF and pressure within the cyst with Valsalva manoeuvre and by compression over the feeding arteries of the cord by the cyst.

The clinical picture depends on the compression of the cord by the cyst. Most commonly patients present with neck pain, radicular pain or with myelopathic syndromes. Neurological signs include quadriparesis, monoparesis, paraparesis, sensory changes, gait changes and bladder and bowel disturbances.[1,7] Two cases were reported with syringomyelia .[5,17] Need for re-evaluation in patients with known syringomyelia presents an atypical clinical picture.[17] Patients can present with respiratory failure if they are located in the upper cervical region.[15]

Plain x-ray in some cases demonstrates enlargement of the spinal canal at the cyst level, with co-existent scoliosis and kyphosis in some cases, but plain x-rays usually not helpful to diagnose these cysts.[1,7]

Before MRI, the diagnosis was made by myelography and CT Myelography. CT myelogram will give the details about cyst communication to the dura.[1,7]

Currently, MRI is the gold standard investigation of choice to diagnose arachnoid cysts.[1,2,7] MRI will give the extent, size and nature of these cysts and as well as the mass effect on cord and associated signs of arachnoiditis.

Cysts are isointense on T1 weighted images and heterogenous signal intensity with high protein content cysts. Loss of CSF–cord interface is suggestive of arachnoiditis.[1,7] Differential diagnosis includes dermoids, epidermoids, hydatids, and neurocysticercosis.

Symptomatic cysts require surgical management. Options are excision, fenestration or placement of a shunt. Whenever possible complete excision is the treatment of choice, but in some cases total excision is not possible because of adhesions to the cord or roots, scarring, and ventral cyst location.[1,2,7] In these cases, wide fenestration with partial resection can be done with good results. Various treatment options were reported in the literature. Resection of cyst, aspiration of cyst, aspiration and reservoir placement, cystoperitoneal, pleural or atrial shunts and MRI guided cyst aspiration.[2] Posterior approach is easy and safe and even with partial resection with wide fenestration has excellent results. Four cases were operated through anterior approach[2,4,18,19] with good results offering direct access to the cyst with excision or fenestration to the subarachnoid space with good results. But anterior approach is not the common procedure to be done and it remains open for discussion.

Of 31 cases including present case reports, twenty seven patients improved well, one patient showed partial improvement, one patient did not show any improvement and two deaths were reported.[15,20] Patients with arachnoiditis and adhesions did not show much improvement. Patients who presented with respiratory depression died in spite of surgery.[15,20]

To conclude, anterior intradural arachnoid cysts in the cervical region are very rare lesions and they can be easily diagnosed with MRI, and total excision is the treatment of choice whenever possible with excellent postoperative outcome.

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