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Goel's Teflon sponge internal shunt for anterior spinal arachnoid cyst

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Abstract

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We report a case of a 6-year-old boy who presented with progressive quadriparesis and bowel-bladder incontinence. Magnetic resonance imaging (MRI) of the spine showed anteriorly located arachnoid cyst in the cervicodorsal region. Following marsupialization of the cyst, an internal Teflon sponge shunt (Goel's shunt) was done that extended from the cyst cavity to the subarchnoid space. The patient improved dramatically in his symptoms. The physical nature of the teflon sponge and its usefulness as an internal shunt are discussed.

Keywords: Internal shunt, spinal arachnoid cyst, teflon sponge

INTRODUCTION

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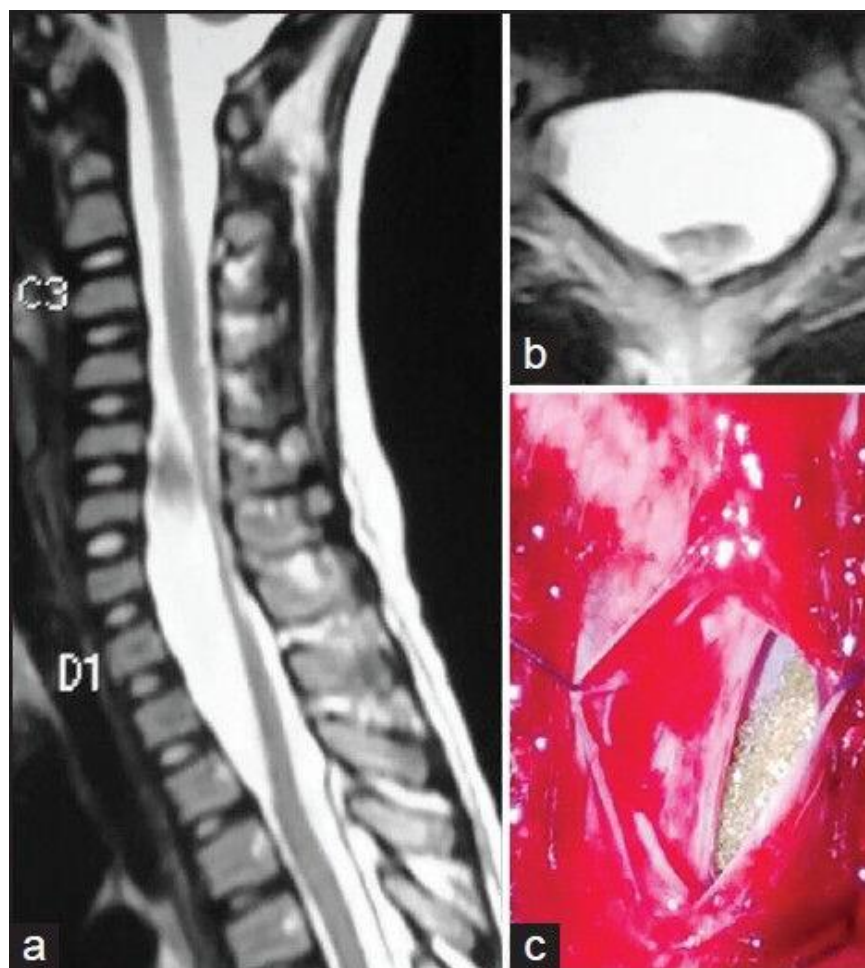
Spinal arachnoid cysts are relatively rare but a frequently encountered entity. Whilst surgical evacuation of the cyst content can be a relatively straightforward procedure, radical cyst wall resection may not always be possible. Recurrence of cyst has been frequently encountered and reported in the literature.[\[1,2\]](#) We report the usefulness of internal shunt from the cyst to the subarachnoid space using a teflon sponge. Such an internal shunt was first reported in the year 2007.[\[3\]](#) Since then the use of such internal shunts for other indications have been recorded.[\[4,5\]](#) We report a case of anteriorly located cervico-thoracic archnoid cyst that was successfully treated by marsupialization and Teflon sponge internal shunting.

CASE REPORT

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A 6-years-old boy was brought by parents with complains of progressive quadriparesis for last 3 years and bowel bladder incontinenece for last 6 months. On neurological examination patient had spastic Grade 3 quadriparesis. His joint position sense and vibration sensation were remarkably impaired in all four extremities. Touch and pinprick sensations were preserved. Magnetic resonance imaging (MRI) of the spine showed anteriorly located extra axial cystic lesion in the cervicodorsal region causing marked posterior displacement of the cord [Figures [1a](#) and [b](#)]. The lesion was approached from the posterior midline exposure. A characteristic arachnoid cyst was encountered. The cyst wall was thin, remarkably adherent to to the dura and to the cord and was inseparable and indistinguishable from the adjoining normal arachnoid memberane. The cyst contents resembled normal CSF. The cyst was opened and fluid was drained. As the cyst wall could not be completely removed an internal teflon sponge shunt was placed that extended from the cyst cavity to the subarachnoid space. The teflon sponge was a 4 mm

thick, 8 mm wide and 20 mm long strip [Figure 1c]. The patient improved significantly after surgery and was well at follow-up.



[Figure 1](#)

(a and b) are T2 weighted sagittal and axial magnetic resonance images (MRI) of cervico thoracic spine showing cystic lesion ventral to the cord causing posterior displacement of the cord. (c) is intra operative photograph showing teflon sponge extending from arachnoid cyst to subarachnoid space

DICUSSION

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Since the first reported case by Collins and Marks in 1915, spinal arachnoid cysts have been identified and reported as case reports and small case series.[1,2] Arachnoid cysts have been identified in the intradural and extradural locations of the spinal cord.[6] Dorsal spine and preference to location anterior to the cord has been uniformly observed. The exact pathogenesis of the cyst has remained a subject of debate. Trauma, infection, hemorrhages and similar such causes have been implicated as possible causes. Idiopathic arachnoid cysts in children are sometimes associated with neural tube defects and in adults with spinal deformities.[1,2] Whilst some authors consider the fluid contained within the cyst to be CSF and in continuity with the adjoining CSF spaces, others consider arachnoid cyst to be a discrete cavity entirely isolated from the normal CSF spaces. The source of the fluid contained within the arachnoid cyst can only be speculated as no arachnoid granulations or similar structures have been identified within its confines. The cysts contain fluid under pressure as they have

frequently been identified to result in compressive effects on the cord. The significant distortion of the cord and relatively subtle presenting symptoms suggests its long-standing and slow progressive nature. As against intracranial arachnoid cysts that are more frequently asymptomatic and probably arise as a primary formation rather than a brain destructive formation, spinal cysts appear to be more often pressure cysts. The discussed forms of treatment range from cyst drainage, cyst marsupialization to cyst wall resection.[1,2] As the location of the cysts, like in our case, is more often on the anterior surface of the cord, exposure of the entire cyst and complete wall resection can be difficult. Also, the cyst wall can resemble adjoining arachnoid membrane and its identification and resection may not be possible. As recurrence of arachnoid cyst after partial or even after total wall resection is rather frequent, cysto-subarachnoid and cysto-peritoneal shunts have rarely been advocated. Teflon shunt as discussed can effectively reduce the incidence of recurrence and can be used at the time of first operation. The teflon sponge shunt has multiple small holes and blockage and dysfunction can be less frequent. As the sponge material is stretchable and flexible, occlusion by kinking appears to be less likely. As the sponge is compressible and deformable, it can easily be passed through openings smaller than its size. Teflon sponge is like “hundreds” of shunts in one shunt and can be an effective mode of internal shunting. It is commonly available, cheap and biocompatible in laboratory as well as animal studies. Teflon is brand name for the compound polytetrafluoroethylene.[4] Teflon sponge has been widely used in microvascular decompression surgery. It has been used as a internal shunt in recurrent arachnoid cyst surgery in the posterior fossa,[3] recurrent brainstem neoplastic cyst[4] and in cervico dorsal syringomyelia.[5] Teflon sponge was first discussed for recurrent cranial arachnoid cyst. Its use for spinal cyst has not been discussed earlier. It is ideal material for use in neurosurgical procedures due to its non-absorbable and nonreactive nature.[3] It appears that teflon sponge internal shunting can be an effective primary mode of surgical treatment, particularly for anteriorly located arachnoid cysts.

CONCLUSION

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Teflon sponge as an internal cysto subarachnoid shunt could constitute an effective primary modality of treatment for spinal arachnoid cysts.

Footnotes

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Source of Support: Nil

Conflict of Interest: None declared.

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