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Spinal Extradural Arachnoid Cyst about a Case and Review of the Literature

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Abstract

Spinal extradural arachnoid cyst (SEDAC) develops from a protrusion of the arachnoid through a defect in the dura mater in young adulthood. Its location is variable. It is a rare cause of spinal cord compression whose origin can be congenital or acquired following trauma, infection or inflammation. MRI remains the key examination, it studies the characteristics of the cyst. The treatment of SEDAC is surgical by total excision of the cyst with a generally good prognosis. The objective of this work to shed light on this pathology and the importance of early treatment to avoid progressive neurological deterioration and to show its clinical, paraclinical and therapeutic particularities.

Keywords

Spinal Arachnoid Cyst, Spinal Cord Compression, MRI

1. Introduction

The arachnoid cyst is an arachnoid formation whose wall is arachnoid. It can develop wherever there is arachnoid, especially in the cisterns, rare in the spine. It contains cerebrospinal fluid (CSF) of the same composition as the neighboring CSF, and communicates with the contiguous arachnoid spaces, allowing regular exchange of intracystic fluid. Spinal extradural arachnoid cyst (SEDAC) is a rare cause of spinal cord compression [1]. Its thoracic location is the most frequent (65%), the lumbosacral region (13%), thoraco-lumbar (12%), sacral (7%) and the cervical region (3%). SEDAC develops from a protrusion of the arachnoid through a defect in the dura mater. The cyst has a neck in communication with the spinal subarachnoid space and contains CSF. The cause of these cysts is not yet definitively determined, but most likely has a congenital or acquired origin following trauma, infection or inflammation. MRI remains the key examination

tool for detecting cystic mass, its extent, topography, and characteristic signals similar to those of CSF. Treatment of SEDAC is surgical if the patient becomes symptomatic; this treatment aims to perform total excision of the cyst and ligature of its neck [2] without neurological sequelae related to the compression applied by the cyst to the spinal cord.

2. Observation

We report below the experience of the Neurosurgery Department CH of Nouadhibou concerning the management of SEDAC in a patient M. F, 14 years old, without particular ATCD, who presents for 3 months, a heaviness of the lower limbs, aggravated by a walking disorder; difficulty walking and falls. Clinical examination: Patient conscious, afebrile with preservation of general condition, Frankel grade C paraparesis, pyramidal irritation and sphincter disorder type of urinary leakage. Imaging: a spinal cord MRI performed demonstrated an extensive dorsal cystic formation from D7-D10, with a signal identical to that of the

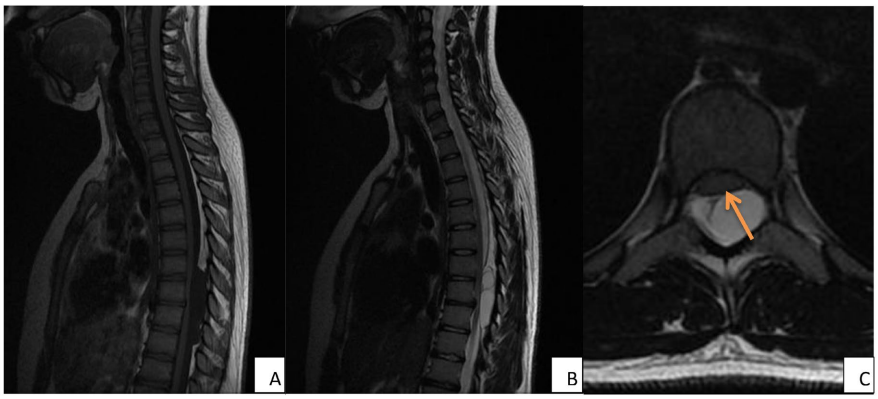

Figure 1. Medullary MRI in sagittal T1-weighted sections in hypointense (A), hyperintense in T2 (B), and axial T2 (C) showing an extensive dorsal posterior cystic formation from D7-D10, with a signal identical to that of the CSF without enhancement after gadolinium injection.

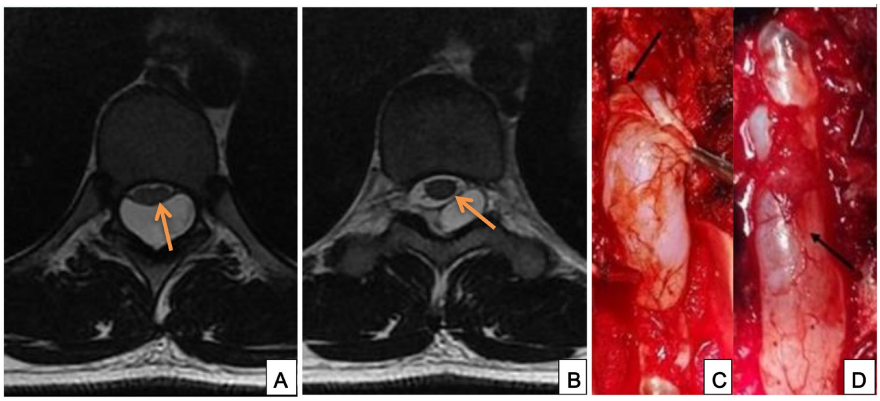

Figure 2. A, B; axial sections in hypersignal in T2. Sections C, D: intraoperative view of the arachnoid cyst after performing a laminectomy; the arachnoid cyst composed of a thin and translucent membrane with a dural opening.

CSF, hypointensity in T1 sagittal section in A, hyperintensity in T2 sagittal section in B and axial section in C (**Figure 1**), not enhancing after gadolinium injection, posteriorly located, pressing the cord against the posterior wall of the vertebral bodies (**Figure 2**; A, B, Arrow). The diagnosis of spinal cord compression was retained. Operated via the posterior approach with a laminectomy and excision of the cyst and closure of the dural opening [**Figure 2**; C, D, Arrow] with good progressive postoperative progress without neurological sequelae.

3. Discussion

The exact origin and pathogenesis of spinal extradural arachnoid cyst (SEDAC) remains unknown. The etiopathogenesis of SEDAC remains hypothetical [3]. SEDAC probably has a congenital origin. It is the result of congenital dural diverticulum or arachnoid herniation through congenital dural aplasia. The junction of the root and dural sheath are the most common sites of these defects. The theory of a congenital origin is supported by reports of a familial syndrome, including multiple spinal arachnoid cysts, lymphedema of the lower extremities (Milroy's disease) and distichiasis (double row of eyelashes). The association of spinal arachnoid cysts with arachnoiditis (potential source of arachnoid septations), spinal surgery and spinal cord trauma suggest that these cysts may result from acquired dural lesions. SEDAC generally develops in young adults, usually posterior or posterolateral, with a male predominance. Clinically, SEDAC is often asymptomatic and discovered incidentally. Spinal cord and/or nerve compression has only rarely been described. SEDAC is revealed by progressive paresis of the spastic type, of one or both lower limbs, associated with paresthesias, radicular pain followed by motor deficit. Thus, the clinical picture depends on the level of spinal cord compression with periods of remissions. The evolution of symptoms is shorter than for lumbar cysts due to the difference in the diameter of the spinal canal on the one hand and the vulnerability of the spinal cord compared to the roots of the cauda equina. The key complementary examination is MRI, simple X-ray, scanner and myeloscanner are mentioned in the literature. MRI remains the reference examination for the positive diagnosis of SEDAC given its high sensitivity and specificity for lesions containing CSF [4]. It precisely shows the exact seat, size, extent and single or multiple character of the cyst and the degree of nerve compression and the state of the spinal cord next to the cyst. In addition, he guides the choice of the surgical approach and evaluates the neurological prognosis of the patient. Generally, the SEDAC appears as a mass sitting behind the spinal cord and has the same signal as the CSF, both in T1 and T2 weighted sequences. However, this signal can sometimes be different due to variations in the fluid flow inside the cyst, a communication of the SEDAC with the subarachnoid space. Intravenous injection of Gadolinium is useful in eliminating other cystic lesions that may be confused with spinal epidural arachnoid cyst such as synovial cyst, neural cyst, dermoid or epidermoid cyst, hydatid cyst or also purely cystic tumor such as cystic schwannoma and hemangioblastoma [5]. It is a translucent cyst, of variable

size, whose wall resembles thick arachnoid. The opening is only found in 30% of cases. The treatment of SEDAC aims to restore normal CSF circulation, relieve radiculo-medullary compression and prevent recurrences [6]. The surgery must make it possible to restore the normal flow of the LCR by lifting the compression by the cyst, to take samples for a histological examination allowing to confirm a diagnosis already suspected. Several surgical methods can be proposed, in particular marsupialization of the cyst, which consists of opening the cyst and having its contents communicate widely with the perimedullary subarachnoid spaces, however wide resection of the cyst is the method of choice since it aims to remove definitely the pressure gradient between the cyst and the subarachnoid space [7]. Conservative treatment with monitoring of the evolution of clinical symptoms and regular radiological checks is indicated for asymptomatic patients. Concerning symptomatic SEDAC, the surgical indication is granted. Complete excision of the cyst is then recommended, with ligation of the pedicle communicating the cyst with the subarachnoid space and repair of the dura-merian defect [8]. This is the technique of choice to prevent CSF reaccumulation and cyst recurrence. The prognosis is linked to certain preoperative factors such as advanced age, a long-lasting neurological deficit or myelomalacia on MRI [9]. This may be due to medullary vascular insufficiency caused by chronic compression of the marrow [10].

4. Conclusion

SEDAC is a distinct entity. It can be seen at any age; its pathogenesis can be congenital or acquired. The clinical picture is that of slow spinal cord compression. Spinal MRI confirms the diagnosis. It is therefore the examination of choice which makes it possible to study the spinal content as a whole, to characterize in a specific way the cystic nature of the process and to better appreciate the medullary repercussions. Surgery is the best way to restore the normal flow of CSF by lifting the compression exerted by the cyst on the spinal cord. The prognosis of this histologically benign pathology is generally good.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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