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CASE REPORT

SPINAL ARACHNOID CYST: A CASE REPORT

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ABSTRACT

Arachnoid cysts are categorised into cranial and spinal types and are usually asymptomatic. Spinal arachnoid cysts are rare. In large dimensions, the cyst may require surgery. In this case report, we aim to evaluate a patient with spinal arachnoid cyst and the surgery to remove the cyst. A 70-year-old patient applied to the clinic with the complaint of losing balance while walking. No additional symptoms were found in the examination. Magnetic resonance imaging showed a cystic lesion of 25x21x11 mm size located in the anterior area at the T2 level, suggesting an arachnoid cyst. The patient was operated on, and the cyst was removed. The patient was discharged without complaints. There were no problems during the follow-up period. Spinal arachnoid cysts are uncommon; however, when present, they might cause pathological findings in patients. They are usually found incidentally on radiological imaging performed for another reason. The treatment decision should be made considering the complaints of patient, localisation of cyst, and size of cyst.

Keywords: Arachnoid cysts, excision, spinal cysts

INTRODUCTION

Arachnoid cysts (AC) are cerebrospinal fluid accumulations in the arachnoid membrane. Even though they are mostly intracranial, they can also be observed in the spinal cord (1). In the spinal cord, spinal AC (SAC) are usually seen in the thoracic region (2). The size and location are the main factors in symptom presentation (3). The most common symptoms are headache, dizziness, nausea, vomiting, ataxia, seizures, and hearing loss. In infancy, hydrocephalus is also a common symptom. On the other hand, SAC give symptoms of the pressure they make on the spinal cord. The patient may present to the clinic with lower back pain, numbness, or weakness in the legs. The formation mechanisms are unclear; most of them are thought to be congenital. Congenital ones are called primary AC. Other predicted formation mechanisms are traumas and infections, especially in the first two decades, named secondary AC (4). To our knowledge, the genetic factor should always be considered. Previous literature shows that mutation in the *FOXC2* gene may cause AC (5). It may also have an association with genetic diseases such as Marfan syndrome (6). SAC are rare. Approximately 2% of the spinal cysts are identified as AC. Those are not usually the reason for the patient's presentation to the clinic; they are diagnosed incidentally. Generally, AC are asymptomatic, but various symptoms may be present depending on their location and size (1). AC are seen in a higher prevalence in men; however, it is not possible to give an exact ratio of the frequency in the population due to the probability of many undiagnosed cysts (7). Although magnetic resonance imaging (MRI) is the gold standard for diagnosis, computed tomography (CT) is also sufficient at diagnosis of arachnoid cyst (8, 9). If the patient has no symptoms, AC can be followed up with imaging every six months or a year. Conservative treatment is preferred in most patients. Invasive methods such as endoscopic procedures, open craniotomy fenestration, shunting, and marsupialization are preferred in patients with severe symptoms (1). The aim of this case report is to report an arachnoid cyst that is detected in an

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elderly male patient, which was previously operated with the diagnosis of meningioma.

CASE REPORT

A 70-year-old male patient was admitted to the department of neurosurgery of Trakya University School of Medicine with a complaint of dizziness during walking. Cerebellar condition was tested. Romberg and Fukuda tests were positive, patience balance was disordered. The patient did not have any other complaints. The patient's physical examination was unremarkable. He had no motor weaknesses, sensory loss, or pathological reflexes. Cervical and cranial MRIs were requested since it was known that the patient was previously operated on for meningioma five years ago. In addition to the anticipated postoperative changes in the cranial frontoparietal region, a cystic lesion with hypodense nodularity that may belong to the debris-solid component was observed. It was measured 25 mm in the long axis in the coronal plane and 21x11 mm in the axial plane, located in the anterior epidural area at the T2 vertebra level (Figure 1). An arachnoid cyst was considered a preliminary diagnosis. An operation decision was made, and routine preoperative examinations were completed. The operation was started with a midline incision between T1-T3 spinous processes. Paravertebral muscles and fascia were detached unilaterally, and T2 left hemilaminectomy was performed. After local excision of the ligamentum flavum, and dural opening, a cystic mass was located under it (Figure 2) and removed in two parts (Figure 3). It was observed that compression decreased dramatically after excision. After the meticulous water-tight closing of the dura, a drain was placed in the epidural space, and the surgery was completed. The patient was awakened uneventfully and hospitalized in the neurosurgery department. The postoperative examination was regular; no neurological deficit was detected. A postoperative MRI showed the total removal of the cyst. The patient's condition was stable on the fourth postoperative day, so he was discharged. The follow-up period of three months was uneventful, and the patient's complaints regressed dramatically.

Pathology

The cyst was excised in two pieces and sent to the pathology department for macroscopic and microscopic examination. An off-white lesion measuring 2.5x0.5 cm was formed as the pieces were combined. Histopathologically, the epithelium of AC was lined with a single layer of mature arachnoid (Figure 4). Rarely, meningothelial hyperplasia could be seen in focal foci (Figure 5). A fibrous membrane and sparse structure could be observed. The immunohistochemical study showed a reaction in the arachnoid event with epithelial membrane antigen (Figure 6).

DISCUSSION

Spinal arachnoid cysts are rare benign structures; the formation mechanism has not yet been determined. It is known that SACs are usually located extradural, as reported by Yaltırık et al. (10). Although the exact mechanism of formation is not known,

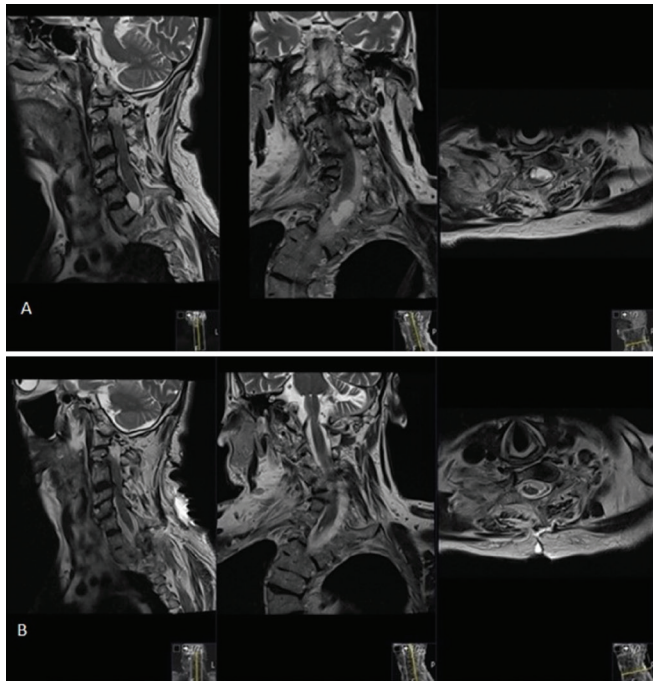

Figure 1: A: Preoperative magnetic resonance imaging in the sagittal, coronal, and axial plane, **B:** Postoperative magnetic resonance imaging in the sagittal, coronal, and axial plane.

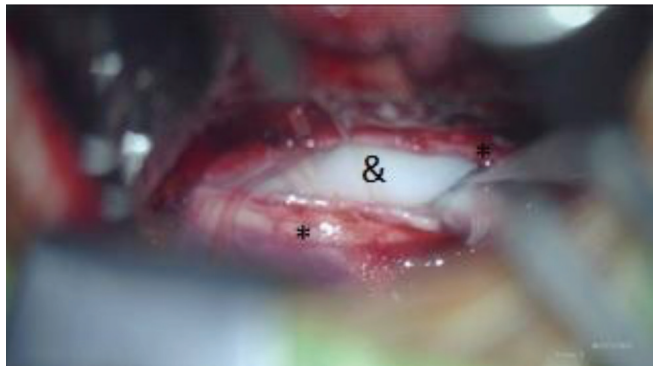

Figure 2: After dural incision a cystic mass was located. The dura mater (asterisk). The cyst (&).

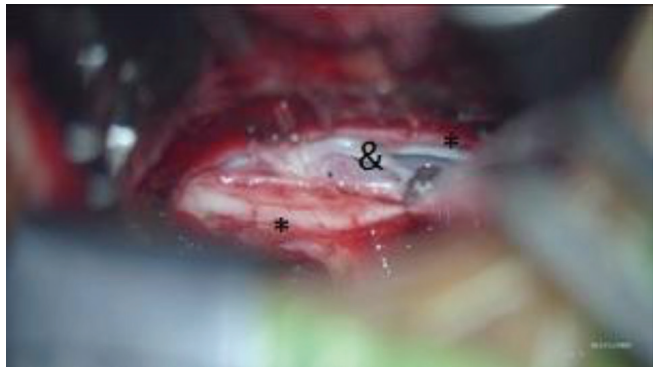

Figure 3: The cystic mass was excited in two parts. The dura mater (asterisks). The cyst (&).

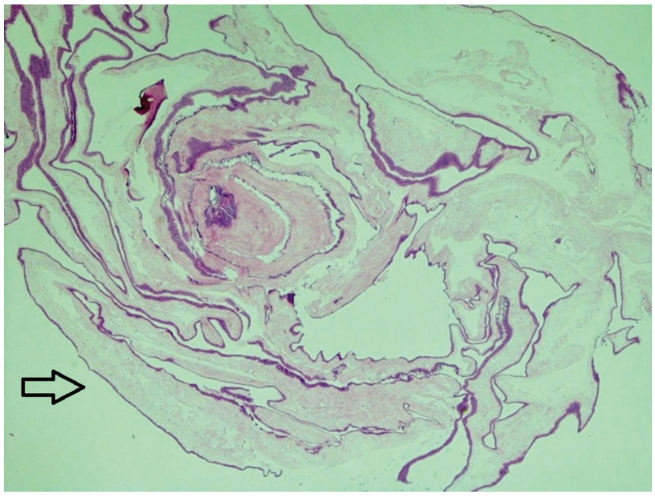

Figure 4: Cystic formation with an epithelial and fibrous membrane consisting of a single row of arachnoid cells (arrow) (hematoxylin and eosin, x40 magnification).

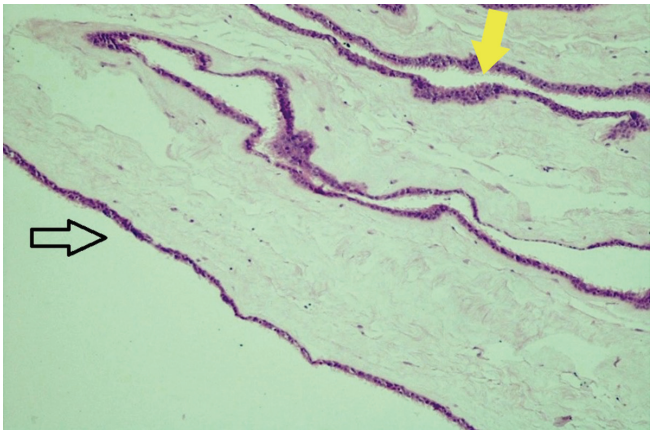

Figure 5: The cyst epithelium was lined with a single row of arachnoid cells (black arrow). Meningothelial hyperplasia may be seen in focal areas (yellow arrow) (hematoxylin and eosin, x200 magnification).

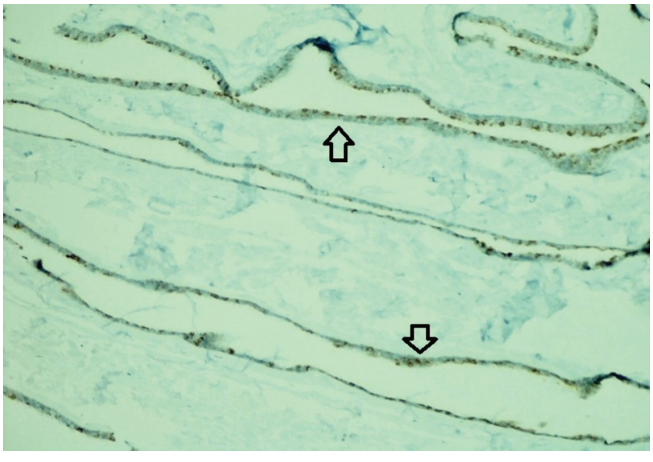

Figure 6: Arachnoid cells showing epithelial membrane antigen immunoreactivity (arrows) (epithelial membrane antigen immunohistochemistry, x200 magnification).

previous trauma and infection are considered important risk factors. Our patient reported neither of them. However, he had a history of a recent cranial operation. The absence of any lesion in the patient's previous imaging suggests that the cyst formed after the operation. This condition is rare because ACs are usually congenital and diagnosed in the first two decades. There are publications in the literature about ACs related to several diseases. Dandy-Walker syndrome is reported to be one of them (11). One study reported that some SAC patients had headaches that started with exercise (6). Therefore, it would be reasonable to request an MRI in patients presenting with a similar anamnesis, keeping the diagnosis of AC in mind. In almost all studies on AC, MRI and CT have been used together for accurate diagnosis and treatment (8). CT may be the first step to have a suspicion of an AC; however, final diagnosis must be proved by MRI (8). In our case, we also decided to investigate with dual imaging. Patients with SACs may be followed up by MRI and CT if patients do not have neurological symptoms or increased intracranial pressure. The aim of treatment in AC is to provide a connection between the content of the cyst and the anatomical corridors of cerebrospinal fluid flow or to place a shunt system between the cyst and other body cavities where resorption can be achieved. The location of the cyst is important in determining the surgical treatment method of AC. The indication for endoscopy should also be reviewed for each patient. The age of the patient, anatomical features of the cyst, the relationship of the cyst with the surrounding cisterna and vascular structures are the factors affecting the use of the endoscope. In line with the detailed information provided by the constructive interference in steady state sequence, it is possible to make realistic plans regarding especially endoscopic surgical techniques, possible cysto-cisternostomy and cysto-ventriculostomy options (12). SAC are rare benign formations that might require treatment when they lead to neurological symptoms. Complete excision and, if possible, dural repair should be performed when surgery is required, but follow-up is usually sufficient. The decision should be made by considering the patient's clinical, radiological, and demographic characteristics, and by including the patient and their relatives in the decision process.

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REFERENCES

1. Mustansir F, Bashir S, Darbar A. Management of arachnoid cysts: a comprehensive review. Cureus 2018;10(4):e2458. [Crossref]
2. Singh S, Bhaisora KS, Sardhara J et al. Symptomatic extradural spinal arachnoid cyst: more than a simple herniated sac. J Craniovertebr Junction Spine 2019;10(1):64-71. [Crossref]

3. Cho HY, Lee SH, Kim ES et al. Symptomatic large spinal extradural arachnoid cyst: a case report. Korean J Spine 2015;12(3):217-20. [Crossref]
4. National Organization for Rare Disorders. Arachnoid cysts (cited 2022). Available from: URL: https://rarediseases.org/rare-diseases/arachnoid-cysts/. [Crossref]
5. Ogura Y, Fujibayashi S, Iida A et al. A novel FOXC2 mutation in spinal extradural arachnoid cyst. Hum Genome Var 2015;2:15032. [Crossref]
6. Arenaza Basterrechea N, Macarrón Vicente JL, Aícua Rapún I et al. Spinal arachnoid cysts as an unusual cause of exercise headache. Neurologia 2016;31(8):579-80. [Crossref]
7. Al-Holou WN, Terman S, Kilburg C et al. Prevalence and natural history of arachnoid cysts in adults. J Neurosurg 2013;118(2):222-31. [Crossref]
8. Kayhan S, Doğan A. Different surgical options for the management of intracranial arachnoid cysts. Research Square 2022 March 15. doi: 10.21203/rs.3.rs-1210965/v1. [Epub ahead of print] [Crossref]
9. Kojimahara Y, Tsuge S, Hasegawa K et al. A case of a spinal extradural arachnoid cyst. Case Rep Orthop 2019;2019:3516598. [Crossref]
10. Yaltırık CK, Yücelı Ş. Spinal arachonid cysts. J Turk Spinal Surg 2019;30(3):207-10. [Crossref]
11. Jurcă MC, Kozma K, Petcheşi CD et al. Anatomic variants in Dandy-Walker complex. Rom J Morphol Embryol 2017;58(3):1051-5. [Crossref]
12. Kemerdere R, Kafadar AM, Erdinçler P. Treatment options of arachnoid cysts. Türk Nöroşirürji Dergisi 2013;23(2):220-5. [Crossref]