

## Surgical Treatment of Post-Traumatic Symptomatic Thoracolumbar Intradural Spinal Arachnoid Cyst

### Post-travmatik Torakolomber Intradural Araknoid Kistin Cerrahi Tedavisi

Oguz Kagan Demirtas, Aydemir Kale, Hakan Emmez

Department of Neurosurgery, Gazi University Faculty of Medicine, Ankara, Turkey

#### ABSTRACT

Spinal arachnoid cysts are oftenly caused by trauma, infection or inflammation. Most of these cysts are been detected incidentally while rutine controls. They are generally benign and do not cause any complaints. Here we present a 34-year-old patient who had undergone spinal instrumentation for 4 years ago due to vehicle accident. He had no complaints up to 6 months. Progressive incontinence, premature ejaculation and nubness/weakness on right leg were developed recently. Radiological examinations showed intardural spinal arachnoid cyst compressing spinal cord. After successful surgical resection, the patient's complaints regressed. Although conservative treatment is preferred for asymptomatic spinal arachnoid cysts, surgical decompression should be performed for sypmtomatic cases.

**Keywords:** Spinal arachnoid cyst, surgical resection, intradural cysts, trauma

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#### ÖZET

Spinal araknoid kistler sıklıkla travma, enfeksiyon veya inflamasyona sekonder gelişir. Bunların pek çoğu rutin kontroller sırasında insidental olarak saptanır. Genellikle benign karakterlidir ve şikayete sebep olmazlar. Bu olguda 4 sene önce bir trafik kazası sonrası spinal enstrümantasyon cerrahisi geçiren 34 yaşındaki bir hasta takdim edilmiştir. 6 ay öncesine kadar şikayeti olmayan hastada, yeni başlayan progresif inkontinans, prematür ejakülasyon ve sağ bacakta güçsüzlük/uyuşma şikayetleri meydana gelmiştir. Yapılan radyolojik incelemelerde spinal kordu komprese eden araknoid kist saptanmıştır. Başarılı bir cerrahi dekompresyon sonrası, hastanın şikayetleri regrese olmuştur. Asemptomatik vakalarda genellikle konservatif tedavi tercih edilirken, semptomatik ve nörolojik bulgu veren vakalarda dekompresyon tercih edilmelidir.

**Anahtar Sözcükler:** Spinal araknoid kist, cerrahi rezeksiyon, intradural kistler, travma

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**ORCID IDs:** O.K.D.0000-0002-3913-5899,A.K.0000-0002-2268-6408,H.E.0000-0002-3290-179X

**Address for Correspondence / Yazışma Adresi:**Aydemir Kale MD A/Prof, Department of Neurosurgery, Gazi University Faculty of Medicine, Beşevler, 06500 Ankara, Turkey  
E-mail: aydemirkale@gmail.com

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## INTRODUCTION

Thoracic cord compression is usually caused by malignant diseases, but more rarely in cystic diseases such as arachnoid cysts. Arachnoid cysts are idiopathic, congenital and acquired cysts. The causes of acquired cysts include trauma, iatrogenic, inflammation and infection (3). Although arachnoid cysts are usually asymptomatic, they rarely cause complaints and serious neurological deficits. The presenting symptoms may include pain, paresthesia, neurogenic claudication, bladder or bowel dysfunction, and variable degrees of spastic weakness (1). In this article, we present a case of symptomatic arachnoid cyst that developed after post-traumatic 4 years and showed significant improvement after surgical resection.

## CASE REPORT

### History and examination

A 34 year old male patient underwent thoracolumbar instrumentation surgery (T11,T12,L1,L2) 4 years ago after a vehicle accident. He suffered dural injury after his first accident. Paresis developed in his right leg after the accident. All complaints and deficits of the patient improved in the 3rd month after surgery. Six months ago, urge incontinence, premature ejaculation and right leg loss of power again started. The patient had no defecation problem and had difficulty in micturition. In his neurological examination, motor strength of his right leg was 4/5 and right L2,3,4 hypoesthesia.

On magnetic resonance images (MRI), the cord was compressed from the posterior at T12-L1 level (Figure 1). There was no definite distinction as to whether the compression lesion was a space-occupying mass or cyst. Because of neurological deficits and suspicious pressure on MRI images, surgical exploration was decided in neurosurgery-radiology council.

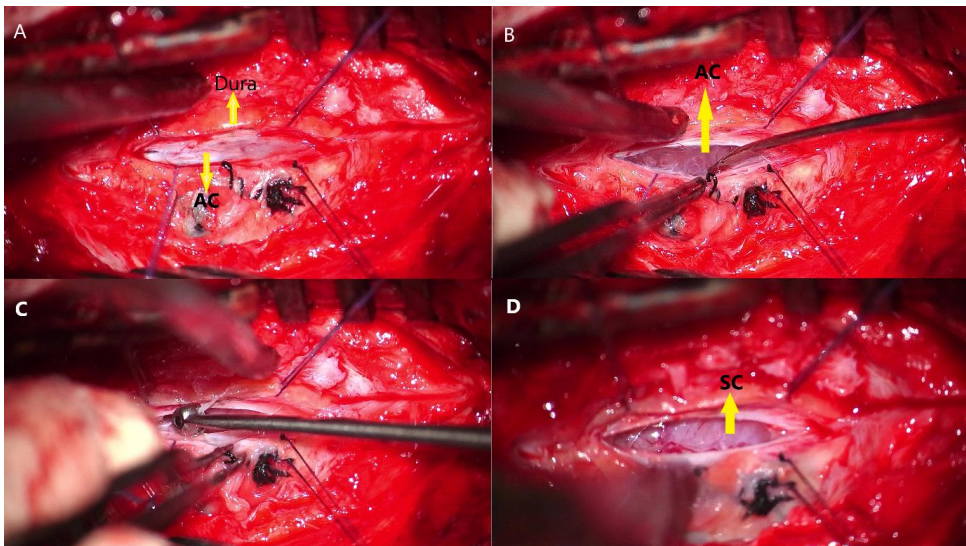


**Figure 1:** Pre-operative radiological examinations. (A) Plain radiography shows us instruments level of the T11-T12-L1-L2. (B) Sagittal and (C) axial T2 weighted MRI shows spinal cord compression. T12-L1 level is where compression is maximal.

### Operation

A single dose cefazoline antibiotic prophylaxis was given before the surgery. After general anesthesia procedure and intubation, patient turned prone position. The surgical field was cleaned with iodine and the patient was covered sterile. The old incision was re-opened with scalpel. After we reached dorsolomber fascia, descending from the middle line with the help of cautery. Paravertebral muscles were excluded by cerebellar retractors. Two intermediate connections between T11-T12 and L1-L2 were stripped with cauterization.

From this stage, using a surgical microscope (OPMI Pentero Carl Zeiss), the granulated tissues on total laminectomy area between the two interconnections were slowly excised with the help of scalpel to expose the dura. We saw the old sutures on the dura, due to dura was injured car accident. Dura was opened by scalpel and retracted with many of microsuture. Cystic lesion was detected and dissected from the other surrounding tissue (Figure 2). While we were dissecting, the cyst ruptured and evacuated very high pressure cerebrospinal fluid (CSF) through it.



**Figure 2:** Intra-operative surgical microscope recording. (A), opening the dura and sight of arachnoid cyst (AC). (B) dissecting the cyst from surrounding tissue with dissector. (C) Cyst wall was removed with biopsy forceps. (D) After total resection of cyst wall, sight of the spinal cord (SC). Spinal cord has been under pressure and was under impressio effect.

Cyst walls and spinal cord were seen more clearly after CSF discharge. Cyst contents were sampled for cytological examination. The cyst wall was cut into small pieces with biopsy forceps and sent to pathology. After the excision of the cyst, an impressio due to chronic compression was seen in the spinal cord. Excision of the cyst revealed CSF passage opening.

After irrigation intratechal area with normal saline and hemostasis, we closed the dura by running suture with 6/0 prolene. We placed a hemovac drain after dural closure and then wound was sutured in layers over. Operation was performed successfully by neurosurgery chief resident under supervision of responsible professor.

#### *Postoperative Course*

The postoperative course was uneventful. The patient was taken to the inpatient service after the operation without any complications. No new neurological deficit was observed postoperatively. On the first postoperative day, the patient was mobilized and removed his drain after the absence of blood or CSF. The patient told us his complaint such as urge incontinence and right leg weakness was significantly improved. His right leg motor examination was -5/5 post-operatively. Patient was discharged postoperative 4<sup>th</sup> day due to absence of new complaint or wound problems. Two weeks later, the patient came to the outpatient clinic with his pathology report. The pathology report was consistent with the arachnoid cyst and no malignant cells were observed in the aspiration fluid. The patient reported that almost all of his complaints in the preoperative period disappeared.

#### **DISCUSSION**

The pathogenesis of spinal arachnoid cysts is unclear, although congenital, traumatic and inflammatory causes have been postulated. They can be extra- and intra-axial or intramedullary lesions and are maybe communicating or noncommunicating with the CSF space (5). Traumatic spinal arachnoid cysts are formed as a result of CSF trapped by check-valve system due to adhesion in arachnoid membrane due to trauma, hemorrhage (3). CSF filling this region or fluid secretion from the cyst wall cell themselves causes dilatation in time and cyst formation occurs.

Congenital cases are usually asymptomatic and incidentally detected, whereas those acquired cysts tend to be symptomatic (6). In the long term, these lesions cause myelopathy and some neurological deficits in the cord (4). MRI is the most useful non-invasive radiologic technique to determine spinal arachnoid cysts. Relationship between the lesion and the spinal cord and differential diagnosis could be shown with MRI.

Although numerous surgical treatment methods have been proposed, the results of surgery were variable (1). There are modalities such as surgical resection, adhesion opening and ventriculoperitoneal shunt. In asymptomatic limited cases, conservative radiological follow-up may be recommended (2).

Total removal of the cyst is important for recurrence especially in traumatic or iatrogenic cysts. In the case of residual cysts left behind, surgical intervention causes more adhesion and causes recurrence. We chose surgical resection in the treatment because of presence of neurological deficits and we think other neoplastic lesion in the differential diagnosis.

The success of surgical intervention is unpredictable in these cases. The location and size of cyst, etiology, preoperative neurological status affect the success of surgical resection. Because of the posterior localization of the arachnoid cyst, total removal, opening of the CSF passage and the patient's neurological deficits was not advanced stage, our surgery was successful.

#### **CONCLUSION**

Intradural cysts should be considered in the differential diagnosis of lesions causing myelopathy and/or a radicular pain syndrome. Although intradural spinal arachnoid cysts are rare lesions, they rarely cause serious neurological deficits. Surgical resection is the gold standard in the treatment of patients with progressive neurological deficit.

Patient Consent- The patient has consented to the submission of the case report for submission to the journal.

#### **Conflict of interest**

No conflict of interest was declared by the authors.

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