

# An Arachnoid Cyst Complicated by Spontaneous Intracystic Hemorrhage: A Case Report

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✓ Arachnoid cysts are developmental anomalies which are usually asymptomatic. There are various opinions regarding the etiological factors. Intracystic hemorrhage after trauma is a well known complication of arachnoid cysts; however, spontaneous intracystic hemorrhage is rare. The presented case was admitted to our clinic following transient loss of consciousness and dysphasia, and a hematoma having the characteristics of a subacute subdural hematoma at the left temporal region was diagnosed. However, the hematoma was found to be an intracystic one during surgical intervention. This report presents a rare case of an arachnoid cyst complicated by spontaneous intracystic hemorrhage, demonstrating radiological and clinical features of the case.

**Key words:** Arachnoid cyst, intracystic hematoma, subdural hematoma

## Araknoid Kist İçine Spontan Kanama: Olgu Sunumu

✓ Araknoid kistler genellikle asemptomatik kalan gelişimsel anomalilerdir. Etyolojileri hakkında çeşitli fikirler ileri sürülmüştür. Kist içine kanama araknoid kistlerin iyi bilinen bir komplikasyonudur, ancak spontan intrakistik kanama nadirdir. Sunulan olgu geçici şuur kaybı ve disfazi ile başvurdu ve sol temporal bölgede subakut subdural hematoma tanısı ile yatırıldı. Ameliyatta hematomanın intrakistik olduğu anlaşıldı. Bu çalışmada intrakistik kanama ile komplike olan nadir bir araknoid kist olgusu sunulmakta ve olgunun radyolojik ve klinik özellikleri sunulmaktadır.

**Anahtar kelimeler:** Araknoid kist, kist içine kanama, subdural hematoma

Arachnoid cysts are believed to be congenital fluid-filled cavities circumscribed by arachnoidal membrane that have settled in the cisternae and major cerebral fissures. It is estimated that 1 % of non-traumatic intracranial mass lesions are arachnoid cysts (19). Intracystic fluid resembles cerebrospinal fluid (CSF). A sylvian cisterna in the middle cranial fossa is the most common site for arachnoid cyst development (13). They are usually asymptomatic and diagnosed incidentally on cranial radiological work-up for other reasons or post mortem studies (10). When symptomatic, they usually present with symptoms of increased intracerebral pressure, such as headache and nausea.

On the other hand, symptomatic children may present with abnormal head shape, seizure and focal neurological impairment. There are reported arachnoid cyst cases in the literature presenting with subdural, intracystic, or rarely extradural hematoma after trauma (1-5,8-10-13,18,19). This report presents radiological and clinical features of a patient with an arachnoid cyst, complicated by spontaneous intracystic hemorrhage.

## CASE REPORT

A fifty-seven-year-old male patient suffering from headache, impaired speech and fainting was admitted. His medical and family histories

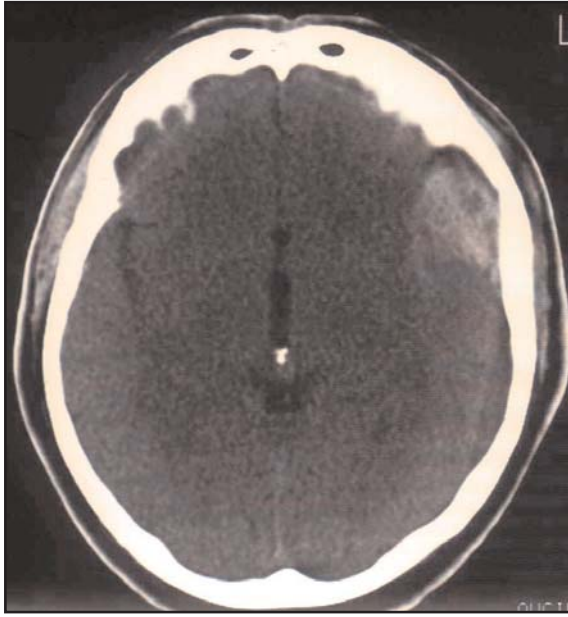


Figure 1. The hematoma was hyperdense in computerized cranial tomography.

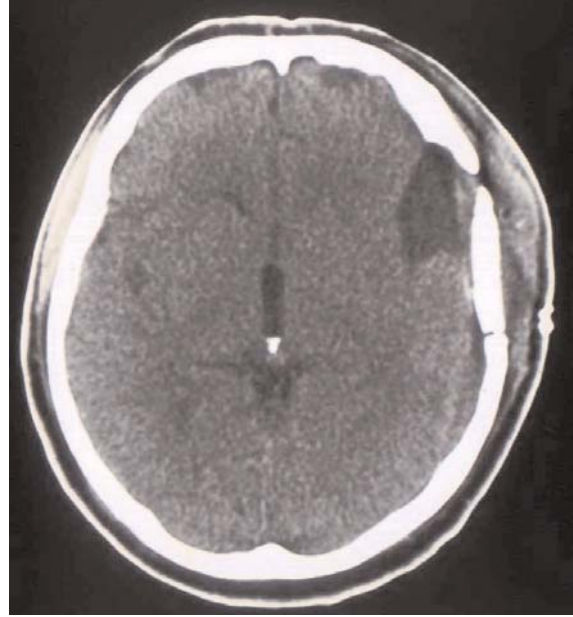


Figure 3. Early post-operative cranial tomography (at the end of the first week) demonstrating persistence of the arachnoid cyst.

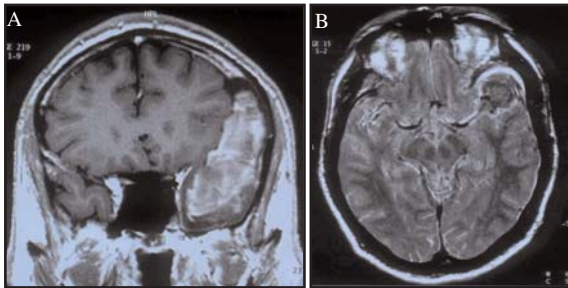


Figure 2. MR images of the hematoma. A- Hyperintense in T1-weighted images, while centrally hypointense, B- peripherally hyperintense on T2-weighted images.



Figure 4. MR image performed one year after the surgical intervention demonstrating persistence of the arachnoid cyst.

were unremarkable. The neurological examination was normal, except for his motor dysphasia. The computerized cranial tomography revealed a left temporal hyperdense lesion (Figure 1). Magnetic resonance imaging demonstrated a lesion of 5x4x3 cm, which was iso-hyperintense on T1-weighted images. The central part of the lesion was hypointense on T2-weighted images, while the surrounding was hyperintense (Figure 2). Laboratory analyses revealed normal results and there were no signs of a coagulopathy. A left temporal craniotomy was performed. Upon opening of the dura, the hematoma was turned out to be under the arachnoidal membrane. We opened the membrane and evacuated the hema-

toma. Additionally, we excised the arachnoid membrane. The surgical scene was concordant with an arachnoid cyst, complicated by an intracystic hematoma. The patient's clinical condition improved quickly after surgery. Early postoperative radiological imaging demonstrated the arachnoid cyst (Figure 3). He was dischar-

ged on the 3rd post-operative day in good condition. The follow-up cranial MRI performed a year after the operation demonstrated the left temporal arachnoid cyst (Figure 4).

## DISCUSSION

Arachnoid cysts are congenital malformations resulting from CSF accumulation in between the laminae of the arachnoid membrane (4-6). They are usually found in the Sylvian fissure; however, parasellar region, cerebral convexity, inter-hemispheric fissure, quadrigeminal plate, cerebellopontine angle, vermian and retroclival area are also parts of the brain where arachnoid cysts can be found (13).

Galassi has divided arachnoid cysts into three groups according to their size and relation with the Sylvian fissure: Type 1: Small and biconcave; they are found in the anterior temporal pole. Enhanced CT cisternography usually reveals their connection with the subarachnoid space. Type 2: These are found in the middle and proximal parts of the sylvian cisterna. The insula is uncovered. Type 3: These cover the entire Sylvian fissure, leading to midline shift. They have minimal connection with the subarachnoid space (7).

Arachnoidal differentiation is completed at the 15th week of the gestation. Arachnoid cysts may be the result of tears in the arachnoid during the formation of the subarachnoid cisternae resulting from the changes in the CSF flow, or, they can be the result of entrapment of the CSF in a diverticulum (13). Another hypothesis asserts that arachnoid cysts are formed during the separation of the arachnoid membrane from the dura mater. Trauma is another factor suspected to be the underlying pathogenesis of arachnoid cysts (13). According to Naidich et al., arachnoid cysts are the result of pulsation of the CSF and the changes in the developing central nervous system, arachnoid and the pia (15).

The wall of the arachnoid cyst is covered with arachnoid membrane and includes lamellar and collagen connections. The membrane can contain veins and capillaries and the ependyma can have cuboidal epithelia. In most of the cases, the arachnoid duplicates itself at the borders of the cyst wall. They are usually formed of static fluid compartments; however some can grow in time. These can have remnants of the choroid plexus, arachnoid granulations or the subdural neuroepithelium, leading to active CSF secretion (13).

Arachnoid cysts demonstrate non-enhancing, well circumscribed, non-calcified, and extra-parenchymal cystic mass lesions on CT or MRI (11). These techniques are also useful in cases of arachnoid cysts complicated by hemorrhage. Gradual density of the hemorrhage demonstrated in CT investigations is the sign of chronicity of the hemorrhage. In the hyperacute stage T1-weighted MR images reveal hypointensity, while T2-weighted images demonstrate hyperintensity. In the acute stage, T1-weighted MR images demonstrate iso- or minimal hypo-intensity, whereas T2-weighted images demonstrate hyperintensity. In the subacute stage, both sequences demonstrate hyperintense lesions, and in the chronic stage, the peripheral part of the lesion is hypointense, while the central part is hyperintense. Hypointensity advances to the peripheral part of the lesion in time (9-11). In our case, the T1-weighted slices demonstrated hyperintensity, while T2-weighted images demonstrated central hypointensity and peripheral hyperintensity. This was concordant with late phase acute intracystic hemorrhage.

Arachnoid cyst complicated by subdural or intracystic hemorrhage is a rare entity. Robinson and Smith have reported that 2.43 % of the arachnoid cysts in the middle cranial fossa can present with subdural hematoma or hygroma (18,19). These cases are usually diagnosed after neurological impairment following moderate

head injury. Kawanishi, İldan, Boviatsis, De and Ergüner et al. have reported cases of arachnoid cysts presenting with intracranial hematoma (2-4,12-14,19). The lower compliance of the cyst tissue compared to the normal brain or tears in the bridging veins may be the underlying factors (5,17,20-22). Our case is unique with the absence of history of previous head trauma history. Spontaneous intracystic hemorrhages are extremely rare. There are four different reports of arachnoid cysts complicated by spontaneous intracystic hemorrhage in the literature (8-11,16-21). This report presents a rare case of an arachnoid cyst complicated by spontaneous intracystic hemorrhage, demonstrating radiological and clinical features of the case.

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