

Case Report

Joo-Chul Hong, M.D.

Min-Soo Kim, M.D.

Chul-Hoon Chang, M.D.

Seong-Ho Kim, M.D.

Department of Neurosurgery
College of Medicine
Yeungnam University
Daegu, Korea

Arachnoid Cyst with Spontaneous Intracystic Hemorrhage and Chronic Subdural Hematoma

We report a case of a patient with an arachnoid cyst in which subdural hematoma and intracystic hemorrhage developed spontaneously. Usually, arachnoid cysts are asymptomatic, but can become symptomatic because of cyst enlargement or hemorrhage, often after mild head trauma. Although they are sometimes combined with subdural hematoma, intracystic hemorrhage has rarely been observed. Our patient had a simultaneous subdural hematoma and intracystic hemorrhage without evidence of head trauma.

KEY WORDS : Arachnoid cyst · Spontaneous intracystic hemorrhage · Subdural hematoma.

INTRODUCTION

Chronic subdural hematoma (SDH) has generally been believed to occur in elderly people several weeks after a head injury⁸⁾. Arachnoid cysts are also recognized as cause of chronic SDH after head injury in young people and are considered a risk factor for chronic SDH in such population⁹⁾. Nevertheless, arachnoid cysts with chronic SDH in the absence of head trauma are rare^{3,6)}, and intracystic hemorrhage associated with chronic SDH is even rarer.

The authors report a case of arachnoid cyst in which chronic subdural hematoma combined with intracystic hemorrhage developed spontaneously.

CASE REPORT

An 11-year-old girl with headache was admitted via the emergency room. She complained of nausea and vomiting for three days. There had been no history of head trauma or external wound in recent years. A computed tomography (CT) scan showed a hypodense mass in the left fronto-temporal region (Fig. 1), suggesting that there was no acute hemorrhage due to head trauma. Magnetic resonance (MR) examination showed a chronic left cerebral subdural hematoma and an intracystic hematoma in the left middle cranial fossa, in addition to a midline shift to right side (Fig. 2). Because of the headache, nausea, and vomiting, craniotomy and fenestration of the cyst wall were performed. During surgery, the chronic SDH was seen to be separated from the hematoma within the arachnoid cyst by the membrane of the arachnoid cyst and the capsule of the chronic SDH. Intracystic blood clots were removed and the membrane was widely fenestrated (Fig. 3). A postoperative CT scan showed the absence of the subdural hematoma and intracystic hematoma (Fig. 4). The symptoms were relieved without neurologic deficits.

DISCUSSION

Arachnoid cysts are extracerebral, intra-arachnoidal cerebrospinal fluid collections that comprise 1% of all non-traumatic intracranial mass lesions¹²⁾. They

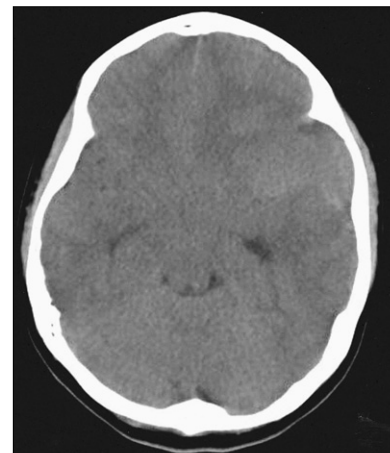


Fig. 1. Computed tomography scan reveals that there is iso-dense mass in left fronto-temporal region.

• Received : November 5, 2007
• Accepted : January 2, 2008
• Address for reprints :
Seong-Ho Kim, M.D.
Department of Neurosurgery
College of Medicine
Yeungnam University
317-1 Daemyeong-dong
Nam-gu, Daegu 705-717, Korea
Tel : +82-53-620-3790
Fax : +82-53-620-3770
E-mail : shkim@med.yu.ac.kr

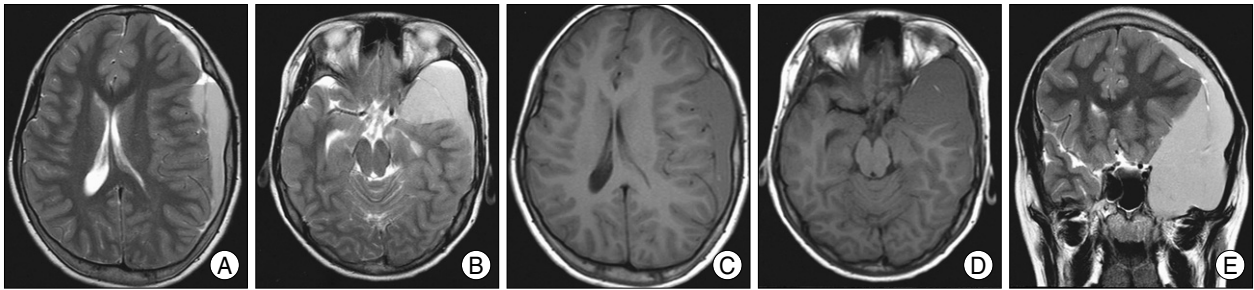


Fig. 2. Magnetic resonance examination shows left chronic subdural hematoma and intracystic hematoma including left middle cranial fossa, midline shift to right side.

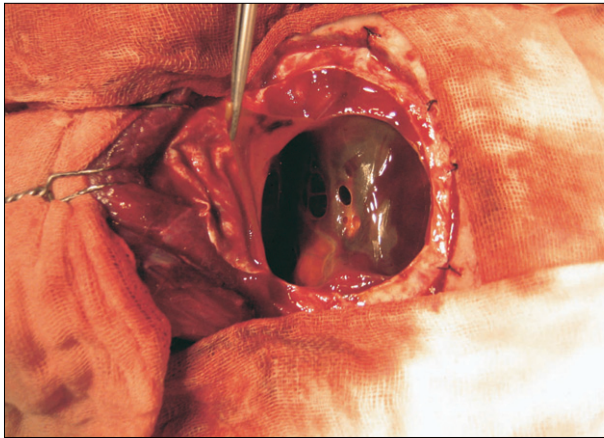


Fig. 3. During operation, intracystic blood clots are removed, and arachnoid cyst membrane and capsule of chronic subdural hematoma are observed in subdural space.



Fig. 4. A postoperative computed tomography scan shows the absence of subdural hematoma and a catheter is seen in intracystic space. There is no remained intracystic bleeding and mass effect.

are generally considered to be congenital and tend to occur in children^{14,17}. They are found in the middle cranial fossa in 50% of cases, with a slight predilection for the left side, and occur slightly more often in boys¹². Computed tomography and MR imaging have increased the detection of incidental asymptomatic arachnoid cysts^{2,4,15}.

However, very rarely, they can become symptomatic because of cyst enlargement or hemorrhages, such as intracystic or chronic SDH, often after head trauma⁶.

The first description of an arachnoid cyst with intracystic bleeding or SDH was reported by Davidoff and Dyke in 1938¹². Arachnoid cysts are occasionally associated with

subdural effusion, which is generally thought to result from tearing of the outer wall of the arachnoid cyst after head injury¹. The rupture of an arachnoid cyst can even occur spontaneously¹³. Tearing of the outer wall of the arachnoid cyst is associated with subdural and/or intracystic hemorrhage caused by rupture of bridging veins, unsupported blood vessels around the cyst wall, and leptomeningeal vessels in the base of the cyst⁴. The arachnoid cyst may enlarge over time as a result of the production of fluid from the cyst walls. The ensuing increased pressure may rupture into the subdural, extradural, or intracystic space and manifest as a hematoma if there is also an accompanying vascular disruption⁵. On radiological examinations, an intracystic hemorrhage may mask the presence of an arachnoid cyst^{7,11}. In some cases it is difficult to distinguish an arachnoid cyst from a sub-acute or chronic intracystic or SDH.

Iaconetta et al.⁶ reviewed the literature that reported the very rare combination of intracystic bleeding with contralateral or bilateral subdural or extradural hematoma. Only 37 such cases have been documented to date in the pertinent literature. In 21 cases (56.7%), as in ours, there was ipsilateral subdural hematoma. Also, fourteen patients had a history of a previous head injury, whereas others did not.

The most successful and comprehensive treatment for a patient with an arachnoid cyst and intracystic and/or SDH is surgery. Membranectomy and cyst communication to the basal cisterns must be performed^{4,11,16}. In our case, we performed craniotomy and confirmed the presence of the SDH and evacuated it. When the arachnoid cyst membrane was revealed, we fenestrated the cyst wall and widely resected the membrane to prevent recurrence. The biopsy of the membrane tissue confirmed the definitive diagnosis of a cyst of arachnoid origin. The patient was relieved of all symptoms and has no neurologic deficit. Postoperatively, a residual cyst can be expected¹⁶. The postoperative prognosis for this patient is good because, following radical treatment, recurrence of the cyst is unusual^{6,10}.

It is very rare for an arachnoid cyst spontaneously to develop intracystic bleeding and subdural hematoma. Although

elderly patients may provide an inaccurate history because they can be confused or intoxicated, the patient in our case was young and could remember clearly that she had no history or evidence of head injury. Therefore, we conclude that the occurrence of intracystic bleeding and subdural hematoma in this patient was, indeed, spontaneous.

CONCLUSION

We report a rare case of the arachnoid cyst spontaneously to develop intracystic bleeding and subdural hematoma. The operation is helpful and successful treatment for the symptomatic patients with an arachnoid cyst combined with intracystic and subdural hemorrhage.

References

1. Albuquerque FC, Giannotta SL : Arachnoid cyst rupture producing subdural hygroma and intracranial hypertension : case reports. *Neurosurgery* 41 : 951-955; discussion 955-956, 1997
2. Arai H, Sato K, Wachi A, Okuda O, Takeda N : Arachnoid cysts of the middle cranial fossa : experience with 77 patients who were treated with cystoperitoneal shunting. *Neurosurgery* 39 : 1108-1112; discussion 1112-1103, 1996
3. Eustace S, Toland J, Stack J : CT and MRI of arachnoid cyst with complicating intracystic and subdural haemorrhage. *J Comput Assist Tomogr* 16 : 995-997, 1992
4. Galassi E, Piazza G, Gaist G, Frank F : Arachnoid cysts of the middle cranial fossa : a clinical and radiological study of 25 cases treated surgically. *Surg Neurol* 14 : 211-219, 1980
5. Huang D, Abe T, Kojima K, Tanaka N, Wataube M, Ohkura A, et al : Intracystic hemorrhage of the middle fossa arachnoid cyst and subdural hematoma caused by ruptured middle cerebral artery aneurysm. *AJNR Am J Neuroradiol* 20 : 1284-1286, 1999
6. Iaconetta G, Esposito M, Maiuri F, Cappabianca P : Arachnoid cyst with intracystic haemorrhage and subdural haematoma : case report and literature review. *Neurol Sci* 26 : 451-455, 2006
7. LaCour F, Trevor R, Carey M : Arachnoid cyst and associated subdural hematoma. Observations on conventional roentgenographic and computerized tomographic diagnosis. *Arch Neurol* 35 : 84-89, 1978
8. Markwalder TM : Chronic subdural hematomas: a review. *J Neurosurg* 54 : 637-645, 1981
9. Mori K, Yamamoto T, Horinaka N, Maeda M : Arachnoid cyst is a risk factor for chronic subdural hematoma in juveniles : twelve cases of chronic subdural hematoma associated with arachnoid cyst. *J Neurotrauma* 19 : 1017-1027, 2002
10. Olsen NK, Madsen HH : Arachnoid cyst with complicating intracystic and subdural haemorrhage. *Rontgenblatter* 43 : 166-168, 1990
11. Page AC, Mohan D, Paxton RM : Arachnoid cysts of the middle fossa predispose to subdural haematoma formation fact or fiction? *Acta Neurochir Suppl (Wien)* 42 : 210-215, 1988
12. Parsch CS, Krauss J, Hofmann E, Meixensberger J, Roosen K : Arachnoid cysts associated with subdural hematomas and hygromas : analysis of 16 cases, long-term follow-up, and review of the literature. *Neurosurgery* 40 : 483-490, 1997
13. Rakier A, Feinsod M : Gradual resolution of an arachnoid cyst after spontaneous rupture into the subdural space. Case report. *J Neurosurg* 83 : 1085-1086, 1995
14. Rengachary SS, Watanabe I, Brackett CE : Pathogenesis of intracranial arachnoid cysts. *Surg Neurol* 9 : 139-144, 1978
15. Sato K, Shimoji T, Yaguchi K, Sumie H, Kuru Y, Ishii S : Middle fossa arachnoid cyst : clinical, neuroradiological, and surgical features. *Childs Brain* 10 : 301-316, 1983
16. van der Meche FG, Braakman R : Arachnoid cysts in the middle cranial fossa : cause and treatment of progressive and non-progressive symptoms. *J Neurol Neurosurg Psychiatry* 46 : 1102-1107, 1983
17. Wester K : Gender distribution and sidedness of middle fossa arachnoid cysts : a review of cases diagnosed with computed imaging. *Neurosurgery* 31 : 940-944, 1992