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Arachnoid cyst with spontaneous intracystic hemorrhage and associated chronic subdural hematoma: A case report

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ABSTRACT

INTRODUCTION AND IMPORTANCE: Spontaneous hemorrhage of the arachnoid cyst was rare, especially associated with chronic subdural hematoma (CSDH). In this paper, we reported successful surgical management of arachnoid cyst with spontaneous hemorrhage and associated subdural hematoma.
CASE PRESENTATION: A 33-year-old female with no medical history was presented with a headache for one month prior to admission. Head computed tomography and magnetic resonance imaging showed a left hypodense middle cranial fossa arachnoid cyst and ipsilateral CSDH. The multiple-slice computed tomography with contrast showed no vascular abnormality. The patient was indicated for surgical hematoma evacuation, membranectomy, and fenestration of the arachnoid cyst. At the one postoperative month, the computed tomography showed a middle fossa arachnoid cyst with no hemorrhage. Until a postoperative year, the patient had no headache and no neurological deficits. She returned to daily activities and her work.
CLINICAL DISCUSSION: This event's pathogenesis was thought of as a result of tearing of the outer wall of an arachnoid cyst. The most common cause was mild head trauma; however, spontaneous rupture of the cyst wall also occurred. Surgery was the most common and effective treatment. Evacuation of CSDH was mandatory, but the strategies treatment for arachnoid cysts varied. Surgical options for arachnoid cyst included endoscopic/microsurgical fenestration, membranectomy, and even the cysto-peritoneal shunting.
CONCLUSION: Arachnoid cyst with spontaneous intracystic hemorrhage accompanying CSDH was an uncommon condition. Surgery was the most common and effective treatment. Besides evacuation of CSDH, endoscopic/microsurgical fenestration or membranectomy was recommended to prevent the recurrence.

1. Introduction

An intracranial arachnoid cyst (AC) is a congenital or acquired cyst filled with cerebrospinal fluid and lined with arachnoid mater. Arachnoid cyst accounted for approximately 1% of all intracranial space-occupying lesions. Arachnoid cyst with intracystic hemorrhage was a rare complication and usually associated with head trauma [1–3]. Spontaneous hemorrhage of the arachnoid cyst accompanying with chronic subdural hematoma (CSDH) was even more unique [3–5]. In most case reports, the SDH was ipsilateral to the arachnoid cyst, but the contralateral CSDH also was reported [6].

The treatment options for the AC with spontaneous intracystic hemorrhage and associated CSDH were medication, follow-ups, and surgery [6–9]. Surgery was the most common and effective treatment. Most of the follow-up cases had an operation after that. Evacuation of CSDH and microsurgical fenestration of AC was the preferred technique used by many authors. Nonetheless, endoscopic fenestration, shunting, and membranectomy might be used [10–12]. This paper reported a successful surgical evacuation of CSDH, membranectomy, and microsurgical fenestration of AC with spontaneous intracystic hemorrhage and associated chronic subdural hematoma in a young female.

The work has been reported in line with the SCARE criteria [13].

2. Presentation of case

A 33-year-old female with no medical history was presented with a headache for one month prior to admission. Her pain was dull, persistent and got worse when she coughed. She had no history of head trauma. She did not have nausea and vom-

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Fig. 1. Computed tomography scan of the head showed left hypodense middle cranial fossa arachnoid cyst and chronic subdural hematoma. The multiple-slice computed tomography with contrast showed no vascular abnormality.

iting. On examination, she was alert and oriented. She had no paralysis and sensory deficits. She denied cranial nerve palsies. Computed tomography (CT) showed a left hypodense middle cranial fossa arachnoid cyst (Fig. 1). On magnetic resonance imaging, the arachnoid cyst was hypointense on T1W and FLAIR sequence, hyperintense on T2W sequence (Fig. 2). The multiple-slice computed tomography with contrast showed no vascular abnormality (Fig. 1). The coagulation tests were unremarkable. Preoperative definitive diagnosis was arachnoid cyst with spontaneous intracystic hemorrhage and associated chronic subdural hematoma.

The patient was indicated for surgical hematoma evacuation, membranectomy, and fenestration of the arachnoid cyst. A dose of preoperative prophylaxis antibiotic (cefotaxime 1 g, intravenous injection) was given. The incision was linear. We used temporal craniotomy. Intraoperatively, intracystic fluid was brown, had blood clots, and degenerative blood products. After carefully irrigating the fluid, we excised the arachnoid cyst wall for pathology and opened the cyst to the basal cistern by microscope. The histopathologic examination of the cyst wall was arachnoid mater.

The surgical operator was the head of department of neurosurgery and spine surgery at a tertiary teaching hospital. In addition, he was an associate professor of neurosurgery with an advanced level of surgical experience. Furthermore, he trained as a qualified neurosurgeon at University of Tours and Louis Pasteur University in France.

After the operation, the patient received analgesics (acetaminophen 1 g, intravenous administration three times per day), and saline solution (sodium chloride 1000 mL per day).

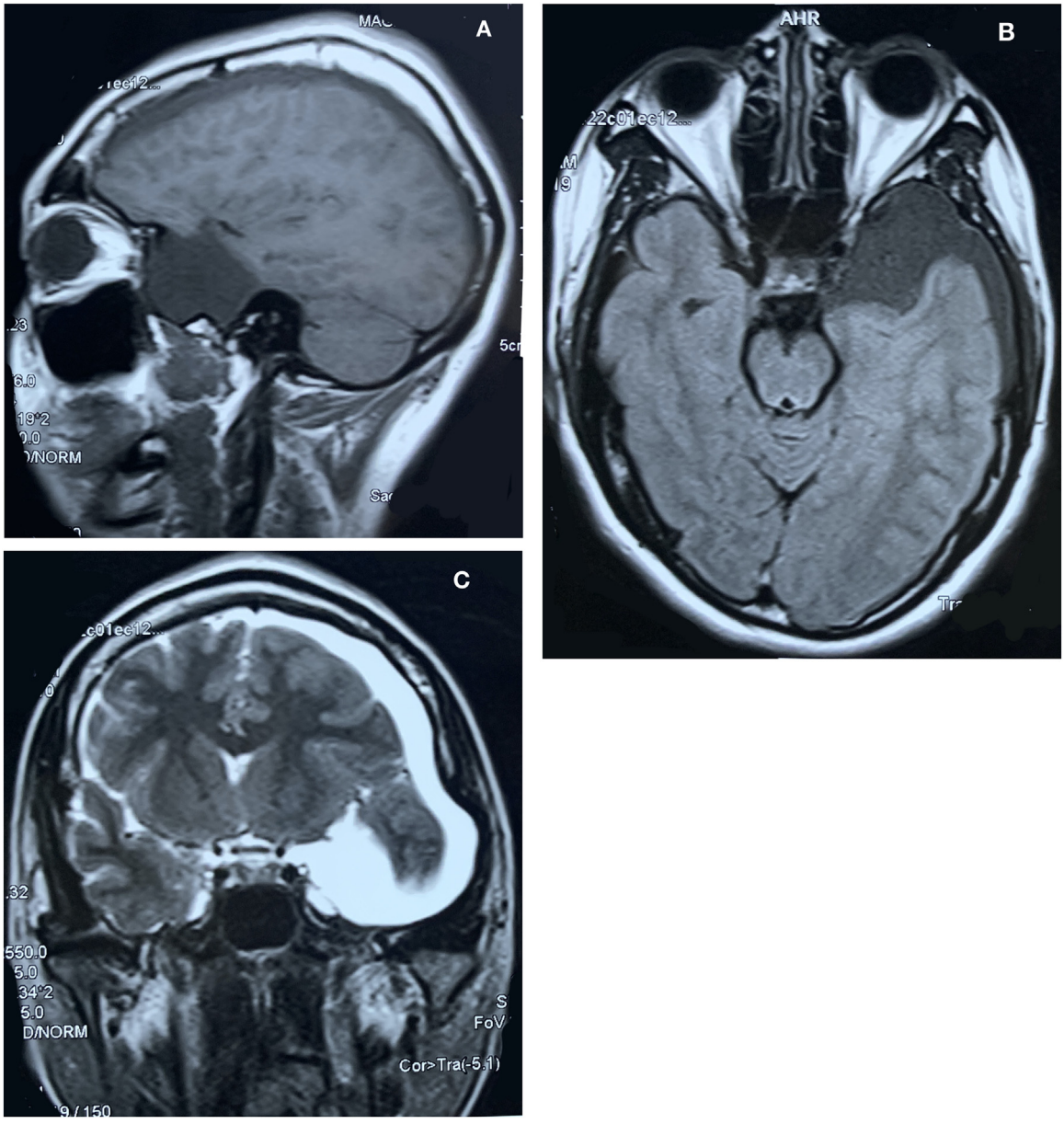

Fig. 2. On magnetic resonance imaging, the middle cranial fossa arachnoid cyst was hypointense on T1W and FLAIR sequence (A, B), hyperintense on T2W sequence (C).

The postoperative course was insignificant. She was discharged after five days. At the one postoperative month, the magnetic resonance imaging showed a temporal arachnoid cyst with no hemorrhage (Fig. 3). For a postoperative year, the patient had no headache and no neurological deficits. She was returned to daily activities and her work.

3. Discussion

Arachnoid cyst with spontaneous intracystic hemorrhage and the associated chronic subdural hematoma was an exceptional condition. This event's pathogenesis was thought of as a result of tearing of the outer wall of an arachnoid cyst. The most common cause was mild head trauma; however, spontaneous rupture of the wall also occurred [1,2,4,5,3]. The bleeding might come from bridging veins, unsupported blood vessels around the cyst wall, and leptomeningeal vessels in the cyst base [14]. Sometimes, arachnoid lining cells were capable of active CSF secretion. Therefore, rupture of enlarging AC might be the other cause of subdural or intracystic hemorrhage. In particular, the middle cranial fossa seems to be exclusive of this type [2,15]. Other risk factors of this hemorrhage were bleeding disorders (hematological disease, cancer, and anticoagulation medication), hypertension due to pre-eclampsia [16], infection, and hypervitaminosis [17].

Surgery was the most common and effective treatment. Evacuation of CSDH was mandatory, but the strategies treatment for arachnoid cysts was varied. Surgical options for arachnoid cyst included endoscopic/microsurgical fenestration, membranectomy, and even cysto-peritoneal shunting. For the non-hemorrhagic arachnoid cysts, Hall et al. showed that there is no significant difference in complication and re-operation rates among these techniques. All methods had the same rate of clinical and radiological improvements [12]. Similar techniques may be used for hemorrhagic AC. In hemorrhagic arachnoid cysts, hematoma recurrence was more prevalent when the cysts were not fenestrated or resected or drained [4].

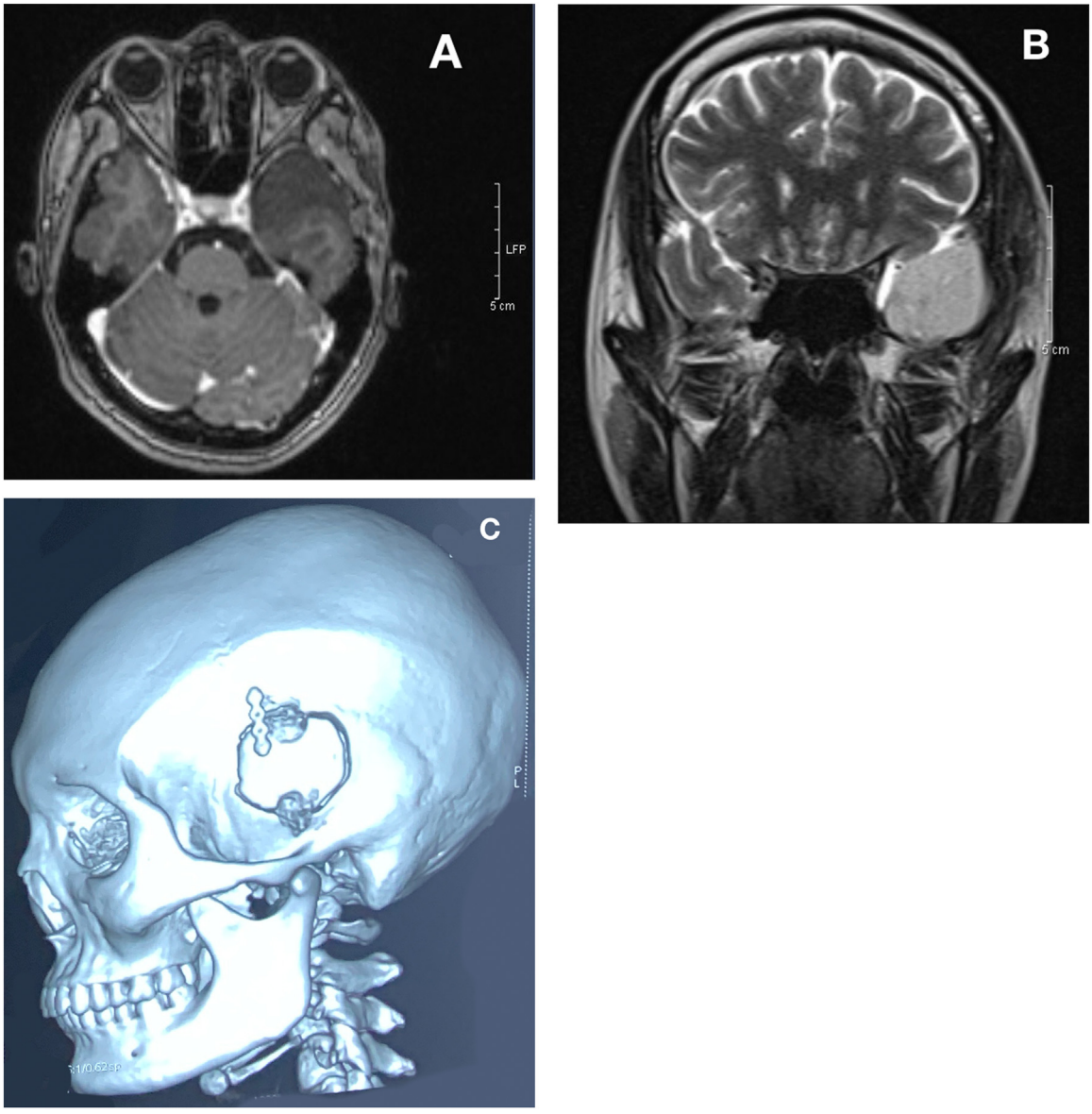

Fig. 3. At one-month postoperative follow-up, the magnetic resonance imaging showed middle cranial fossa arachnoid cyst with no hemorrhage (A, B). CT scan illustrated the temporal craniotomy (C).

4. Conclusion

Arachnoid cyst with spontaneous intracystic hemorrhage and the associated chronic subdural hematoma was an uncommon condition. Surgery was the most common and effective treatment. Besides evacuation of CSDH, endoscopic/microsurgical fenestration or membranectomy was recommended to prevent recurrence.

Declaration of Competing Interest

The authors report no declarations of interest.

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Ethical approval

The study was approved by the Research Ethics Committee of Hanoi Medical University. The procedures used in this study adhere to the tenets of the Declarations of Helsinki.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

- **Hung Dinh Kieu:** Conceptualization, Methodology, Investigation, Writing - Review & Editing, Supervision.
- **Tam Duc Le**: Conceptualization, Methodology, Investigation, Writing - Original Draft, Writing - Review & Editing, Visualization, Data collection.

- **Trung Quang Tran:** Visualization, Resources, Writing - Review & Editing, Data collection.

Registration of research studies

Not applicable.

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