Interhemispheric arachnoid cyst

Abdulrahman Albakr1,2, Nicholas Sader1, Sanju Lama1,3,4, Garnette R Sutherland1,3,4

1Department of Clinical Neurosciences, Cumming School of Medicine, University of Calgary, Calgary, Canada, 2Department of Surgery, Division of Neurosurgery, College of Medicine, King Saud University, Riyadh, Saudi Arabia, 3Department of Clinical Neurosciences, Hotchkiss Brain Institute, 4Department of Clinical Neurosciences, Arnie Charbonneau Cancer Institute, University of Calgary, Calgary, Canada.

E-mail: *Abdulrahman Albakr - dr.aalbakr@gmail.com; Nicholas Sader - nicksader8@gmail.com; Sanju Lama - slama@ucalgary.ca; Garnette R. Sutherland - garnette@ucalgary.ca

INTRODUCTION

Intracranial arachnoid cysts classically involve the middle cranial fossa.[5] Interhemispheric arachnoid cysts are uncommon, with only a few cases reported.[1,2,5,16] In children, interhemispheric arachnoid cysts are typically associated with other midline neurodevelopmental disorders, such as complete or partial agenesis of the corpus callosum.[2] While these cysts are sporadically seen in adults, they are usually identified in children.[16] To the best of our knowledge, only 20 cases of interhemispheric arachnoid cysts have been reported in adults.[1,3,6-12,14-16] Several management options have been described, including stereotactic aspiration, fenestration, cystocisternostomy, and placement of cystoperitoneal shunt.[2] Microsurgical and endoscopic fenestration are widely performed, which allow avoidance of cerebrospinal fluid (CSF) shunting along with its possible failure and related complications.[2]

Here, we report a case of a large interhemispheric arachnoid cyst successfully treated with microsurgical fenestration.

CASE PRESENTATION

A 27-year-old woman was referred to our neurosurgical clinic in early 2019 with worsening headache and short-term memory deficit. Neurological examination revealed no mental status or cranial nerve abnormalities. She was previously diagnosed with a primary interhemispheric...
arachnoid cyst in 2012 following syncope. At that time, the cyst was small and presumed incidental. The most recent brain magnetic resonance imaging (MRI) scan showed a large interhemispheric arachnoid cyst with partial agenesis of the corpus callosum. The lesion had grown significantly compared to her initial MRI study, with associated ventriculomegaly [Figure 1a-c]. Management options that included ongoing observation and endoscopic or microsurgical fenestration were discussed. Microsurgical management was preferred to avoid any untoward injury associated with placement or manipulation of an endoscope. Through a right frontal craniotomy, the arachnoid cyst was incised and fenestrated into both the interhemispheric cistern and lateral ventricle [Figure 1d-h and Video 1]. The postoperative recovery was unremarkable.

At the follow-up visit 3 months later, she reported substantial improvement in her headache and memory issues. A follow-up MRI scan 5 months after the surgery demonstrated successful surgical decompression with a decrease in cyst and ventricle size [Figure 1i]. Given the decrease in ventricular size and the patient’s clinical improvement, we assumed that CSF flow dynamics were re-established. While early follow-up imaging did not include CSF flow studies, these have been planned to be included in subsequent studies.

DISCUSSION

Interhemispheric fissure arachnoid cysts are uncommon congenital abnormalities, and only a few cases have been reported.\(^\text{1,2,5,16}\) Of 696 incidentally discovered arachnoid

---

**Figure 1:** (a) Initial T2-weighted axial magnetic resonance imaging (MRI) scan showing an interhemispheric arachnoid cyst with partial agenesis of the corpus callosum. (b and c) Preoperative T1 sagittal and T2 axial MRI scan showing the enlarging cyst with partial agenesis of the corpus callosum and ventriculomegaly. (d-h) Intraoperative microscopic views. (d) View from a right interhemispheric approach showing the falk cerebri, cingulate gyrus, and upper surface of the cyst. (e and f) Fenestration of the upper surface of the cyst with a view of the pericallosal arteries. (g) After incising and draining the cyst, fenestration was performed in the ventricular system. (h) View of the lateral ventricle following fenestration into both the interhemispheric cistern and lateral ventricle with dilation of the cyst wall. (i) Follow-up T1 sagittal MRI scan 5 months after the microscopic fenestration showing a successful surgical decompression with a decrease in the cyst and ventricle size.
cysts in adults, only four were located in the interhemispheric fissure.[11] They are usually diagnosed in children with other midline neurodevelopmental disorders.[2,13] Macrocrania, headache, seizures, and psychomotor retardation are the most frequent presentations.[2,13] Conversely, in adults, interhemispheric arachnoid cysts lack the associated midline neurodevelopmental changes and are far less common than in children.[16]

Controversy exists regarding surgical options. Yamasaki et al. reported an interhemispheric arachnoid cyst in an elderly patient, along with a literature review of similar cases.[16] In their study, seven of eight patients managed with open surgical techniques demonstrated excellent outcomes.[16] A systematic review of adults and children compared the results of craniotomy and cyst excision, cystoperitoneal shunting, and endoscopic fenestration. In that study, 663 arachnoid cysts that were identified, of which 44 were interhemispheric cysts.[4] Furthermore, among the patients with interhemispheric cysts, good clinical or radiological outcomes were reported in 89% of the patients who underwent craniotomy and cyst excision, and 75% of the patients who underwent endoscopic fenestration; endoscopic technique was preferred for suprasellar, quadrigeminal, and posterior fossa arachnoid cysts, whereas microsurgical fenestration was preferred for interhemispheric cysts.[4] In our case, the patient harbored an enlarging arachnoid cyst with associated progressive symptoms and was successfully treated with microsurgical fenestration.

CONCLUSION

Interhemispheric arachnoid cysts are rare in adults, with few reports in the literature. We successfully treated an adult patient with an enlarging interhemispheric arachnoid cyst and progressive symptoms with microsurgical fenestration.

Declaration of patient consent

Patient’s consent not required as patients identity is not disclosed or compromised.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Al-Holou WN, Terman S, Kilburg C, Garton HJ, Muraszko KM, Maher CO. Prevalence and natural history of arachnoid cysts in adults. J Neurosurg 2013;118:222–31.
2. Cinalli G, Peretta P, Spennato P, Savarese L, Varone A, Vedova P, et al. Neuroendoscopic management of interhemispheric cysts in children. J Neurosurg 2006;105 Suppl 3:194-202.
3. Deopujari CE, Shaikh ST, Karmarkar VS, Sudke AY, Mohanty CB, Biyani NK. Experience with management of infracranial arachnoid cysts. J Neurol Surg A Cent Eur Neurosurg 2021;82:43-52.
4. Gangemi M, Seneca V, Colella G, Gioffi V, Imperato A, Maiuri F. Endoscopy versus microsurgical cyst excision and shunting for treating infracranial arachnoid cysts. J Neurol Surg Pediatr 2011;8:158-64.
5. Helland CA, Lund-Johansen M, Wester K. Location, sidedness, and sex distribution of infracranial arachnoid cysts in a population-based sample. J Neurol Surg 2010;113:934-9.
6. Hirohata M, Matsu H, Miyagi J, Kajiha K, Shigemori M, Kuramoto S. Interhemispheric arachnoid cyst; report of three cases. No Shinkei Geka 1999;20:701-5.
7. Hishikawa T, Chikama M, Tsuboi M, Yabuno N. Two cases of symptomatic arachnoid cysts in elderly patients-a comparison and analysis with child cases. No Shinkei Geka 2002;30:959-65.
8. Jakubiak P, Dunsmore RH, Beckett RS. Supratentorial brain cysts. J Neurosurg 1968;28:129-36.
9. Karabatsou K, Hayhurst C, Buxton N, O’Brien DF, Mallucci CL. Endoscopic management of arachnoid cysts: An advancing technique. J Neurosurg 2007;106 Suppl 6:455-62.
10. Kotil K, Balci N, Bilge T. Intracranial symptomatic giant arachnoid cyst of the interhemispheric fissure presenting with frontal lobe syndrome. Turk Neurosurg 2007;17:147-51.
11. Matsu M, Hirai O, Munemitsu H, Kawamura J, Matsubayashi K. Arachnoid cysts-report of two adult cases in the interhemispheric fissure and over the cerebral convexity. Neurol Med Chir (Tokyo) 1982;22:71-6.
12. Novak Z, Chrestina J, Nadvornik P. Is interhemispheric arachnoid cyst with corpus callosum agenesis related to cavum vergae cyst? Bratisl Lek Listy 2006;107:435-8.
13. Spennato P, Ruggiero C, Alberti F, Buonocore MC, Trischitta V, Cinalli G. Interhemispheric and quadrigeminal cysts. World Neurosurg 2013;79 Suppl 2:S20.e1-7.
14. Tomabechi M, Takano K, Suzuki N, Daita G. A case of symptomatic interhemispheric arachnoid cyst in the elderly. No Shinkei Geka 1999;27:377-81.
15. Watanabe M, Kameyama S, Takeda N, Tanaka R. Two cases of symptomatic interhemispheric arachnoid cyst in the elderly. Surg Neurol 1994;42:346-51.
16. Yamasaki K, Kodama Y, Hotta T, Taniguchi E, Eguchi K, Yoshioka H, et al. Interhemispheric arachnoid cyst in the elderly: Case report and review of the literature. Surg Neurol 2003;59:68-74.

How to cite this article: Albakr A, Sader N, Lama S, Sutherland GR. Interhemispheric arachnoid cyst. Surg Neurol Int 2021;12:125.