



Article by Adolfsson et al. "Cognition in children with arachnoid cysts – A five-year follow-up after microneurosurgical fenestration"

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Article by Adolfsson et al. [1] "Cognition in children with arachnoid cysts – A five-year follow-up after microneurosurgical fenestration" adds further discussion to very contradictory entity of neurosurgery. Arachnoid cysts are one of the rare anomalies where no consensus has been achieved for a management algorithm in neurosurgery. Utilization of computed tomography (CT) then magnetic resonance imaging (MRI) facilitated their recognition as an incidental finding in almost 3% of the population. Nearly half of those are temporal arachnoid cysts. While most of them are recognized incidentally, symptoms and signs associated to arachnoid cysts supporting treatment are so nonspecific and common in the population that a coincidental relationship cannot be easily excluded [3, 10].

The core of discussion for a temporal arachnoid cyst is whether the symptomatology is clear enough to justify surgical treatment. Headaches and seizures were less likely to improve regardless of the decrease in cyst size [4–8]. A more controversial issue is to perform surgery for prophylactic purposes in asymptomatic cases. Besides risk of hemorrhage due to rupture, main concern of advocates is the unrecognized consequences such as psychomotor delay, impairment on cognition and mental function even in adult population. Studies on both adults and children report contradictory results on casual relationship and outcome after treatment [9, 11, 12].

Adolfsson et al. [1] in their meticulous study concluded that cognitive impairments detected in children are reversed immediately after microneurosurgical fenestration and remain stable thereafter. The results should be accepted with caution for several reasons. Besides small sample size for reliable statistical power, specificity and sensitivity of the applied tests are difficult to measure. Such tests probably

require a very experienced team with battery of tests modified for specific population especially for age and language. There is no doubt that this group is highly competent but similar groups from the same geographic region published contradictory conclusions on arachnoid cyst and cognitive function [2, 9, 11]. It is doubtful that such experienced team and modified tests is available universally. Interestingly, none of the cases in this article has been evaluated for cognitive or mental concerns initially. Cohort represents neither pediatric nor adults but adolescents. It is not clear whether this might influence test results without any evidence of cognitive impairment until diagnosis.

Arachnoid cysts, just like Chiari anomaly, represent one of the most speculative issues in neurosurgery with contradictory reports on indications, timing and type of surgical treatment. Unfortunately, there seems to be no universally accepted answers to these speculative issues in the near future. Neurosurgeons have to decide based on their ethical values, experience and protocol of their departments for decision.

References

1. Adolfsson T, Edström E, Tedroff K, Sandvik U (2024) Cognition in children with arachnoid cysts – A five-year follow-up after microneurosurgical fenestration. *Acta Neurochir*. <https://doi.org/10.1007/s00701-024-06120-z>
2. Agopian-Dahlenmark L, Mathiesen T, Bergendal Å (2020) Cognitive dysfunction and subjective symptoms in patients with arachnoid cyst before and after surgery. *Acta Neurochir* 162:1041–1050
3. Al-Holou WN, Yew AY, Boomsaad ZE, Garton HJ, Muraszko KM, Maher CO (2010) Prevalence and natural history of arachnoid cysts in children. *J Neurosurg Pediatr* 5(6):578–585
4. Choi JW, Lee JY, Phi JH, Kim SK, Wang KC (2015) Stricter indications are recommended for fenestration surgery in intracranial arachnoid cysts of children. *Childs Nerv Syst* 31(1):77–86
5. Kim KH, Lee JY, Phi JH, Kim SK, Cho BK, Wang KC (2020) Long-term outcome of large sylvian arachnoid cysts: the role of surgery has been exaggerated. *J Neurosurg Pediatr* 26(3):221–227

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6. Koch CA, Voth D, Kraemer G, Schwarz M (1995) Arachnoid cysts: does surgery improve epileptic seizures and headaches? *Neurosurg Rev* 18(3):173–181
7. Levy ML, Wang M, Aryan HE, Yoo K, Meltzer H (2003) Microsurgical keyhole approach for middle fossa arachnoid cyst fenestration. *Neurosurgery* 53:1138–1145
8. Orduna Martínez J, López Pisón J, Curto Simón B, García-Iñiguez JP, Samper Villagrasa P, Lafuente Hidalgo M (2022) Intracranial arachnoid cysts and epilepsy in children: Should this be treated surgically? Our 29-year experience and review of the literature. *Neurocirugia* 33(4):157–164
9. Rabiei K, Jaraj D, Marlow T, Jensen C, Skoog I, Wikkelsø C (2016) Prevalence and symptoms of intracranial arachnoid cysts: a population-based study. *J Neurol* 263:689–694
10. Di Rocco C (2010) Sylvian fissure arachnoid cysts: we do operate on them but should it be done? *Childs Nerv Syst* 26(2):173–175
11. Spansdahl T, Solheim O (2007) Quality of life in adult patients with primary intracranial arachnoid cysts. *Acta Neurochir (Wien)* 149:1025–1032
12. Wester K, Hugdahl K (1995) Arachnoid cysts of the left temporal fossa: impaired preoperative cognition and postoperative improvement. *J Neurol Neurosurg Psychiatry* 59:293–298

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