


Consensus on the management of aneurysmal subarachnoid hemorrhage-related hydrocephalus

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Management of Aneurysmal Subarachnoid Hemorrhage-Related Hydrocephalus

Aneurysmal subarachnoid hemorrhage-related hydrocephalus (aSAH-H) resulting from the excessive accumulation of cerebrospinal fluid (CSF) has a complex pathology



Consensus and diagnostic criteria for the active treatment of aSAH-H are currently lacking

What are the surgical indications and protocols that must be observed for hydrocephalus following aSAH?

Expert consensus based on the latest literature

<h4 style="text-align: center;">Pathogenesis</h4> <p>Increased production, decreased absorption, and circulatory disturbance of CSF</p>	<h4 style="text-align: center;">Clinical manifestations</h4> <p>Chronic hydrocephalus</p> <ul style="list-style-type: none"> Cognitive dysfunction Gait disturbance Urinary incontinence <p>Acute hydrocephalus</p> <ul style="list-style-type: none"> Intracranial pressure Papilloedema Headaches Disorders of consciousness 	<h4 style="text-align: center;">Diagnosis</h4> <ul style="list-style-type: none"> • Review • Patient's aSAH-H history • Manifestations of chronic/acute hydrocephalus • CT and MRI examination • Lumbar puncture to clarify hydrocephalus
<h4 style="text-align: center;">Risk factors</h4> <ul style="list-style-type: none"> Age Location of aneurysm Neurological status onset Intraventricular hemorrhage Volume of hemorrhage 	<h4 style="text-align: center;">Management of postoperative complications</h4> <ul style="list-style-type: none"> • Strict aseptic procedures during drainage and a ventriculoperitoneal shunt • Pressure management using anti-siphon and pressure-adjustable catheters 	<h4 style="text-align: center;">Treatment</h4> <p>Chronic hydrocephalus</p> <ul style="list-style-type: none"> • Ventriculoperitoneal shunt • Laparoscopy for abdominal catheterization • Lumbar puncture (TAP) test before surgery <p>Acute hydrocephalus</p> <ul style="list-style-type: none"> • External ventricular drainage • Clipping test for safe drainage tube removal

This consensus, based on updated references from China and abroad, can serve as a reference for clinicians to improve the diagnosis and treatment of aSAH-H

Chinese expert consensus on the management of aneurysmal subarachnoid hemorrhage-related hydrocephalus
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Aneurysmal subarachnoid hemorrhage-related hydrocephalus (aSAH-H) is a complex condition resulting from the excess accumulation of intracranial cerebrospinal fluid. However, current there is no consensus in China and abroad on how to manage aSAH-H. Now, expert neurosurgeons in China put forward their recommendations for the management of aSAH-H, having reviewed the latest published literature. Credit: Hua Lu of Jiangsu Province Hospital and Shuo Wang of Capital Medical University

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Aneurysmal subarachnoid hemorrhage-related hydrocephalus (aSAH-H) is a clinical syndrome that leads to excessive accumulation of cerebrospinal fluid (CSF) and ventricle enlargement in the brain. aSAH-H is a complex pathophysiological syndrome and can often lead to cognitive impairment and neurological damage. Acute hydrocephalus (less than 3 days of aSAH) can result in a fatal cerebral hernia, whereas chronic hydrocephalus (more than 3 days of aSAH) can adversely affect a patient's quality of life.

Despite the complexity associated with this condition, there is a lack of diagnostic criteria and [treatment protocol](#) for aSAH-H, not only in China, but also elsewhere. Moreover, the lack of [consensus](#) among clinicians on the preferred treatment for aSAH-H calls for an urgent need for clarity and consistent standards.

Prof. Shuo Wang from the Department of Neurosurgery at Beijing Tiantan Hospital, Capital Medical University, recently led an expert group from China to review and compose a consensus on the management of aSAH-H. The study was published in the form of a consensus guideline in the *Chinese Neurosurgical Journal*. Dr. Hua Lu from the Department of Interventional Neuroradiology at Jiangsu Province Hospital along with Prof. Wang are the corresponding authors of this study.

"Hydrocephalus is a common complication following aSAH and currently, the diagnosis and treatment of aSAH-H is clouded by a lack of clarity and inconsistency of standards. We wanted to make definite progress toward removing the ambiguity tied to its treatment," explains Prof. Wang. The panel of experts reviewed latest literature on aSAH-H from China and other countries to build a consensus.

In terms of occurrence, the experts identified that aSAH-H is determined by the location of the aneurysm, intraventricular

hemorrhage, and volume of the subarachnoid hemorrhage. Disturbances in CSF circulation drive the pathogenesis of aSAH-H, enlarge the ventricular system, and damage the brain's white matter. In terms of factors contributing to the risk of aSAH-H, the experts concluded that age, volume of subarachnoid hemorrhage, the location and size of aneurysms are related to the occurrence.

The consensus states that the standard-of-care approach to diagnosis should include reviewing a patient's history of aSAH-H, identifying its clinical manifestations, and a head computed tomography (CT) scan to detect abnormal enlargement of the ventricles.

Moreover, the consensus states that the main objective of aSAH-H treatment should be to release excessive intracranial pressure or address pathological changes to brain tissue to prevent further damage and loss of neurological function. This can include medications inhibiting CSF secretion or surgical interventions, such as CSF drainage, CSF shunt surgery, and CSF intracranial diversion.

Furthermore, the consensus guideline recommends external ventricular drainage and ensuring the safe removal of the CSF drainage tube in the case of acute hydrocephalus. A ventriculoperitoneal shunt is recommended for cases of chronic hydrocephalus. The effectiveness of a shunt procedure can be confirmed with a positive lumbar puncture preceding surgery.

Lastly, the consensus suggests measures to minimize postoperative complications. It recommends strict aseptic surgical procedures, anti-siphon and pressure-adjustable shunt catheters, monitoring of [clinical manifestations](#), and use of imaging and laboratory examinations for management.

Evincing hope about this development, Prof. Wang says, "This expert

consensus applies to adults, but it's a good reference point for clinical diagnosis and treatment. Further research will certainly refine the process of aSAH-H diagnosis and treatment."

More information: Jun Pu et al, Chinese expert consensus on the management of aneurysmal subarachnoid hemorrhage-related hydrocephalus, *Chinese Neurosurgical Journal* (2023). [DOI: 10.1186/s41016-022-00314-z](https://doi.org/10.1186/s41016-022-00314-z)

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