

<https://doi.org/10.1016/j.bas.2024.103908>

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Brain and Spine 4 (2024) 103906

Predictors of Cerebrospinal Fluid Shunt Success in Idiopathic Normal Pressure Hydrocephalus: A Systematic Review

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Idiopathic normal pressure hydrocephalus (NPH) is the most common type of adult hydrocephalus. Gait, cognitive and urinary disturbances are the most commonly presenting symptoms however, definitive diagnosis is not possible solely based on the clinical picture and according to guidelines definitive diagnosis can only be established retrospectively after a positive response to ventriculoperitoneal shunt surgery (VPS) is achieved. We aim to summarize current evidence of the predictive value of reported parameters for cerebrospinal fluid (CSF) shunting success in patients with NPH.

Methods: We conducted a systematic review of literature in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. We searched the PubMed database for articles published until February 2024 using the following search algorithm: (((((((shunt, ventriculoperitoneal[MeSH Terms]) OR (ventriculo gall bladder shunt)) OR (ventriculoatrial shunt)) OR (ventriculopleural shunt)) OR (thecoperitoneal shunt)) OR (lumboperitoneal shunt))) AND (hydrocephalus, normal pressure[MeSH Terms]) Filters: English, Humans. We included studies reporting clinical or radiological outcomes of CSF shunting for NPH. We excluded secondary NPH, studies in any language other than English, non-clinical studies, non-primary research, and case reports. Two independent reviewers assessed each abstract and all included abstracts for eligibility. Any disagreement was resolved by consensus of both reviewers. Relevant data was extracted into a pretested master table based on current literature.

Results: 475 abstracts were screened, and 253 were reviewed in full text. 122 studies of 9131 patients were included in our analysis after full text review. VPS was performed more commonly than lumboperitoneal shunting mostly using programmable valves. Gait was the most common symptom assessed pre- and postoperatively, followed by cognition and incontinence, respectively. The callosal angle was the most investigated radiological sign investigated preoperatively other than ventriculomegaly. Postoperative follow-up ranged from 1 week to >5 years. 5542 patients showed improvement after shunting.

Conclusions: VPS is an effective treatment for NPH. Gait disturbances are commonly reported in NPH and might be a reliable clinical indicator for VPS success. However, further investigation is necessary.

<https://doi.org/10.1016/j.bas.2024.103906>

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Brain and Spine 4 (2024) 103907

Fluorescein Guided Surgical Treatment of D7-D8 CSF-Venous Fistula: Case Report and Literature Review

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Oral e-Poster Presentations - Booth 4: Adult CSF 2, October 16, 2024, 4:40 PM - 5:20 PM

Background: An anomalous outflow of cerebrospinal flow (CSF) from spinal subdural periradicular space to veins of internal or external vertebral plexus, or basivertebral plexus is hypothesized as the pathogenic mechanism of CSF-Venous Fistula (CVF). It is a rare cause of spontaneous intracranial hypotension (SIH) and very difficult to detect.

Methods: The authors reported a case of CVF and a narrative non-systematic review with a specific analysis on the use of intraoperative fluorescein.

Results: since 2011, 111 surgical approaches were reported, but with intrathecal fluorescein in only 4 patients. Following diagnosis of bilateral thin (3mm)

hygroma and thrombosis of Superior Sagittal Sinus and left Trolard Vein at Angio-CT scan and angio-MRI, a 58 years-old man was investigated with serial cranial CT scans, due to the persistent 3-months history with olocranic headache, nausea and vomiting. Due to a fluctuating postural aspect of symptoms, in the suspicion of SIH, a spinal MRI was performed, but no CSF leak was identified. Because of persisting symptoms, a spinal myelography disclosed a D7-D8 right CVF.

The patient underwent, a minimal invasive right D7-D8 foraminotomy, through a paramedian skin incision. A 4 ml of solution of fluorescein and ringer lactate (10%) was intrathecally injected through a percutaneous lumbar catheter. A filling of D8 nerve root and of two paravertebral fistulous veins was observed 2 minutes after injection. Thus, the coagulation of the anomalous communication has been optic guided by fluorescein uptake. Patient had immediate post-operative complete regression of symptoms. Radiological findings confirmed the treatment.

Conclusions: CVF should be considered a cause of SIH, when no other causes are detected on basic neuroradiological workout, especially with persistent symptoms. Myelography is the key for the diagnosis. Intrathecal intraoperative fluorescein allows the visualization of the CVF, the proper coagulation of the draining vein and the confirmation of the CVF occlusion.

Optional Image

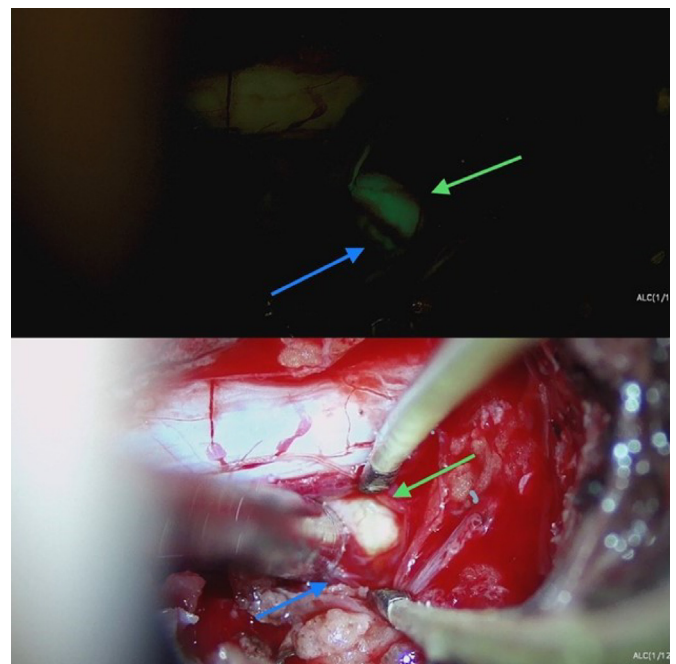


Figure 1: Right D8 spinal root (green arrows) and one of the radicular fistulous vein (blue arrow). Correlation between intra-operative fluorescein filter and normal vision.

<https://doi.org/10.1016/j.bas.2024.103907>

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Brain and Spine 4 (2024) 103908

Prospective investigation of the relationship between preoperative melatonin levels and typical symptoms in patients with pineal cysts

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Oral e-Poster Presentations - Booth 4: Adult CSF 2, October 16, 2024, 4:40 PM - 5:20 PM

Background: Melatonin (ML) is synthesized in the pineal gland and is subject to a circadian rhythm. Patients with symptomatic pineal cysts (PC) - who do not have hydrocephalus - suffer from a variety of symptoms in addition to cephalgias and sleep disorders. However, the pathomechanism is still unclear - a disturbed ML secretion is being discussed. However, the data regarding melatonin levels in patients with PC is still insufficient.