

# Lumboperitoneal shunt for idiopathic normal pressure hydrocephalus case series

## 2021

Yerneni et al. retrospectively reviewed 25 patients with LP horizontal-vertical (LP-HV) shunts placement for initial treatment for iNPH from 2014 to 2019. All patients had preoperative gait dysfunction, 16 (64%) had urinary incontinence, and 21 (84%) exhibited cognitive insufficiency. Two weeks post-shunt placement, 23/25 (92%) patients demonstrated improvement in gait, 11/16 (68%) had improvement in incontinence, and 14/21 (66%) had improvement cognitive insufficiency. At six months or greater follow up 13/20 (65%) had improvement in gait, 7/15 (47%) showed improvement in incontinence, and 11/15 (73%) demonstrated improvement in cognitive function. Six patients (24%) required at least one revision of the LP shunt. Shunt malfunctions resulted from CSF leak in one patient, shunt catheter migration in two patients, peritoneal catheter pain in one patient, and clinical symptoms for overdrainage in two patients. Thus, demonstrate that LP-HV shunt placement is safe and efficacious alternative to VP shunting for iNPH, resulting in notable symptomatic improvement and low risk of [overdrainage](#), and may be considered for patients where cranial [approaches](#) should be avoided <sup>1)</sup>.

## 2020

Todisco et al. recruited 78 iNPH patients. At baseline, subjects underwent clinical and neuropsychological assessments, 3 T magnetic resonance imaging (MRI), and [tap test](#). After baseline, 44 patients (LPS group) opted for LPS implantation, whereas 34 subjects (control group) declined surgery. Both cohorts were then followed up for 12 months through scheduled clinical and neuropsychological evaluations every 6 months. 3 T MRI was repeated at 12-month follow-up.

Gait, balance, and urinary continence improved in the LPS group, without significant influence on cognitive functions. Conversely, gait and urinary continence worsened in the control group. No preoperative MRI parameter was significant outcome predictor after LPS. Of relevance, in responders to LPS, we found postoperative reduction of periventricular white matter (PWM) hyperintensities, which were instead increased in the control group.

LPS is safe and effective in iNPH. An early surgical treatment is desirable to prevent clinical worsening. Post-surgery decrease of PWM hyperintensities may be a useful MRI marker surrogate for clinical effectiveness of LPS <sup>2)</sup>.

## 2018

Nakajima et al. analyzed compared programmable pressure valves/+small lumen abdominal catheters (SLs) to programmable pressure valves/+ gravitational “add-on” using different opening pressures for supine and standing positions.

115 patients with [idiopathic normal pressure hydrocephalus](#) in 2 consequent cohorts: 48 patients receiving LPSs with gravitational “add-on” and programmable pressure valves and 67 patients receiving LPSs with programmable pressure valves/+ gravitational “add-on”. The modified Rankin Scale (mRS), Japan iNPH grading scale, Mini Mental State Examination, Frontal Assessment Battery, and CSF biomarkers were evaluated.

Comparisons of postoperative clinical factors in 64 patients in the PPV/+SL and PPV/+GV groups using 1:1 propensity score matching revealed differences in the mean ( $\pm$ standard deviation) postoperative mRS ( $2.65 \pm 1.07$  vs  $2.16 \pm 1.02$ ,  $P = .049$ ) and gait disturbance scores ( $1.97 \pm 1.03$  vs  $1.39 \pm 0.92$ ,  $P = .011$ ). Thus, outcomes improved in the LPS group with the GV. Serious and nonserious adverse event rates for the PPV/+SL and PPV/+GV groups were 22.9% and 19.4% ( $P = .647$ ) and 38% and 17.9% ( $P = .018$ ), respectively, indicating higher rates of subdural collections for the PPV/+SL group.

This is the first study to examine LPS treatment for iNPH using a GV in tandem with a PPV. The results suggest that the CSF shunt flow volume is restricted in the standing position and maintained in the supine position, thus improving iNPH symptoms. This may reduce intracranial CSF hypotension-related complications <sup>3)</sup>.

## 2015

Between March 1, 2010, and Oct 19, 2011, 93 patients with idiopathic normal pressure hydrocephalus were enrolled and randomly assigned to the immediate treatment group ( $n=49$ ) or the postponed treatment group ( $n=44$ ). More patients in the immediate treatment group than in the postponed treatment group had an improvement of one point or more on the mRS at 3 months: 32 (65%) of 49 in the immediate group vs 2 (5%) of 44 in the postponed group (difference 61% [95% CI 42-68];  $p<0.0001$ ). The number of patients who had an improvement of one point or more on the mRS at 12 months after surgery was similar between the two groups: 30 (67%) of 45 patients in the immediate group vs 22 (58%) of 38 in the postponed group (difference 9% [95% CI -14 to 31];  $p=0.496$ ). The proportions of patients with serious adverse events did not differ significantly between the groups during the 3 months post-randomisation (7 [15%] of 46 in the immediate group vs 1 [2%] of 42 in the postponed group;  $p=0.060$ ). During the 12 months after surgery, 19 (22%) of 87 patients had serious adverse events, the most common of which was cerebral infarction (six patients [7%]).

The results suggest that lumboperitoneal shunt surgery might be beneficial for patients with idiopathic normal pressure hydrocephalus and, if these findings are confirmed in larger studies, could be a first-line treatment option for this disease <sup>4)</sup>.

## 2012

Bloch and McDermott retrospectively reviewed 33 patients with LP- horizontal-vertical valves (HVV) shunts inserted for the treatment of iNPH from 1998 to 2009. Patients were evaluated for improvements in gait, urinary function, and dementia after shunt placement. All patients had evidence of ventriculomegaly and a positive response to pre-operative lumbar puncture or extended lumbar drainage. All 33 (100%) patients had pre-operative gait dysfunction, 28 (85%) had incontinence, and 20 (61%) had memory deficits. Mean follow-up time was 19 months. Following shunt placement, 33/33 (100%) patients demonstrated improved gait, 13/28 (46%) had improvement in incontinence, and 11/20 (55%) had improvement in memory. Shunt failures requiring revision occurred in nine patients (27%), with an average time to failure of 11 months. Infections occurred in two patients (6%). There were no neurologic complications, including no hemorrhages. Thus, LP-HVV shunt placement is a safe and effective alternative to ventriculoperitoneal shunting for iNPH, resulting in significant symptomatic improvement with a low risk of overdrainage. It should be considered as an option for the treatment of patients with iNPH who demonstrate clinical improvement following lumbar drainage <sup>5)</sup>.

1)  
Yerneni K, Karras CL, Larkin CJ, Weiss H, Hopkins B, Kesavabhotla K, Potts MB, Tate MC, Bloch O. Lumboperitoneal shunts for the treatment of idiopathic normal pressure hydrocephalus. J Clin

Neurosci. 2021 Apr;86:1-5. doi: 10.1016/j.jocn.2020.12.031. Epub 2021 Jan 25. PMID: 33775310.

2)

Todisco M, Picascia M, Pisano P, Zangaglia R, Minafra B, Vitali P, Rognone E, Pichiecchio A, Ceravolo R, Vanacore N, Fasano A, Pacchetti C. Lumboperitoneal shunt in idiopathic normal pressure hydrocephalus: a prospective controlled study. *J Neurol*. 2020 Sep;267(9):2556-2566. doi: 10.1007/s00415-020-09844-x. Epub 2020 May 5. PMID: 32372182.

3)

Nakajima M, Miyajima M, Akiba C, Ogino I, Kawamura K, Sugano H, Hara T, Tange Y, Fusegi K, Karagiozov K, Arai H. Lumboperitoneal Shunts for the Treatment of Idiopathic Normal Pressure Hydrocephalus: A Comparison of Small-Lumen Abdominal Catheters to Gravitational Add-On Valves in a Single Center. *Oper Neurosurg (Hagerstown)*. 2018 Dec 1;15(6):634-642. doi: 10.1093/ons/opy044. PMID: 29688482; PMCID: PMC6373832.

4)

Kazui H, Miyajima M, Mori E, Ishikawa M; SINPHONI-2 Investigators. Lumboperitoneal shunt surgery for idiopathic normal pressure hydrocephalus (SINPHONI-2): an open-label randomised trial. *Lancet Neurol*. 2015 Jun;14(6):585-94. doi: 10.1016/S1474-4422(15)00046-0. Epub 2015 Apr 28. PubMed PMID: 25934242.

5)

Bloch O, McDermott MW. Lumboperitoneal shunts for the treatment of normal pressure hydrocephalus. *J Clin Neurosci*. 2012 Aug;19(8):1107-11. doi: 10.1016/j.jocn.2011.11.019. Epub 2012 Jun 15. PMID: 22705135.

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Last update: 2021/04/22 11:50

