

# Lumboperitoneal shunt for idiopathic normal pressure hydrocephalus

The standard of care for idiopathic normal pressure hydrocephalus (iNPH) is placement of a [ventriculoperitoneal shunt](#). However, VP shunts require intracranial intervention and are associated with notable postoperative complications, with some groups reporting complication rates for VP shunts ranging from 17 to 33%, along with failure rates up to 17.7%. [Lumboperitoneal shunts](#) are an alternative for Cerebrospinal fluid shunt that do not require intracranial surgery, thus providing utility in patients where intracranial surgery is not possible or preferred <sup>1)</sup>.

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[Lumboperitoneal shunts](#) showed [effectiveness rates](#) that were similar to those of [ventriculoperitoneal shunts](#) in [idiopathic normal pressure hydrocephalus](#) and can be recommended for the [treatment](#) of [patients](#) with [Idiopathic normal pressure hydrocephalus](#) (iNPH) because of their minimal invasiveness and lack of lethal complications <sup>2)</sup>.

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>3)</sup>.

Lumboperitoneal shunt surgery has the potential to alleviate symptoms of [normal pressure hydrocephalus](#) but the benefits of such surgery have not been tested in a [randomized control trial](#).

Although they are thought to be less invasive, they are used less frequently compared with ventriculoperitoneal shunts in the treatment of communicating hydrocephalus. This may be due to limitations such as troublesome patient positioning, difficulty in valve pressure confirmation and adjustment, and concerns regarding [overdrainage](#).

To reduce the abovementioned shortcomings, there is a new device called [SiphonGuard](#) <sup>4)</sup>.

## Complications

see [Lumboperitoneal shunt complication](#)

## Management with the Codman Hakim programmable valve

Thirty-two patients with [normal pressure hydrocephalus](#) were managed using the lumboperitoneal shunt system in which the Codman Hakim programmable valve was utilized. The initial opening pressure was set at 100 mm H(2)O in three cases, 80 mm H(2)O in two, 70 mm H(2)O in three cases, 50 mm H(2)O in 23, and 30 mm H(2)O in one case (mean pressure 57.8 mm H(2)O). In 12 patients the valve pressure required reprogramming. The final valve pressure was 30 mm H(2)O in four cases, 50 mm H(2)O in 19, 70 mm H(2)O in three, 80 mm H(2)O in one, 100 mm H(2)O in two, 130 mm H(2)O in one, 140 mm H(2)O in one, and 170 mm H(2)O in one case (mean 62.5 mm H(2)O). Lumboperitoneal

shuntography was performed in five patients by injection of contrast medium into the prechamber. In two patients a shunt obstruction developed between the valve and the lumbar catheter. Complications occurred in eight patients. Low-pressure symptoms such as headache and vomiting were observed in four patients but disappeared after increasing the valve pressure. One patient, whose shunt pressure was set at 50 mm H<sub>2</sub>O developed a slight asymptomatic subdural effusion, which resolved after increasing the valve pressure to 100 mm H<sub>2</sub>O. Convulsions developed in two aged patients but were easily controlled with anticonvulsant medication. Surgery-related wound infection was observed in one patient. The major advantage in the use of this valve is the ability to modify the pressure noninvasively. Another important advantage of the LP shunt system in which this valve is incorporated is the lower pressure of 30 mm H<sub>2</sub>O that can improve symptoms caused by underdrainage of cerebrospinal fluid <sup>5)</sup>.

Nakajima et al. developed a minimally invasive [lumboperitoneal shunt](#) placement procedure conducted after administration of a local anesthetic. The procedure involves placing a guide wire and a peel-away sheath under fluoroscopic and CT guidance. Between June 2004 and August 2006, 40 patients (21 men and 19 women; mean age 72.5 years [range 33-86 years]) underwent surgery. A Codman Hakim programmable valve system (82-3844, Codman & Shurtleff, Inc.) was used for the procedure. The mean operating time was 53 minutes, and 7 patients (17.5%) developed shunt dysfunction complications. These complications comprised an infected shunt valve in 2 patients, postoperative lower-limb pain in 1 patient, and shunt obstruction (caused by debris and hemorrhage) at the ventral and lumbar ends in 2 patients each. This procedure is less invasive than conventional lumboperitoneal shunt insertion and could be performed as an outpatient surgery for treatment of idiopathic normal-pressure hydrocephalus <sup>6)</sup>.

## Case series

[Lumboperitoneal shunt for idiopathic normal pressure hydrocephalus case series.](#)

## References

<sup>1)</sup>

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