ShuntAssistant®

Antisiphon device from Miethke.

Case series

Between July 2003 and July 2006, 42 patients underwent ventriculoperitoneal shunt surgery with a Codman Hakim programmable valve (Codman, Johnson & Johnson, Raynham, USA) and a Miethke ShuntAssistant (Miethke Gmbh, Potsdam, Germany). These patients were followed up for a period between 2 years (35 patients) and 4 years (18 patients) after surgery.

The systematic re-programming of the valves from 100 mmH(2)O to 70 mmH(2)O and then to 50 mmH(2)O after 3 months allowed the brain to adapt to the implanted valve without the complication of overdrainage. The responder rates were 86% after two years and 83% after four years. Overdrainage was seen in 3% of the cases, mechanical complications occurred in 6%.

The results indicate that the combination of a Codman Hakim programmable valve with a Miethke ShuntAssistant could improve outcomes in shunted iNPH. This finding has yet to be proven in a larger, prospective randomized trial [1)].

A total of 26 adults (age range, 17-75 yr) with macrocephaly and progressive hydrocephalus symptoms underwent implantation of either an adjustable Codman Hakim gravity-assisted shunt (Codman Medos, LeLocle, Switzerland) plus an Aesculap-Miethke ShuntAssistant (Miethke KG, Kleinmachnow, Germany) or a nonadjustable gravitational shunt (Aesculap-Miethke gravity-assisted valve). The follow-up period averaged 29 +/- 13 months (range, 6-48 mo).

Significant sustained clinical improvement was achieved in 87% of patients. In more than 90% of patients, Evans index decreased postoperatively by less than 10%. No correlation was documented

between the degree of ventricle width reduction and clinical improvement. Only two patients developed subdural hematoma, which was caused by insufficient hydrostatic pressure compensation owing to errors in estimation of intraperitoneal pressure.

Unlike conventional differential pressure shunts, gravitational shunts can be used in the treatment of high-risk patients with longstanding overt ventriculomegaly in adults. Significant risk of overdrainage can be avoided. Gravitational shunts offer a viable alternative to endoscopic third ventriculostomy, provided the choice and adjustment of the shunt opening pressure is based on a correct assessment of the hydrostatic pressure to be compensated for [2].

1)
Lemcke J, Meier U. Improved outcome in shunted iNPH with a combination of a Codman Hakim programmable valve and an Aesculap-Miethke ShuntAssistant. Cent Eur Neurosurg. 2010 Aug;71(3):113-6. doi: 10.1055/s-0029-1241179. Epub 2010 Apr 6. PubMed PMID: 20373276.
2)
Kiefer M, Eymann R, Strowitzki M, Steudel WI. Gravitational shunts in longstanding overt ventriculomegaly in adults. Neurosurgery. 2005 Jul;57(1):109-19; discussion 109-19. PubMed PMID: 15987546.