

# The Miethke Dual Switch Valve: Experience in 169 Adult Patients with Different Kinds of Hydrocephalus: An Open Field Study

## Authors

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## Key words

- hydrocephalus
- complications
- overdrainage
- Miethke dual switch valve
- DSV
- shunt systems

## Abstract

**Object:** In spite of the development of approximately 200 different shunt systems within the last 50 years, overdrainage and valve obstructions are still major problems in the current treatment of hydrocephalus. In 1994, a new gravitational valve with different opening pressures (depending upon the patient's posture) and a big contact area to CSF was introduced by Miethke and co-workers (DSV). We report about a single institution's experience in the treatment of 169 adult patients with different kinds of hydrocephalus with this valve.

**Methods:** We retrospectively reviewed the clinical and radiological data of all patients who were treated with a DSV between 1998 and 2005 at our institution. A telephone interview was performed at the end of the study, to determine the overall shunt survival. We analysed the outcome and the shunt-related complications.

**Results:** Among 169 patients with DSV, we had 70 patients with normal pressure hydrocephalus (NPH), 40 patients with communicating hydrocephalus due to SAH, 31 patients with communicating hydrocephalus not due to SAH and 28 patients with occlusive hydrocephalus. We had a

rate of shunt responders of 93.2%, an overdrainage rate of 3.2% and no valve obstruction in the whole series. The overall shunt survival was 81% after 82 months (mean follow-up: 47.6 months). All implantations were performed by the whole staff, as well as by residents of the neurosurgical department.

**Discussion:** Among the currently available shunt systems, this series is one with the lowest complication rates due to overdrainage and valve obstructions. In patients with NPH, where low opening pressures are essential, the DSV seems to bear an advantage because of a high drainage rate and, in spite of this, a low rate of overdrainage. Even in patients with relatively high CSF protein content, we did not observe any valve obstruction. This study was an open field analysis providing data about the current complication rates of hydrocephalus treatment with this shunt system, outside of a specialized hydrocephalus team or a prospective study trial. However, this study is a retrospective analysis and a prospective randomized controlled trial is required for the comparison of these valves with other shunt systems, such as programmable and flow-controlled ones is required for the future.