

Gravitational Shunt Complications After a Five-Year Follow-Up

Michael Kiefer and Regina Eymann

Abstract

Introduction Gravitational shunts (G-valves) for ventriculo-peritoneal (VP) shunting have been available since 1996. We analyzed shunt complications in patients with a complete minimum follow-up of 5 years.

Material and Methods Between 1996 and 2002, we implanted 282 VP G-valves in various forms of adult chronic hydrocephalus, of which 130 provided a complete data set with an annual follow-up. Adjustable and non-adjustable G-valves were used: the Miethke Dual-Switch valve, the Miethke GAV-valve and a combination of adjustable Codman-Hakim valves with the Miethke Shunt-Assistant. In cases of supposed mechanical shunt failure, the explanted shunts were examined in a bench test.

Results The total complication rate was 21%:3% shunt infections, 3% catheter dislocation/fracture, 5% underdrainage and 9% overdrainage occurred. Half of the overdrainage complications could be managed conservatively. Underdrainage complications resulted from the chosen opening pressure being too high (n = 3), a secondary increase in intraperitoneal pressure (n = 2) or from “real” shunt failure in one case according to bench test results.

Conclusion G-valves demonstrate sufficient long-term performance over multiple years, and real shunt-related complications are rare. The frequency of revision due to overdrainage is low (4.5%).

Keywords Hydrocephalus • iNPH • shunt • gravitational shunts • complication • disconnection • dislocation • shunt infections • overdrainage • underdrainage

M. Kiefer (✉)

Department of Neurosurgery, Saarland University Medical School,
Kirrberger Street, Building: 90.1, Homburg-Saar 66421, Germany
e-mail: Michael.Kiefer@uks.eu

R. Eymann

Department of Neurosurgery, Medical School, Saarland University,
Kirrberger Street, Building 90, Homburg-Saar, Saarland 66421, Germany