Abstract

Dual-Switch Valve: A New Concept in the Treatment of Hydrocephalus Avoiding Inappropriate Drainage

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Presently available hydrocephalus valves have two major drawbacks: they have a tendency to clog and/or they do not take into account the posture of the patient, resulting in unphysiological overdrainage in the upright position. School-age children and young adults bearing a low resistance shunt since their first years of life are prone to overdrainage-related problems such as subdural effusions, skull deformities, and slit ventricle syndrome. Changing these low-resistance shunts into medium- or high-resistance shunts may be one solution, but another way is the use of a siphon preventing device such as the ASD™ or the Delta™ valve, although these devices are prone to late malfunction due to shrinkage of the surrounding tissues. The development of a new hydrostatic controlled valve gives rise to a more optimistic view of shunt therapy.

The dual-switch™ valve has been implanted in more than 50 patients. Clinical performance is very satisfying. Ventricular size was reduced slowly and gently, with good clinical performance and—where applicable—normalized intracranial pressure values. There were no infectious problems, and no overdrainage-related complications were noted.

The very slow and slight reduction in ventricular size, as proved by CCT, is remarkable. This, together with the complete lack of overdrainage-related complications such as slit ventricles or subdural effusions, is thought to be the result of the more physiological drainage of CSF by the hydrostatic hydrocephalus valve. Clinical performance and patient acceptance of the dual-switch™ valve was encouraging.

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