

# Correlation between decreased ventricular size and positive clinical outcome following shunt placement in patients with normal-pressure hydrocephalus

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*Object.* It is well known that in patients with communicating hydrocephalus or normal-pressure hydrocephalus (NPH), ventricular size decreases following implantation of shunts with differential pressure valves. The aim of this study was to determine whether ventricular size correlates with a positive clinical outcome following shunt placement.

*Methods.* Hydrostatic valves (dual-switch valves) were implanted in 80 patients with NPH at Unfallkrankenhaus, Berlin, between September 1997 and January 2002. One year postoperatively, these patients underwent computerized tomography scanning, and their ventricular size was ascertained using the Evans Index.

Among 80% of the patients who showed no postoperative change in ventricular volume, 59% nonetheless had good to excellent clinical improvements, 17% satisfactory improvement, and 24% no improvement. Furthermore, a moderate reduction in ventricular size was observed in 14% of patients in this cohort. Among these, 36% experienced good to excellent clinical improvements, 28% satisfactory improvement, and 36% unsatisfactory improvement. A marked reduction in ventricular size was observed in 6% of the patients. Of this latter group, 60% demonstrated good to excellent outcomes, whereas 40% had unsatisfactory outcomes.

*Conclusions.* Favorable outcomes following the implantation of a hydrostatic shunt in patients with NPH did not correlate with decreased ventricular volume 1 year after surgery. In fact, better clinical outcomes were observed in patients with little or no alteration in ventricular size, compared with those in patients with a marked decrease in ventricular size. A postoperative change in ventricular volume should be assessed differently in patients with NPH compared with those suffering from hypertensive hydrocephalus.

**KEY WORDS** • normal-pressure hydrocephalus • ventricle • Evans Index • shunt • dual-switch valve • hydrostatic valve