Normal pressure hydrocephalus

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This issue of the Journal of Neurosurgery contains a well-conducted study by Götz and colleagues, who examined the long-term outcome of patients undergoing shunt treatment for normal pressure hydrocephalus (NPH). This debilitating and progressive disorder is relatively understudied, especially as it pertains to the durability of symptom relief in the years following shunt treatment. The strengths of this study are many. First, a standardized and rigorous diagnostic approach to identify patients most likely to respond to shunt treatment was applied. This included objective documentation and quantification of gait apraxia, ventricular enlargement as assessed using the Evans Index, elevated resistance during a lumbar puncture infusion test, and at least 20% improvement in walking speed and step count after a large-volume lumbar puncture test. Second, patient outcome after shunting was assessed regularly and objectively by using a validated assessment tool developed specifically for patients with NPH: the NPH recovery rate, based on the Kiefer Scale scoring system, which assesses gait, cognitive decline, urinary incontinence, headache, and vertigo. Third, all 61 patients included in the study had at least 6 years of clinical follow-up, which represents the largest cohort of patients with this duration of follow-up in the literature. Weaknesses of this study include its retrospective design, its lack of specific exclusion criteria (for example, were patients with cognitive decline at presentation excluded from shunt treatment?), its lack of standardized surgical technique (for example, a variety of shunt valves were utilized throughout the study), and its lack of third-party adjudication of outcome.

The study has three important observations. First, shunt therapy in a well-selected population of patients with NPH produces significant improvement in neurological outcome. This finding confirms data in multiple past studies and overall strengthens the argument that not only the neurological but also the physiological health of patients with NPH should be included in the identification of those who will most likely benefit from surgical intervention. Third and most importantly, the improvement in neurological outcome following shunt treatment is durable for at least 6 years in the majority of NPH patients. This finding also strengthens the evidence that shunting is a valuable intervention for appropriately identified NPH patients. One point of controversy is whether the degree of neurological improvement realized after shunt treatment is sustained in the long term. In the present study, although the mean 6-year Kiefer Scale score was significantly lower than the mean preoperative score, a trend for a reduction in the neurological benefit afforded in Year 3 versus Year 6 post-shunting was documented. Others have examined this issue, with some documenting a similar decline and others showing strong durability in the late follow-up. Unfortunately, the present study does not truly clarify this issue, and additional studies in larger groups of patients and/or with a longer-term follow-up will be required.

Overall, the authors are to be congratulated on an important contribution to the literature. Their study documents the neurological benefit afforded by shunting in the largest group of NPH patients monitored for such an extended period of time to date. Therefore, their results provide valuable additional evidence as to the efficacy and durability of this treatment modality for NPH patients.

Disclosure
The author reports no conflict of interest.

References
Response

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We appreciate Dr. Zipfel’s favorable editorial comments on our study. With admirable clarity, he drew attention to the important questions and the weak points of our paper and of idiopathic NPH studies overall.

Dr. Zipfel criticizes the lack of a standardized surgical technique as regards the valve types. Since valve technology is a developing field, a variety of valve types is almost unavoidable in large patient cohorts, although the difference between programmable and nonprogrammable valves and between gravitational and conventional valves has been proven to be very important.

Another point of criticism is the lack of third-party adjudication of the outcome. We would appreciate cooperation with another department, for example, neurologists, to cross-check patient outcomes. But this would create a high workload over a 6-year period, and unfortunately there is no tradition for such cooperation in everyday work in Germany.

We very much appreciate learning that an American colleague positively reflects on the Kiefer Scale score and the NPH recovery rate. In our opinion, these are the most useful disease-specific outcome scales for NPH patients.

Overall, there is still a discrepancy between the pathophysiological knowledge about the different forms of NPH and the ability to treat patients successfully. Against this background, valuable clinical studies are as important as progress in the theoretical understanding of NPH.

References


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