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Changing definition of non-responsiveness to shunting – the influence of valve-adjustability

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Background

The published data of clinical results in larger series of shunted hydrocephalus reveal a remarkable broad spectrum, ranging from 31% to over 90% in the relatively well-outlined subgroup of NPH. This discrepancy in clinical results, which also exists in other aetiologies, is not only due to different inclusion criteria, variability of pressure-settings or length of follow-up. In addition there exists a controversy concerning the group of "non-responders" up to now. By our experience with a new adjustable valve we would like to elucidate the changing definition of this entity.

Materials and methods

The investigation of non-responsiveness following shunting was conducted by comparing our experience in valves with fixed opening-pressure and the evaluation of the results after implantation of the adjustable gravitation-assisted valve (proGAV) from February 2004 to September 2006 in 82 patients of different etiologies. We focused on complications, differentiating those related to the valve-function from those not dependent on the device, and on indications to change the opening pressure. Finally we concentrated on the radiological outcome and the clinical results including the possibilities for improvement by readjustments.

Results

In 54 patients we did not see an indication to change the initial pressure setting and the clinical results were satisfying in 49. The first group of "non-responders" are those with a reduction of ventricular size but no clinical improvement. But an only minimal or even no reduction of ventricular size can be accompanied by a positive clinical "response". The combination of unsatisfying clinical outcome and unchanged ventricles necessitates ruling out shunt-insufficiency before adding this cohort to the group of non-responders. In 18 cases with the "complication" of functional underdrainage we saw an indication to lower the opening pressure. 7 patients suffering overdrainage related complications could be treated successfully by elevating the pressure setting.

Conclusion

In the "stone-age" of shunt-therapy too many patients were classified as belonging to the non-responders only because of surgical mistakes, infectious or mechanical complications. Only those patients should be subsumed under the category of "non-responders", who, after exclusion of shunt-insufficiency and relevant accompanying illnesses, do not improve clinically after exchange of valves with fixed opening pressure or following adequate alteration of pressure-setting in programmable devices. In cases with severe intra-operative or postoperative complications the term "non-responder" should be avoided. The results of the proGAV-series support our opinion that the majority of re-operations can be avoided and the number of responders to shunting can be increased.