

Oral Presentation

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## The enigma of underdrainage in shunting of hydrocephalus

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### Clinical background

The first reports about mechanical complications after shunting dealt mainly with overdrainage-related problems. But especially since the introduction of hydrostatic valves, complications related to underdrainage gain increasing attention. However, an unequivocal evaluation of underdrainage is hindered by discrepancies in the definition of this entity.

also stresses the necessity to improve the preoperative diagnostic tools in order to avoid functional underdrainage. Furthermore we want to point out the importance of adjustability of the valve in selected cases.

### Materials and Methods

In a series of 202 patients of different etiologies treated with the hydrostatic Dual-switch-valve (DSV), 22 cases were suspected of suffering from underdrainage. Using a new algorithm to differentiate between different causes of mechanical obstruction on the one hand and "functional" underdrainage, we saw an indication to exchange the DSV to one with a lower opening pressure in 15 cases.

### Results

Out of the patients with suspected functional underdrainage, only 11 cases did improve clinically and/or radiologically. The failures are probably due to the multiplicity of possible reasons for a functional underdrainage. Besides the wrong choice of a too high pressure level by the surgeon, the intraperitoneal pressure up to now remains a 'black box'. Furthermore there is a small percentage of cases, especially patients with idiopathic Normal Pressure Hydrocephalus and hydrocephalus following severe brain trauma, in whom the optimal intraventricular pressure-level for improvement after shunting is lower than normal or physiological ICP.

### Conclusions

The discrepancies in the definition of under-drainage are the main reason for the differences regarding the incidence of this important mechanical complication reported in the shunt-literature. The outcome of our series