

Gravitational valves in supine patients with ventriculo-peritoneal shunts

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Abstract

Background In the subgroup of bedridden hydrocephalic patients with ventriculo-peritoneal shunts and gravitational valves, we occasionally observed persisting hydrocephalic complaints even when mechanical or infection-related obstruction was excluded.

Methods To investigate the cause of these hydrocephalic symptoms, in vitro and in vivo analyses were used to determine valve opening, intra-abdominal and hydrostatic pressure of an Aesculap-Miethke 10/40 cm H₂O gravitational valve at different angles of upper body and head inclination.

Findings Since hydrostatic pressure is lacking, the resulting intra-ventricular pressures are shown to peak up to 27 cm H₂O in supine patients with head, but not upper body inclined.

Conclusions We conclude that in the subgroup of bedridden patients with ventriculo-peritoneal shunts and gravitational valves, upright posture is a prerequisite for proper cerebrospinal fluid drainage.

Keywords Gravitational valve · Ventriculo-peritoneal shunt · Hydrocephalus

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