Underdrainage

Implantation of a shunt in a hydrocephalic patient still carries a risk of complications such as overdrainage and underdrainage. Gravitational valve units are especially designed to minimize the problem of overdrainage. Nevertheless, these valves carry a risk of underdrainage. The best choice of valve for a patient is still challenging. The purpose of a survey was to identify in which patients a gravitational shunt valve is liable to lead to under-drainage.

Patients with hydrocephalus entered prospectively into a data base were reviewed retrospectively. The patients were treated between January 2006 to the end of Feb 2007 and those experiencing under- or over-drainage were identified.

Thirty-five ventriculo-peritoneal shunt systems were implanted in adult patients. The cause of the hydrocephalus was: normal pressure hydrocephalus in 18 patients, post-haemorrhagic following subarachnoid or Intracerebral hemorrhage in 11, associated with a tumour in four and followed a head injury in two patients. Three different valves were used: an adjustable shunt valve with gravitational unit (Pro-GAV 0-20/25 in 21 patients), a gravitational shunt valve with fixed opening pressure (GAV 5/30 in nine patients) and an adjustable differential valve (Hakim medos in five patients). Four patients developed severe, valve-related under-drainage. Each had received a gravitational shunt valve and all were bedridden. In two of these patients it was necessary to change the valve. One patient who had received a differential valve, after regaining mobility developed severe over-drainage with bilateral subdural haematomas. Over-drainage was not seen in long-term bedridden patients with a differential shunt valve.

If a bedridden patient with a gravitational shunt valve system lies with a slightly elevated head, this leads to activation of the gravitational unit and this may cause under drainage. As a result, we advise not using an anti-siphon devices in a patient who is bedridden for a long period [1)].

1)
Kaestner S, Kruschat T, Nitzsche N, Deinsberger W. Gravitational shunt units may cause under-drainage in bedridden patients. Acta Neurochir (Wien). 2009 Mar;151(3):217-21; discussion 221. doi: 10.1007/s00701-009-0215-7. Epub 2009 Feb 24. PMID: 19238319.