Valve reservoir

The benefit of shunt-integrated reservoirs for the treatment of hydrocephalus, cysts, or other pouches is generally accepted, and numerous designs are already available on the market.

Provision of a separate subcutaneous CSF reservoir is of proven benefit in allowing access to the cerebral ventricles to measure ICP and allow removal of CSF in an emergency [1].

see Shunt obstruction diagnosis.

Types

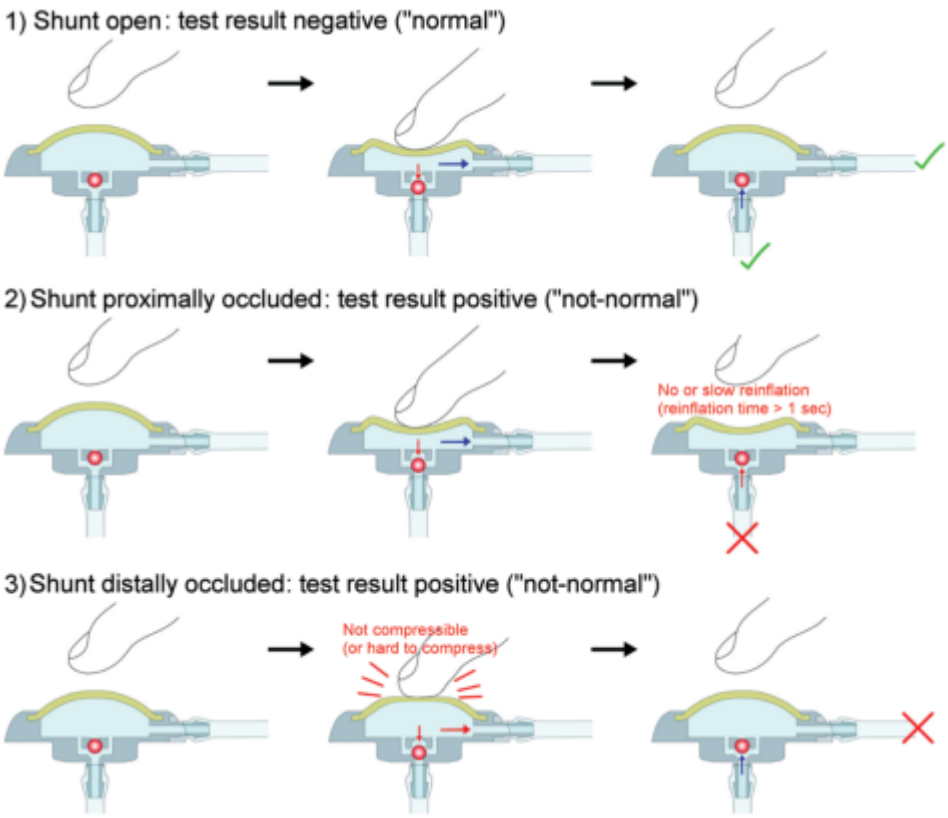
The types include bore-hole or inline reservoirs (prechambers or integrated into the valve).

By puncturing the reservoir intracranial pressure can be measured, or CSF can be removed in case a rapid decompression is required. If an infection is suspected, CSF composition can be analyzed and medications or contrast media and so on can be injected into the ventricles.

Since the early days of shunt technology, the valve was also used for pumping (or synonymously flushing) to control the shunt function.

Likewise, pumping was considered to be a useful means for carefully removing shunt occlusions.

Flushing test is nowadays in worldwide use for testing shunt sufficiency.



The majority of the authors still doubt the usefulness of this basic test.

Complications of valve reservoirs or flushing devices are seldom reported as a cause of shunt malfunction. Martinez-Lage et al. document their experience in six cases of mechanical complications of shunting devices. Two cases presented with collapse and intracranial migration of the valve reservoir, a complication that has not been reported previously. In two cases, the plastic dome became disconnected from the metallic base of the reservoir. A fifth patient, with an integral shunt system, showed a fracture in the soldered join of the distal tube to the reservoir dome. The last patient had the valve reservoir partially collapsed by bone growth at the time of shunt revision [2)]

[1)]
Lo TYM, Myles LM, Minns R (2003) Long-term risks and benefits of a separate CSF access device with ventriculoperitoneal shunting in childhood hydrocephalus. Dev Med Child Neurol:28–33
[2)]
Martinez-Lage JF, Poza M, Esteban JA. Mechanical complications of the reservoirs and flushing devices in ventricular shunt systems. Br J Neurosurg. 1992;6(4):321-5. PubMed PMID: 1388825.