

S26 – Imaging’s Impact on Shunt Outcomes

OBJECTIVES

- Provide an overview of shunt function and indications for use.
- Discuss the role of imaging in diagnosis, treatment and maintenance of these conditions through shunt placement.

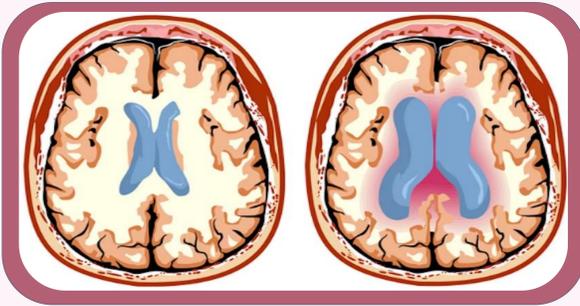


Figure 1

CONDITIONS

Hydrocephalus: Abnormal accumulation of cerebrospinal fluid in the brain.

- Congenital Hydrocephalus (present at birth)
- Acquired Hydrocephalus (medical complications, ex: brain tumor) (UCSF Benioff Children’s Hospitals, n.d)
- Normal Pressure Hydrocephalus (unknown cause, typically in older adults) (Froedtert & MCW, n.d)
- Idiopathic Intracranial Hypertension (Mayo Clinic, n.d)
- External Ventricular Drain (EVD) (trauma) (JennBechard, 2025)

Symptoms:

- Rapid increase in head size
 - Trouble with coordination and balance
 - Vision changes
 - Dizziness
 - Headaches
- (Liz, 2025)

SHUNT OVERVIEW

Medical devices used to manage conditions that cause cerebrospinal fluid to accumulate in the brain or spinal cord. Without proper drainage, this excess fluid can increase intracranial pressure and lead to serious neurological damage. A shunt works by redirecting excess fluid from the brain or lumbar spine to another part of the body where it can be safely absorbed (Johns Hopkins Hydrocephalus and Cerebral Fluid Center, n.d).



Figure 3

X-RAY

- X-rays shunt series can consist of AP/PA and lateral skull views, AP/lateral views of the cervical spine, an AP/PA chest image and an AP abdomen.
- Overlapping images allow providers to assess entirety of shunt and identify issues such as misplacement, fractures, disconnections or kinks. (Jones & Murphy, 2020).

COMPUTED TOMOGRAPHY

- CT scans provide detailed anatomical information about the specific ventricular size and catheter location/positioning.
- CT is also utilized for the pre-operative imaging helping to determine ventricular size and provide a roadmap for where the shunt should be inserted (Wallace et al., 2014).

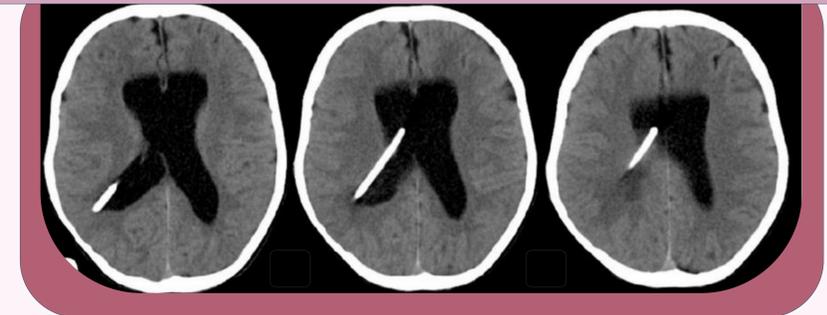


Figure 4

MAGNETIC RESONANCE IMAGING

- Phase contrast and diffusion imaging are capable of detecting subtle changes in CSF flow patterns. This enables physicians to identify potential shunt blockages or complications before symptoms develop (Wallace, 2014).

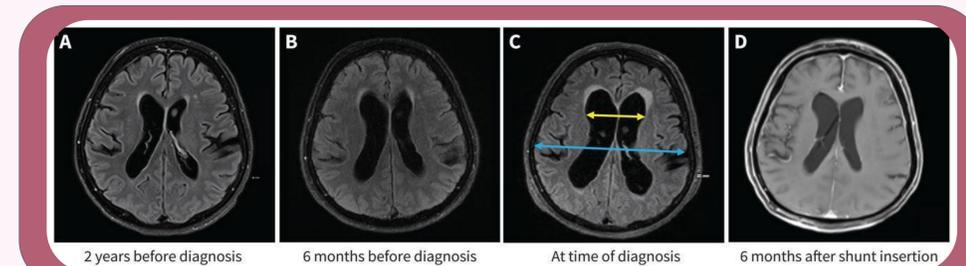


Figure 5

CONCLUSION

Imaging has made shunt care much safer by helping providers place them accurately, enabling continuous monitoring and allowing early detection of complications. These improvements have lowered complication rates, reduced the need for revision surgeries and supported better patient recovery.

Figure 2 EVD

