

Endoscopic and derivative procedures in hydrocephalus

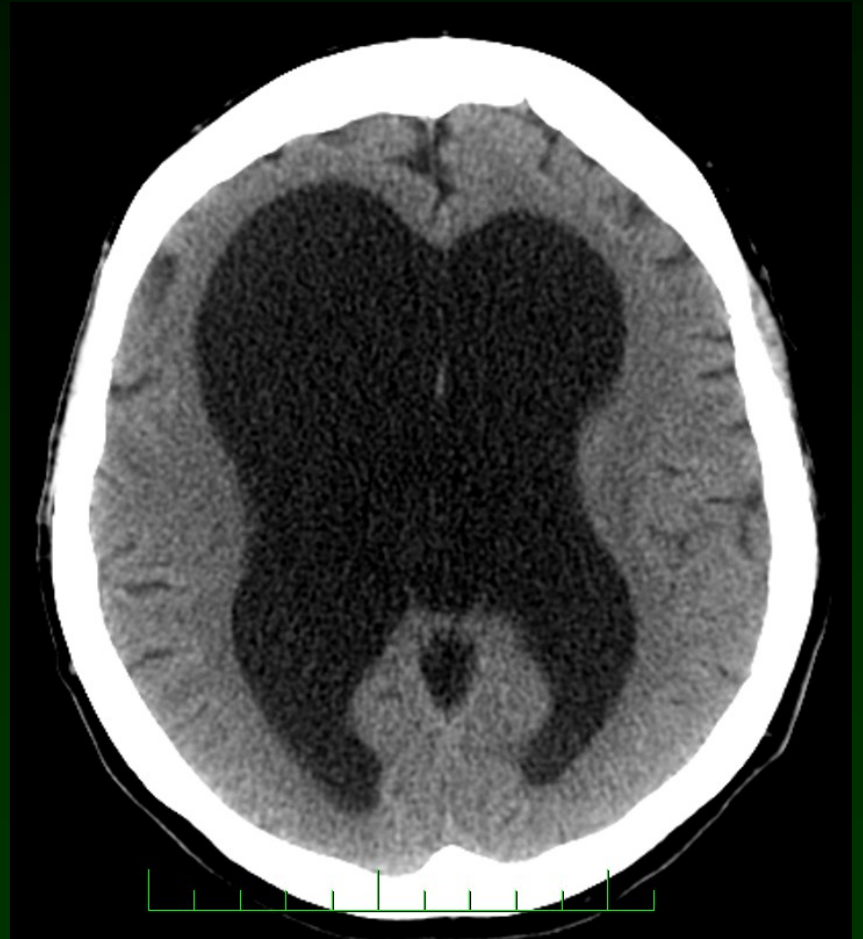
Treatment of hydrocephalus

- observation
- conservative treatment
- **surgery**
 - temporary (acute HCP)
 - external ventricular drainage
 - external lumbar drainage
 - permanent (chronic HCP)
 - shunt
 - neuroendoscopy
 - others
(Torkildsen drainage etc.)

Case 1

- **female, 67-year-old**
- **sudden onset – confused, impairment of speech**
- **duration of symptoms: 10-15 min.**
- **no other symptoms**
- **physical exam negative**

Case 1



Case 1

- TIA
- congenital hydrocephalus
- no symptoms = no treatment

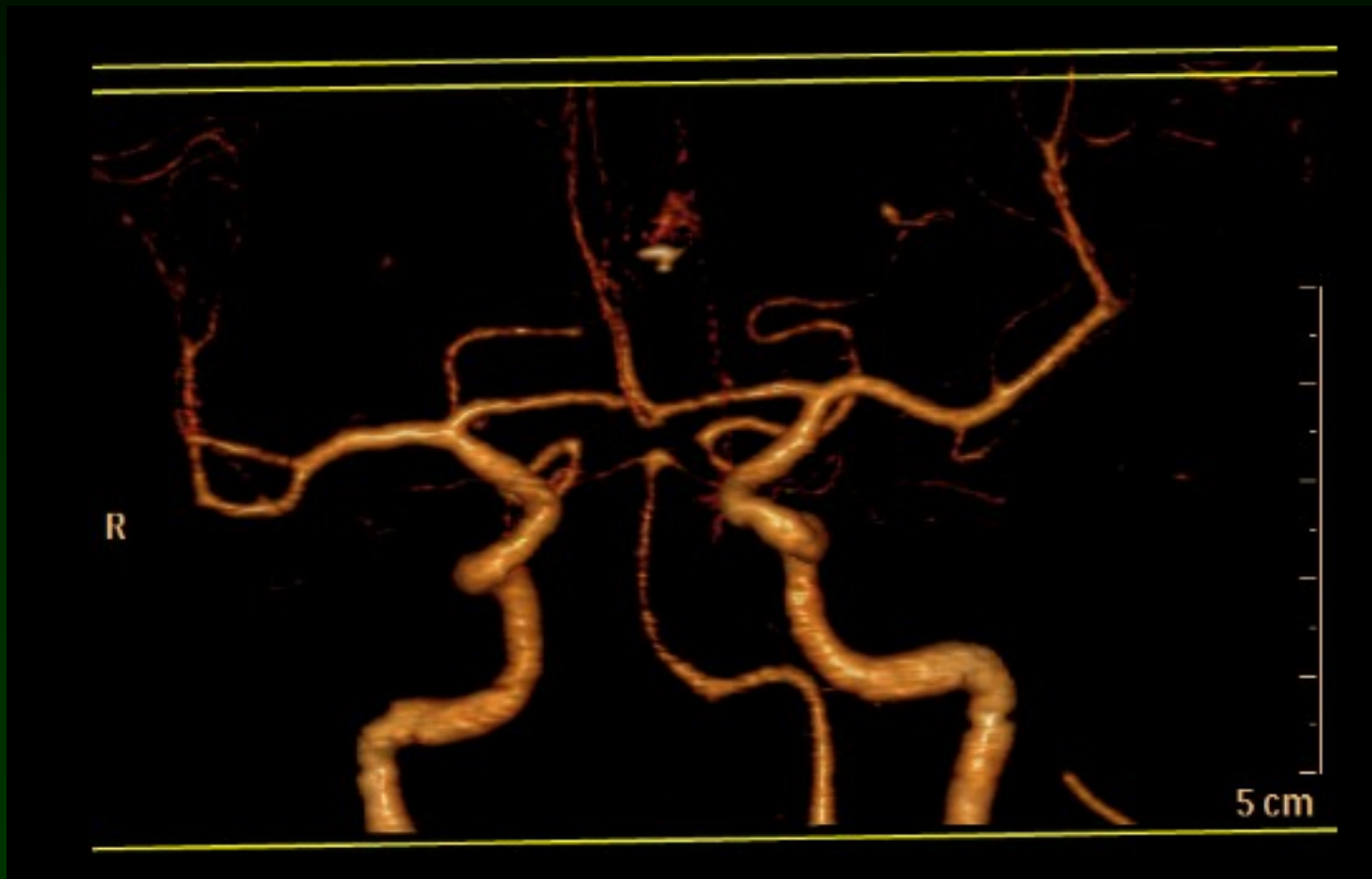
Case 2

- **male, 60-year-old**
- **sudden onset of headache, vomiting**
- **meningeal signs, no focal neurological deficit**

Case 2



Case 2



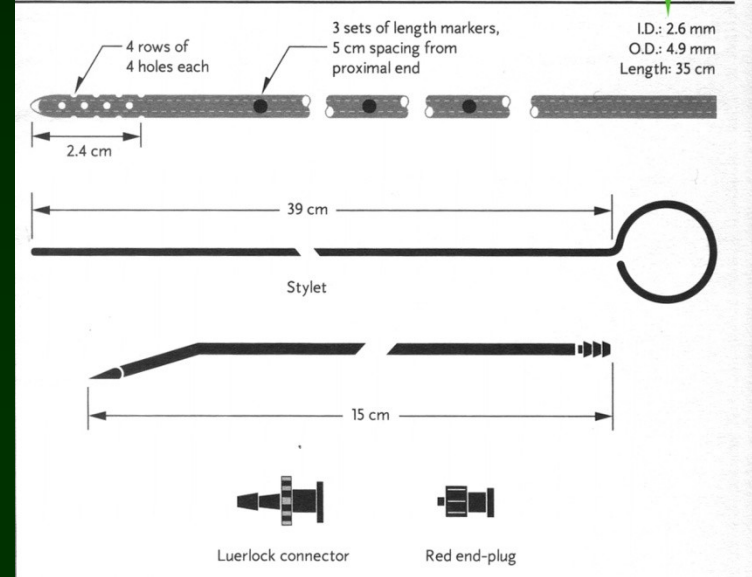
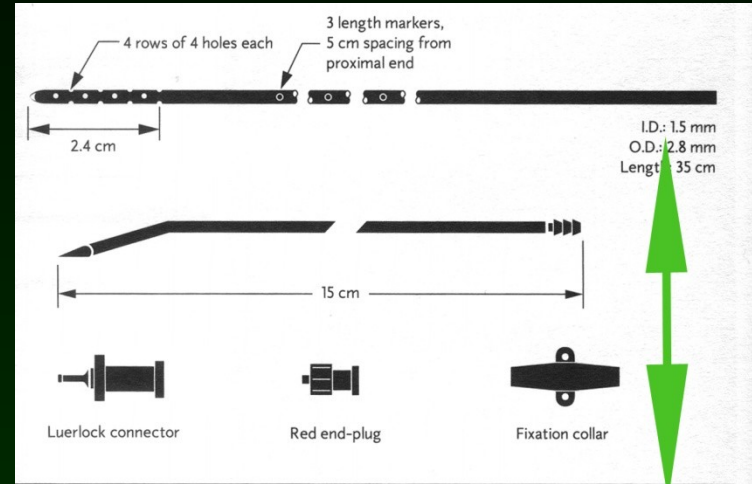
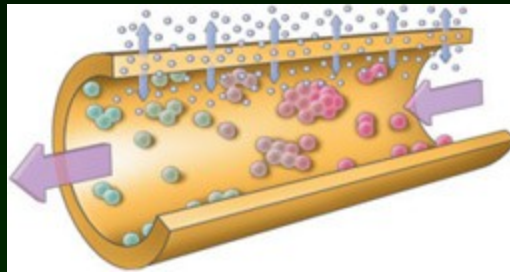
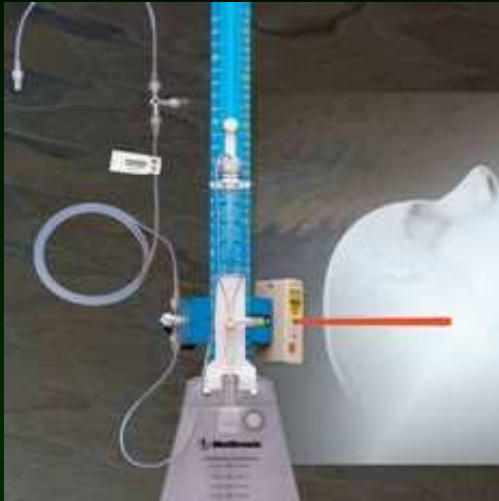
Case 2



Case 2



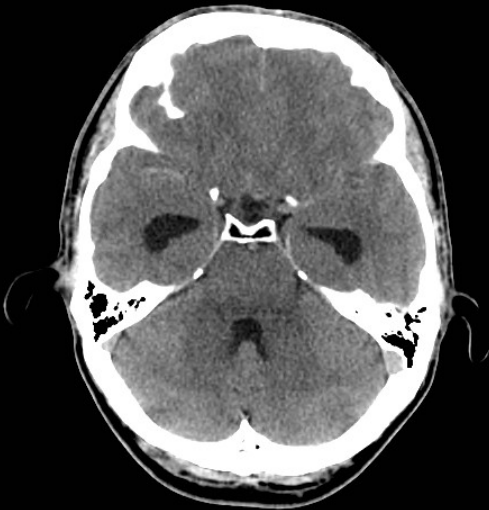
Case 2



Case 3

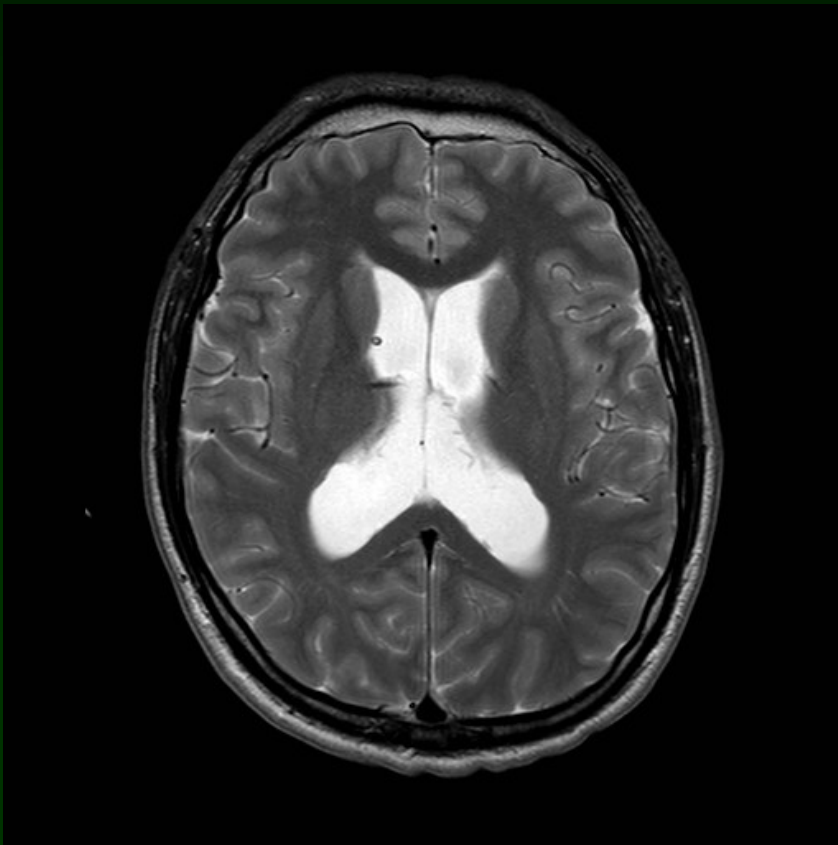
- male, 40-year-old
- sudden onset – headache, nausea, vomiting
- CT exam – hydrocephalus
- ophthalmoscopy – the edges of the optic disc unclearly defined
- psychomotor slowing, dystaxia, no meningeal signs

Case 3



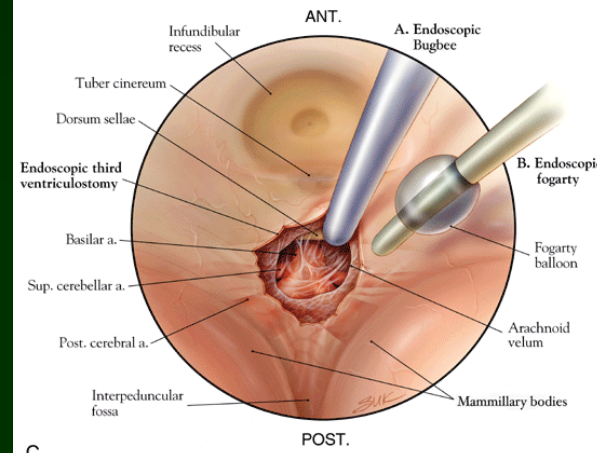
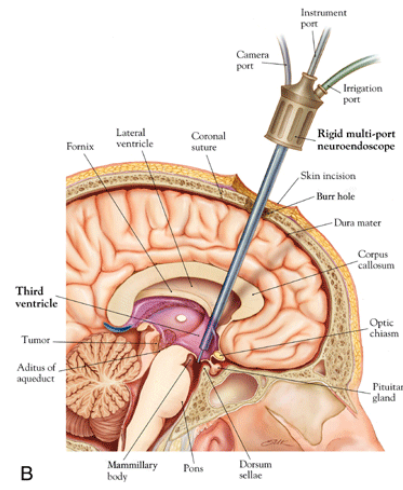
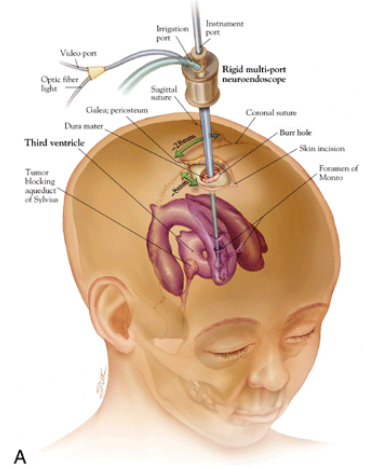
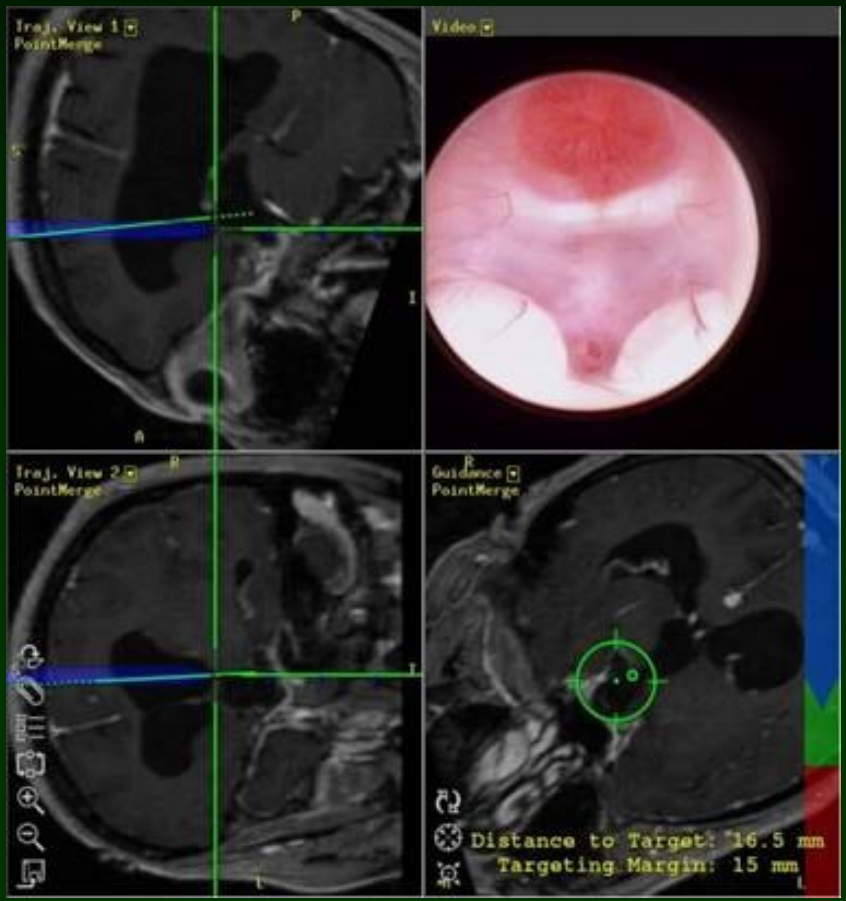
Case 3

- external ventricular drainage
- MRI

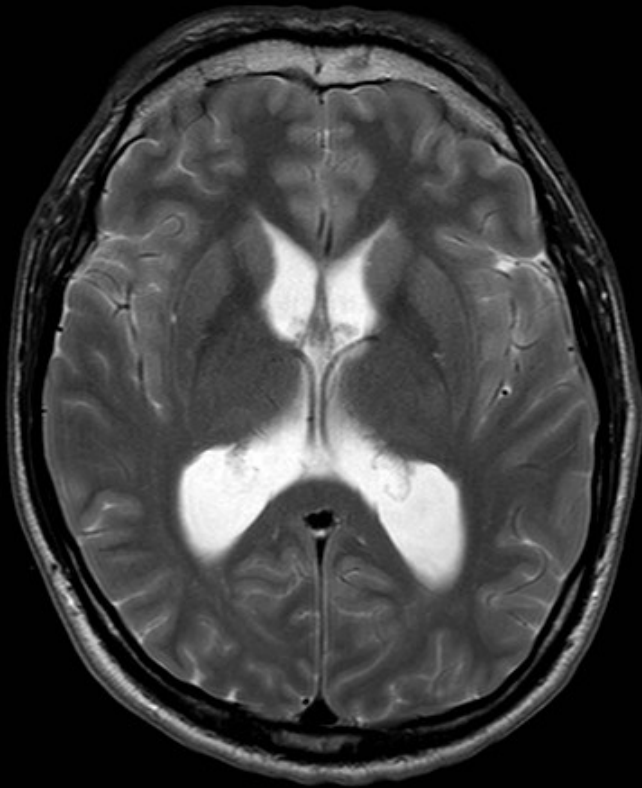


Case 3

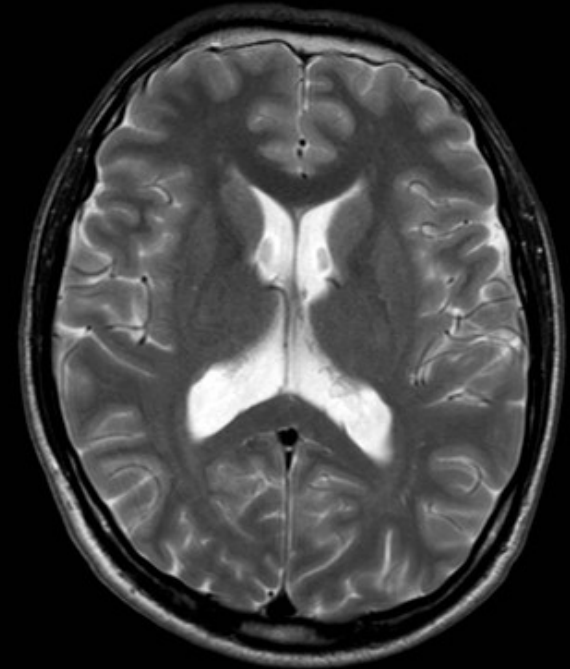
- 3rd ventriculostomy



Case 3

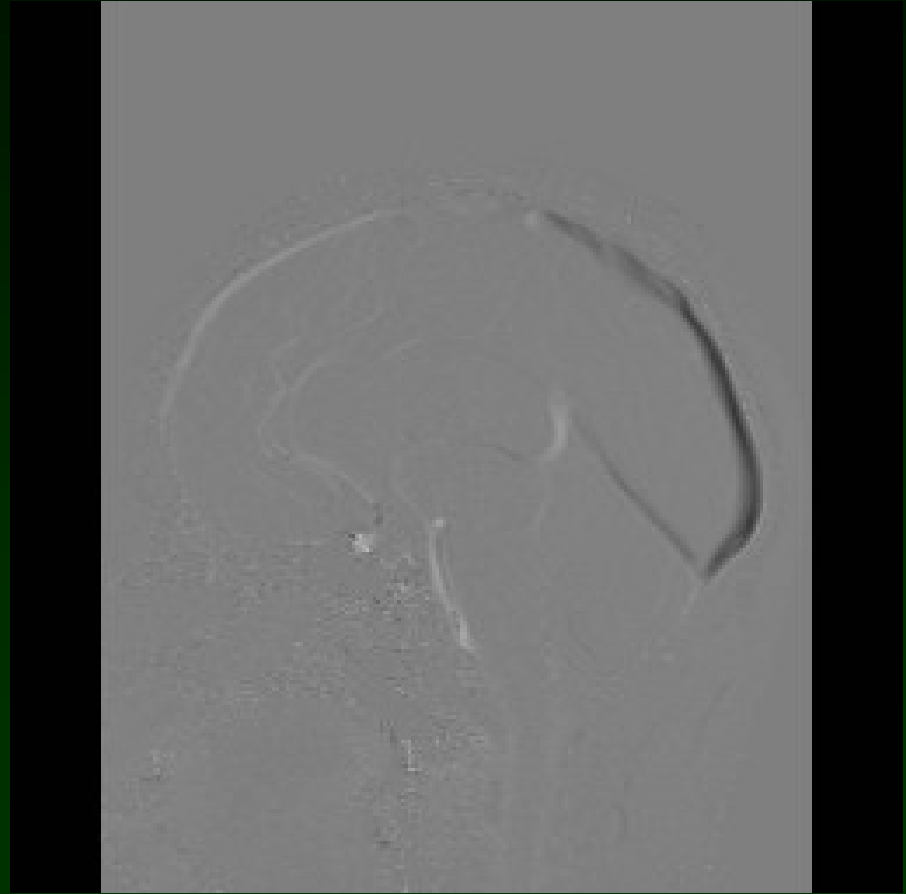


Before OP

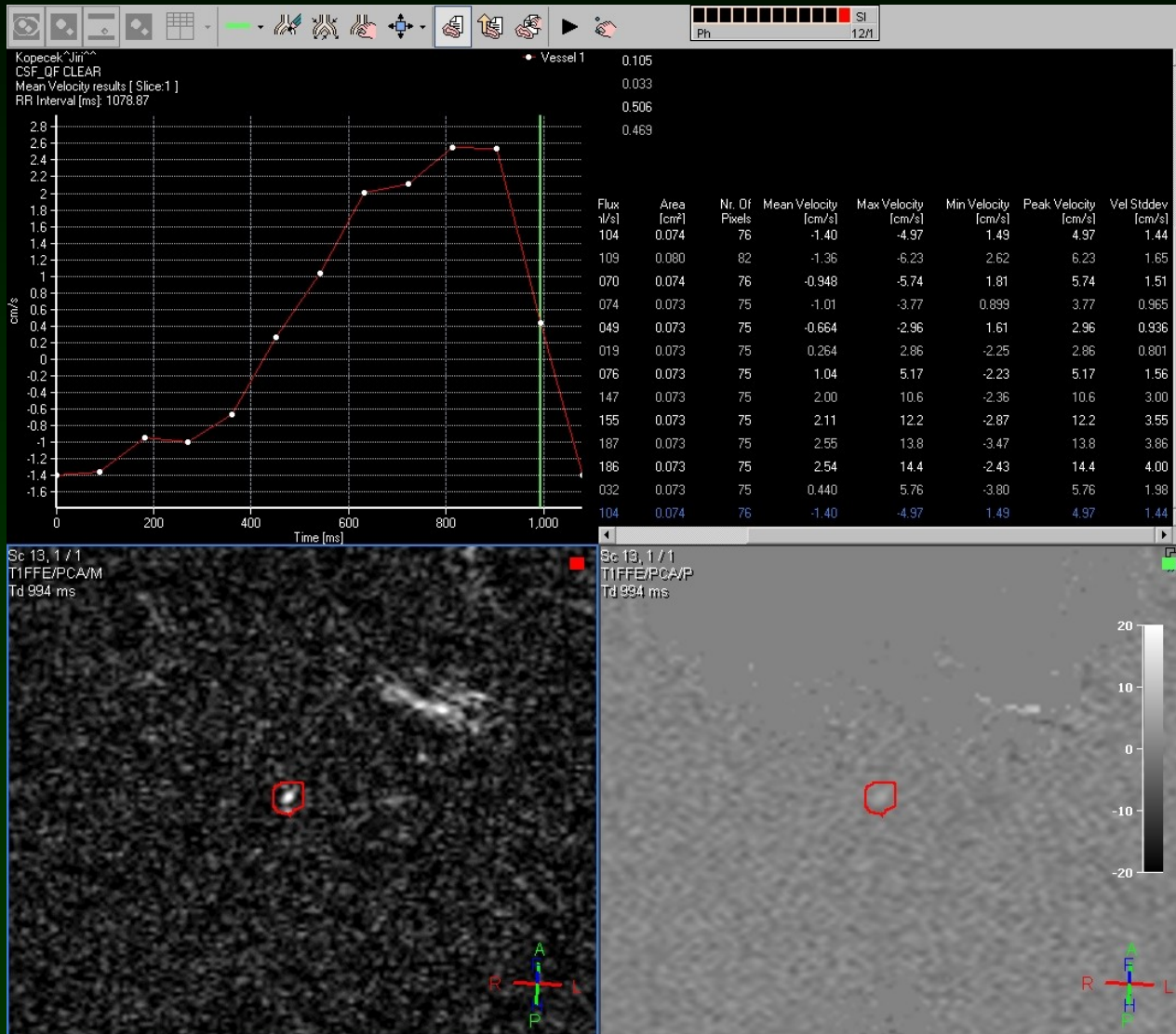


After OP

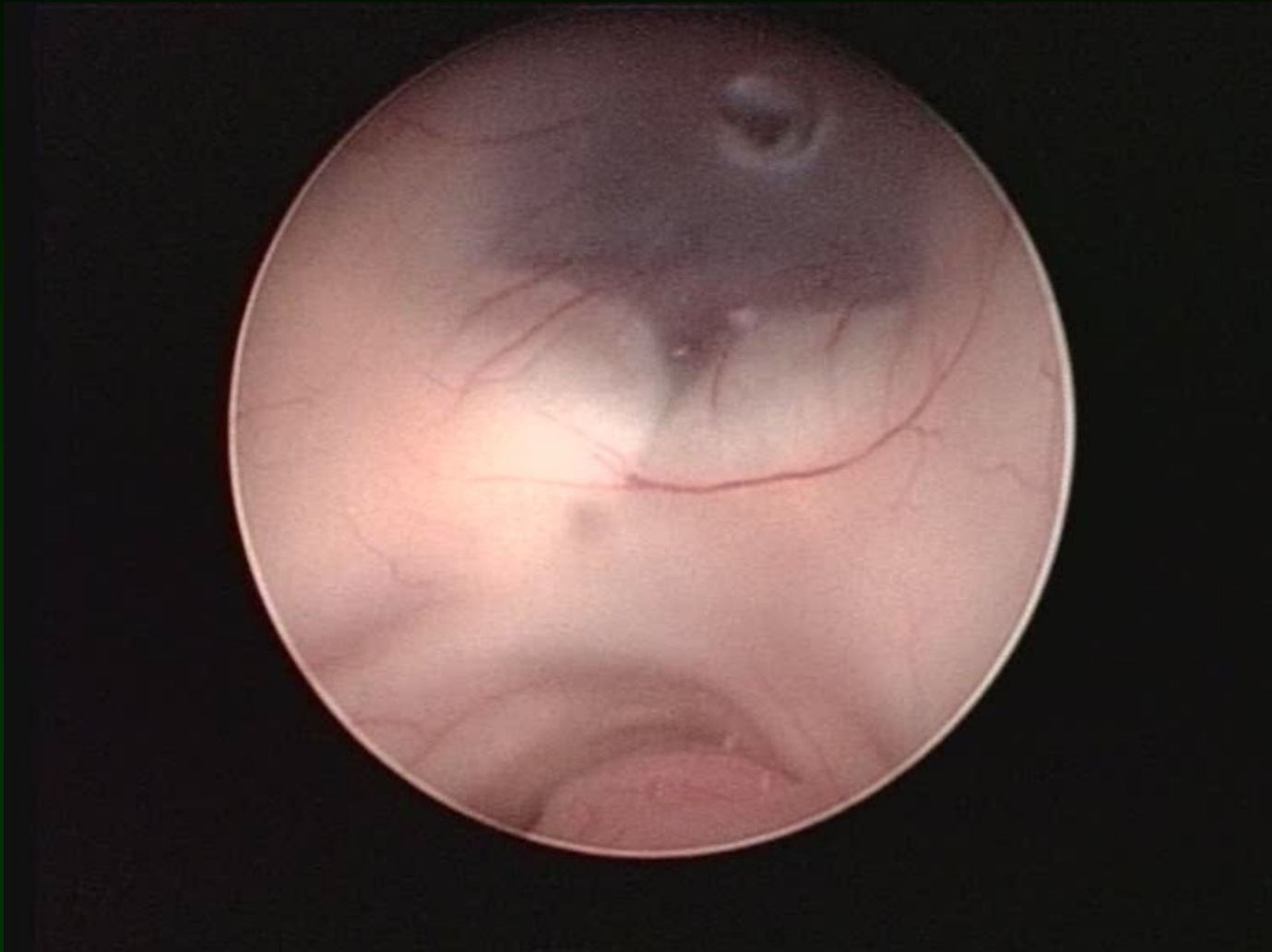
Case 3



Case 3

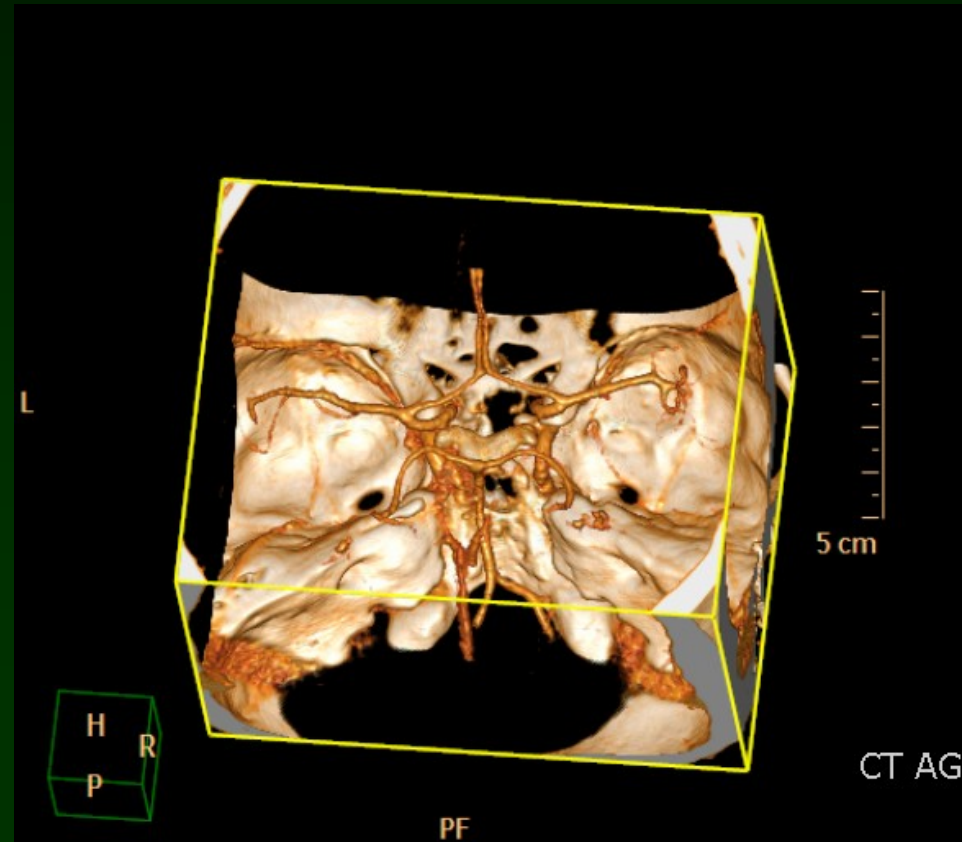
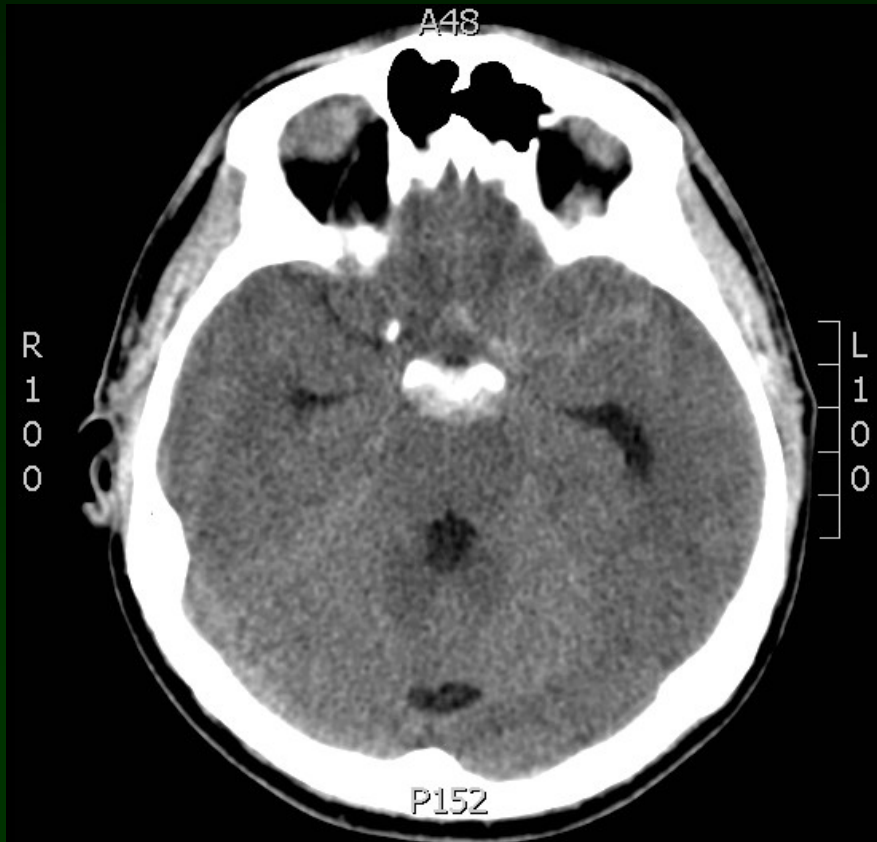


Case 3

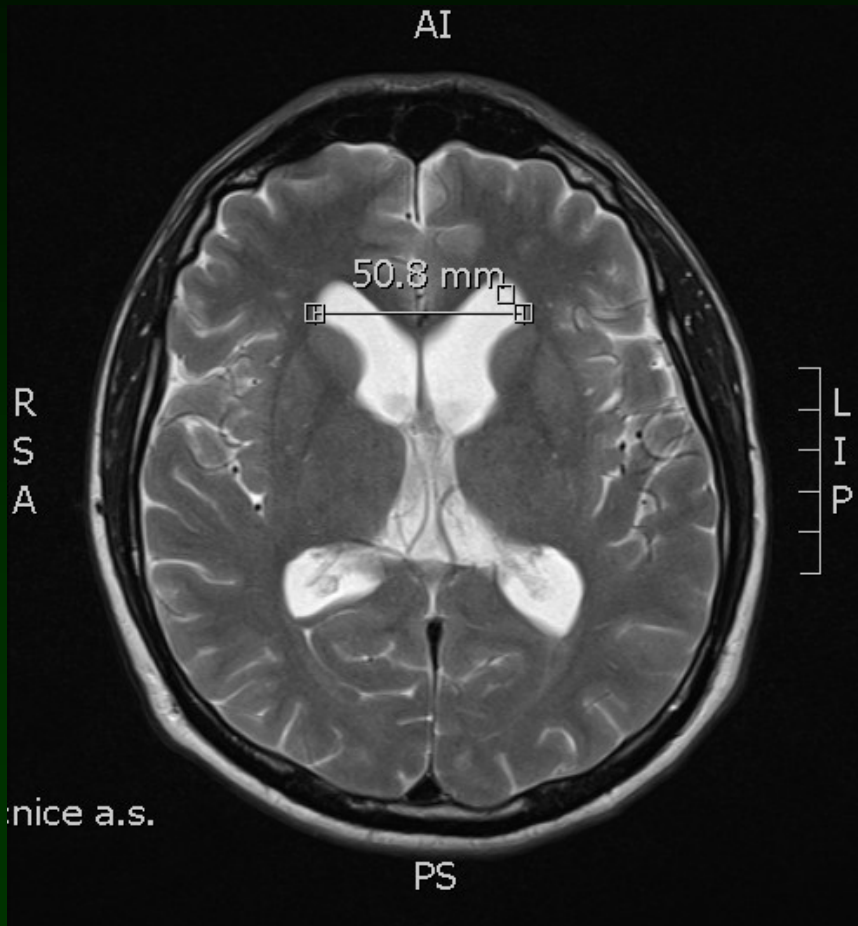


Case 4

- male, 48-year-old, SAH



Case 4



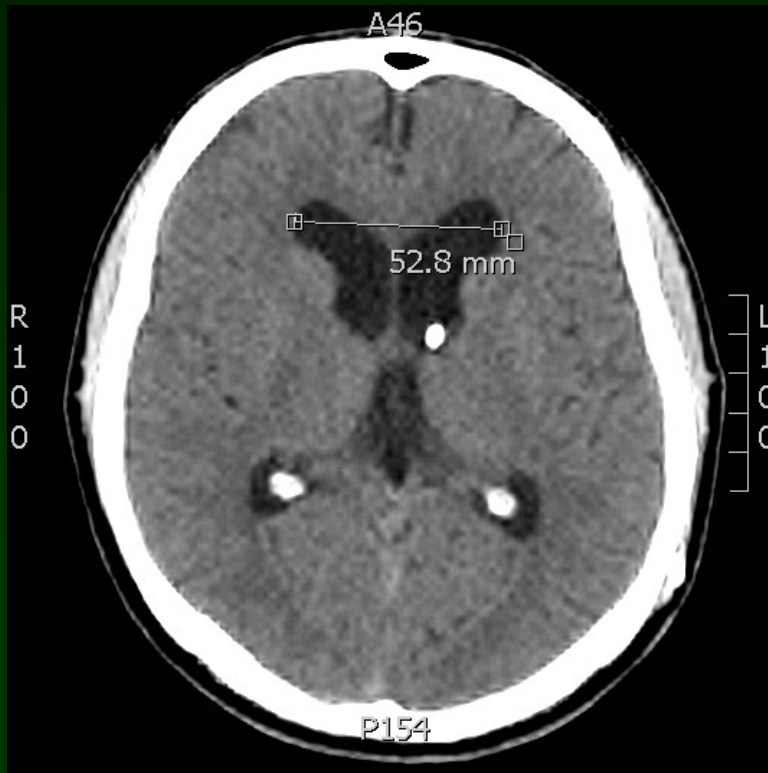
1 month after SAH



5 months after SAH

Case 4

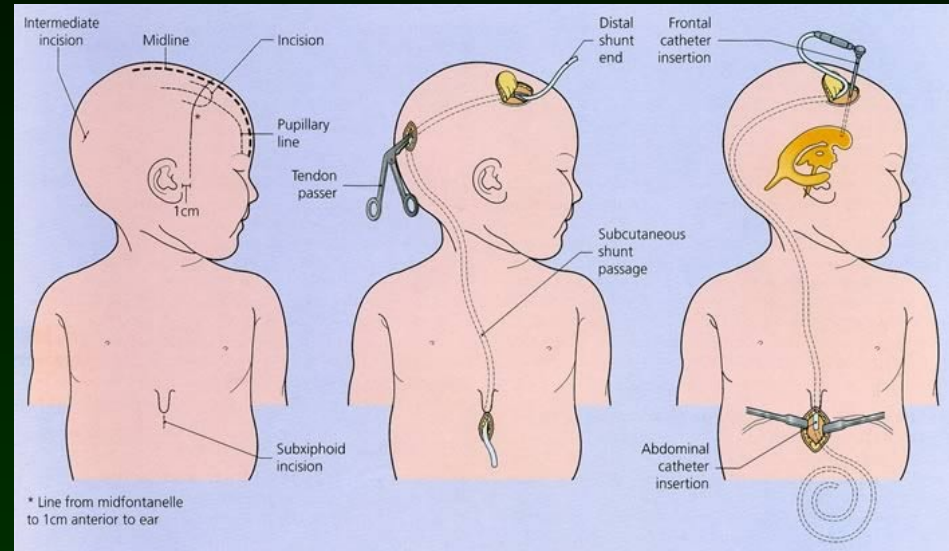
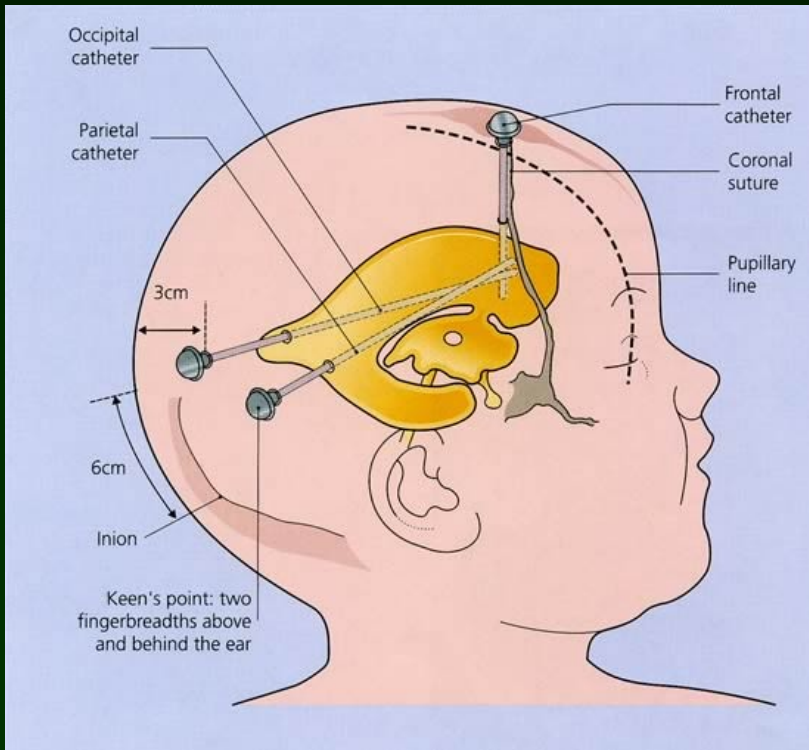
- 5 months after SAH
- headache, memory disorder



4 days after surgery

Case 4

- VP shunt



Case 5

- **female, 55-year-old, SAH, aneurysm BA, coiling**
- **hydrocephalus**
- **implantation of a VP shunt**
- **shunt malfunction – peritoneal catheter**
- **revision – laparoscopy – multiple adhesions**

Case 5



Case 5

- lesser trauma to the abdominal wall and peritoneum
- possibility of performing adhesiolysis and exquisite visualization of the peritoneal cavity, with in situ testing of catheter function
- lower risk of intraabdominal adhesions than laparotomy
- diagnosis of abdominal pain
- revision surgery
- primary placement



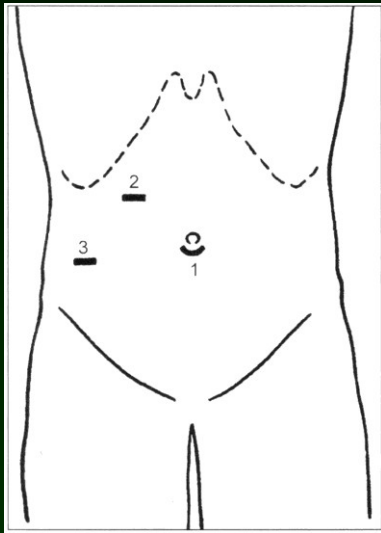
Case 5

- **Laparoscopy is safe even without VP catheter clamping and with only routine anesthetic monitoring (Al-Mufarrej et al, 2005).**
- **Risk of retrograde failfure minimal even with intraabdominal pressure as high as 80 mm Hg (Al-Mufarrej et al, 2005).**

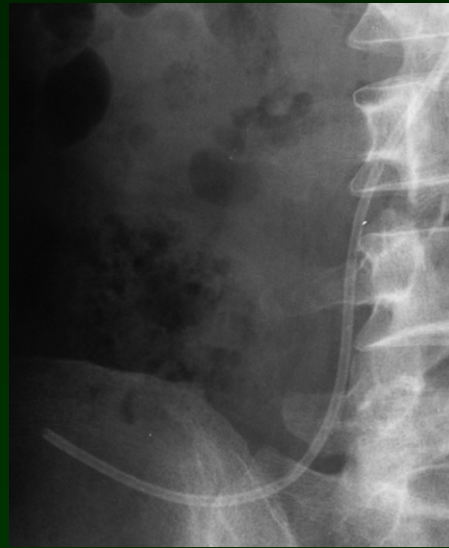


Case 5

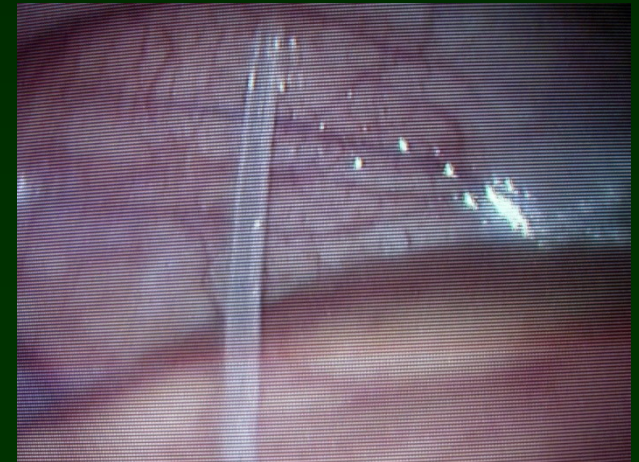
Placement of trocars



X-ray after laparoscopic placement

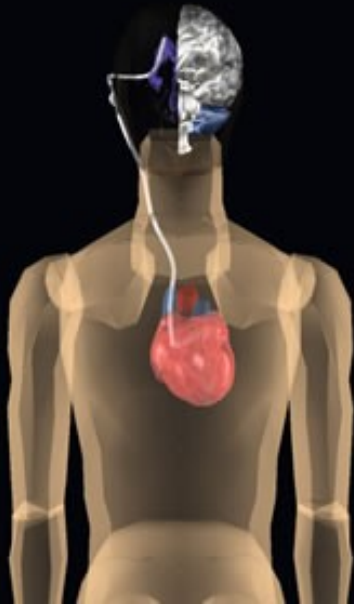


The end of the peritoneal catheter



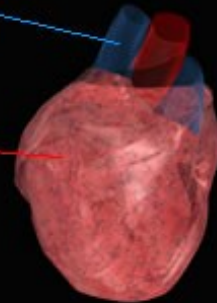
Case 5

- VA shunt



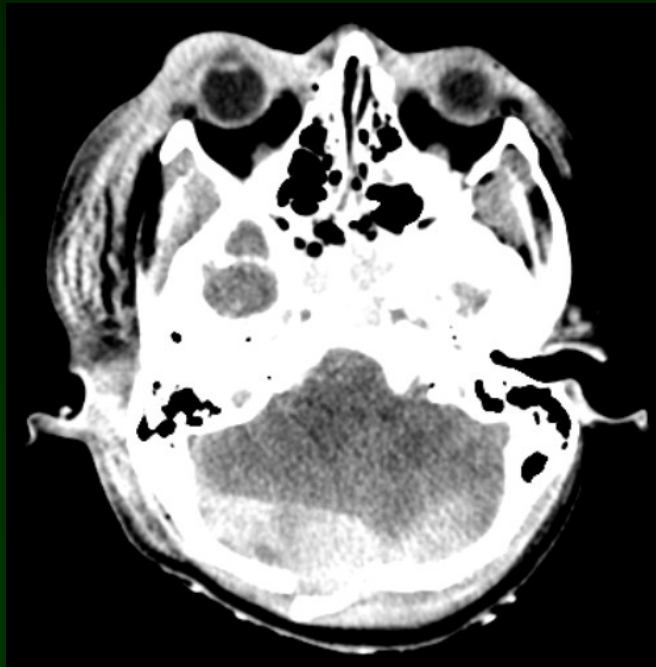
Superior
Vena Cava

Right
Atrium

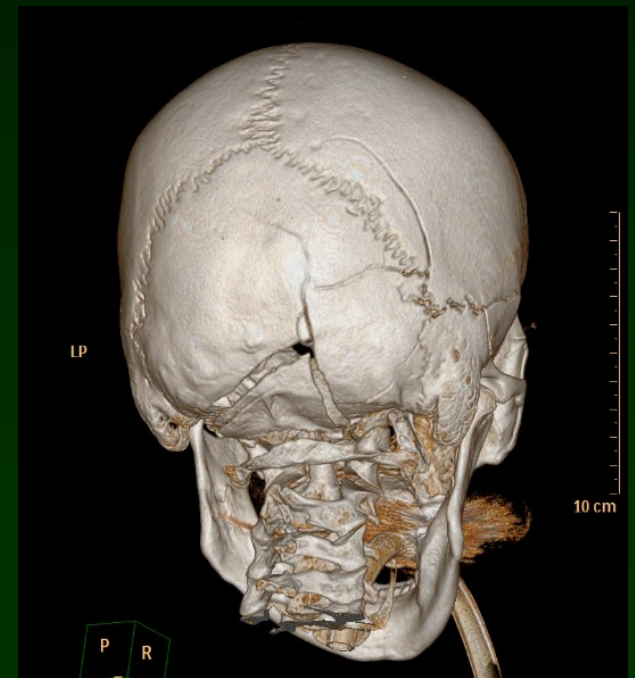


Case 6

- female, 26-year-old
- car accident, TBI, spine injury

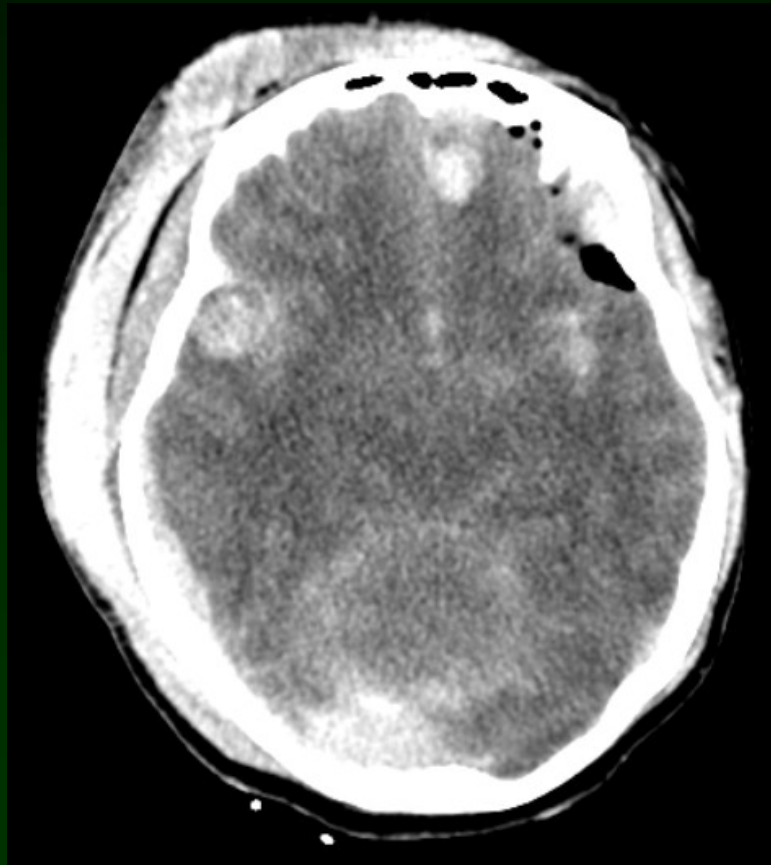


EDH



Occipital bone fracture,
subluxatio C0-1, C1-2

Case 6

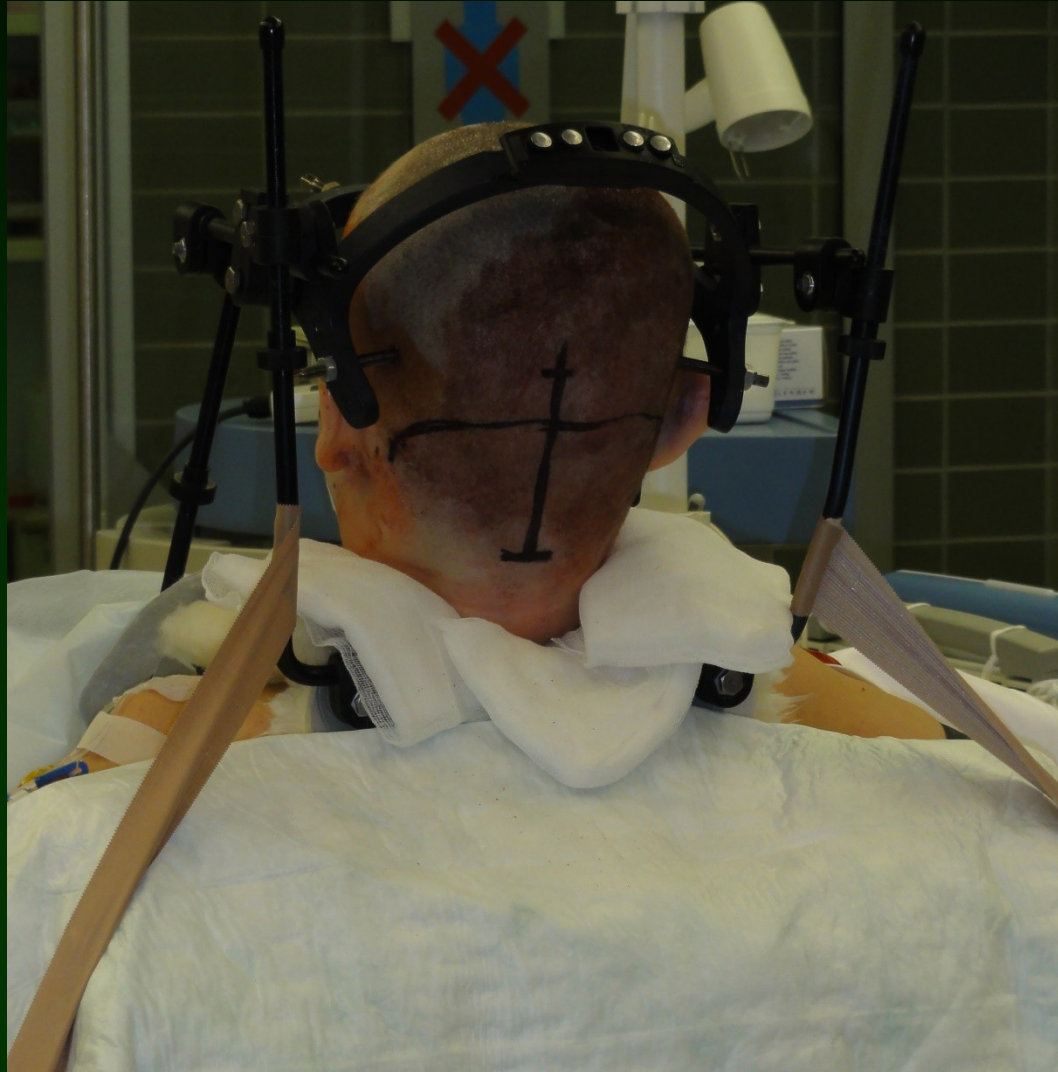


before operation, halo vest

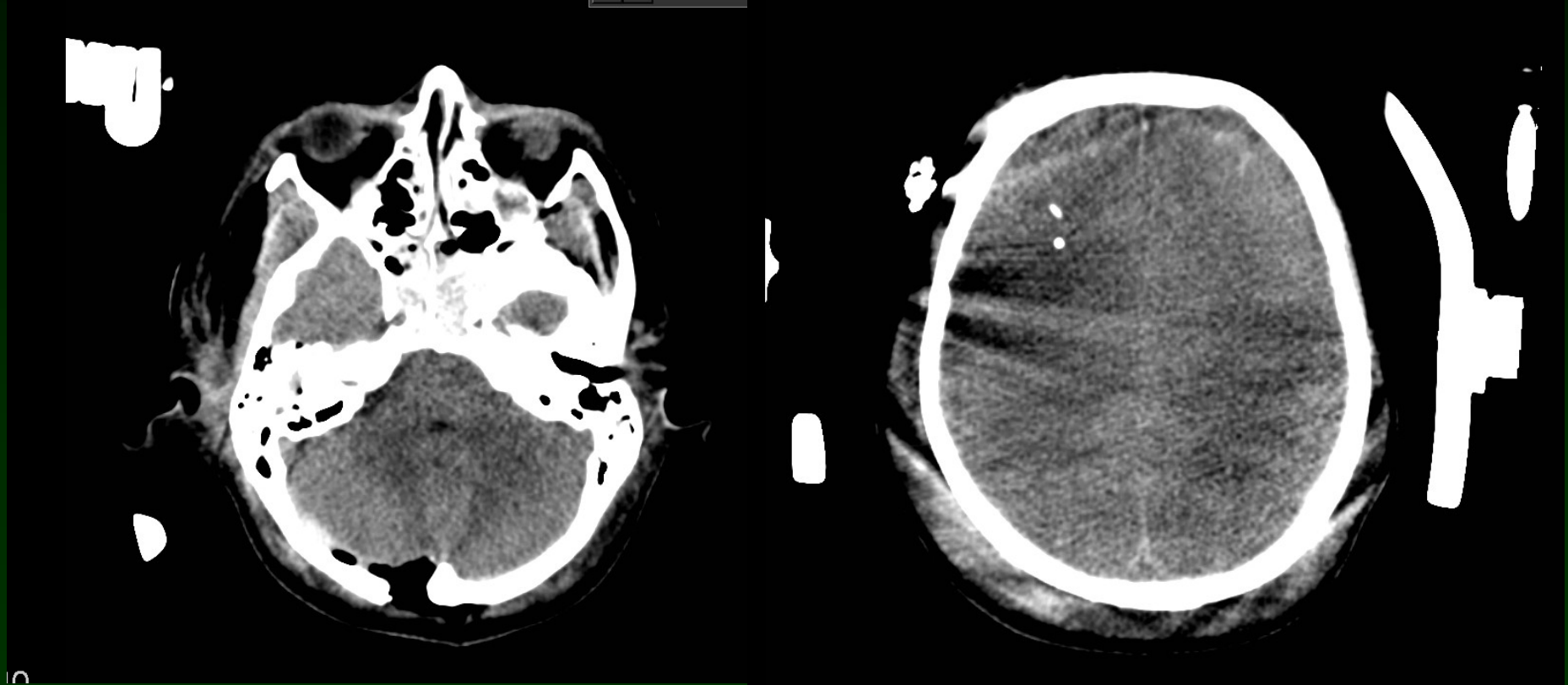
Case 6



Case 6

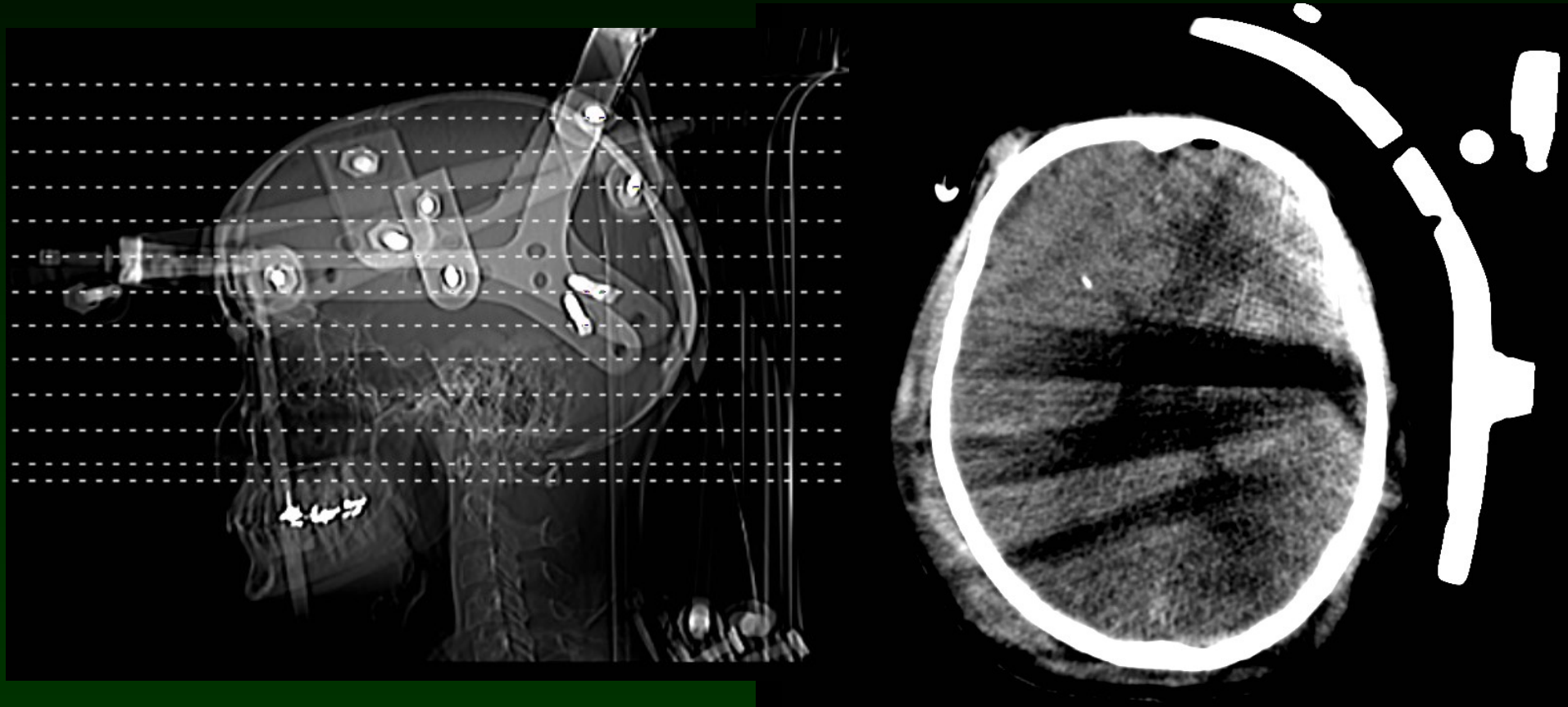


Case 6



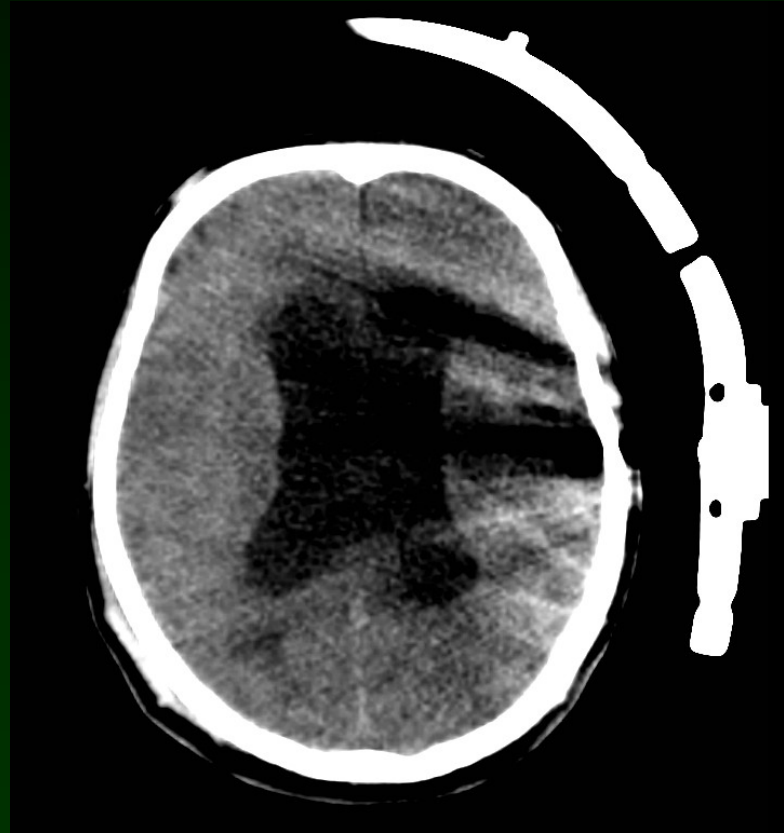
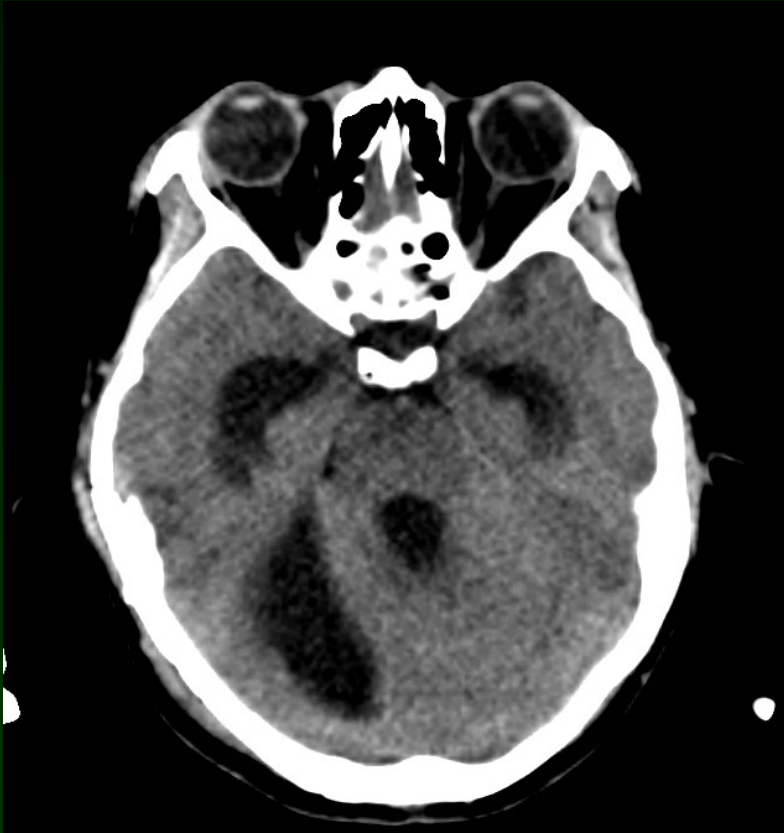
after operation

Case 6



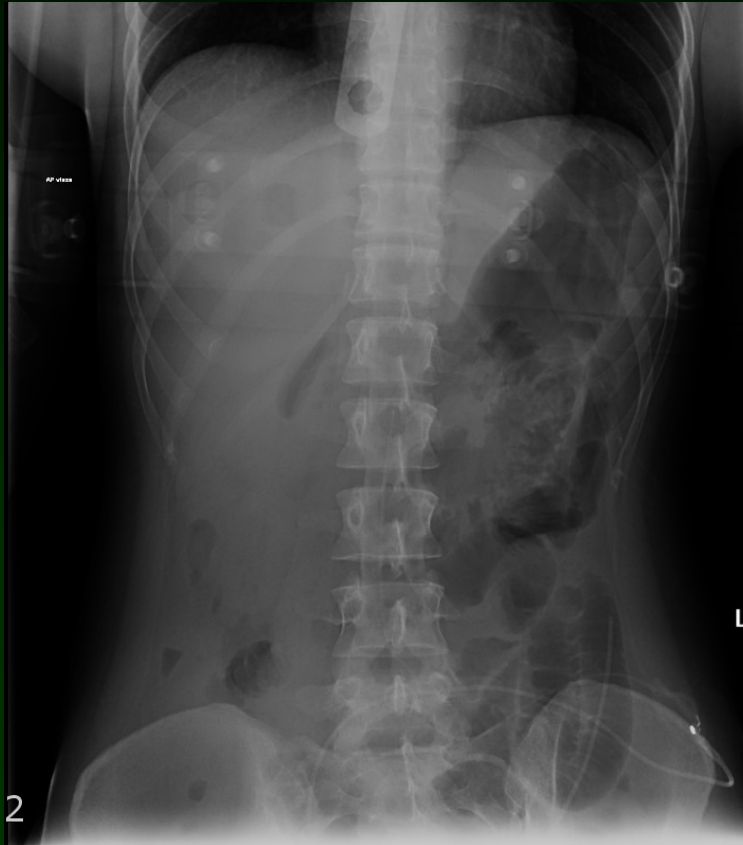
after operation

Case 6



5 weeks later

Case 6



LP shunt

Case 6



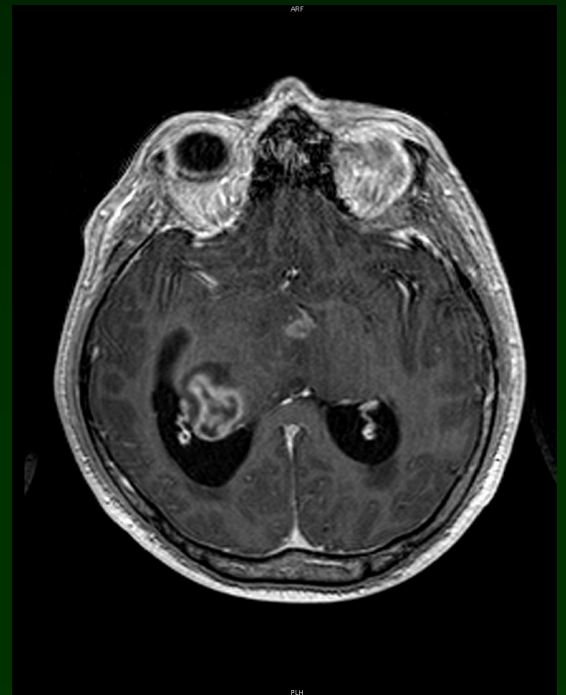
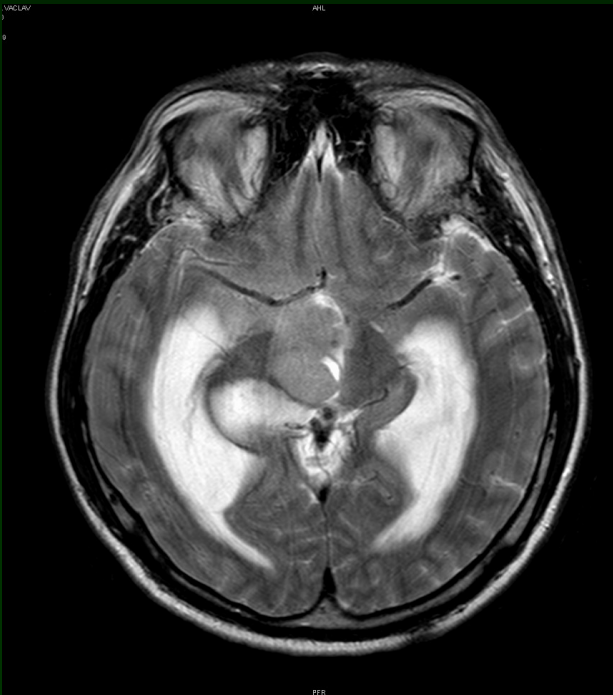
after LP shunt

Case 6



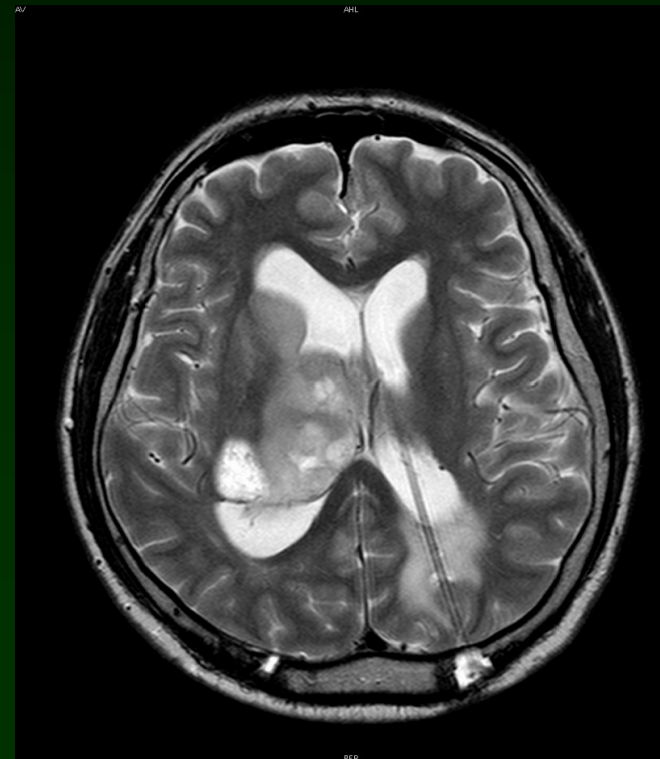
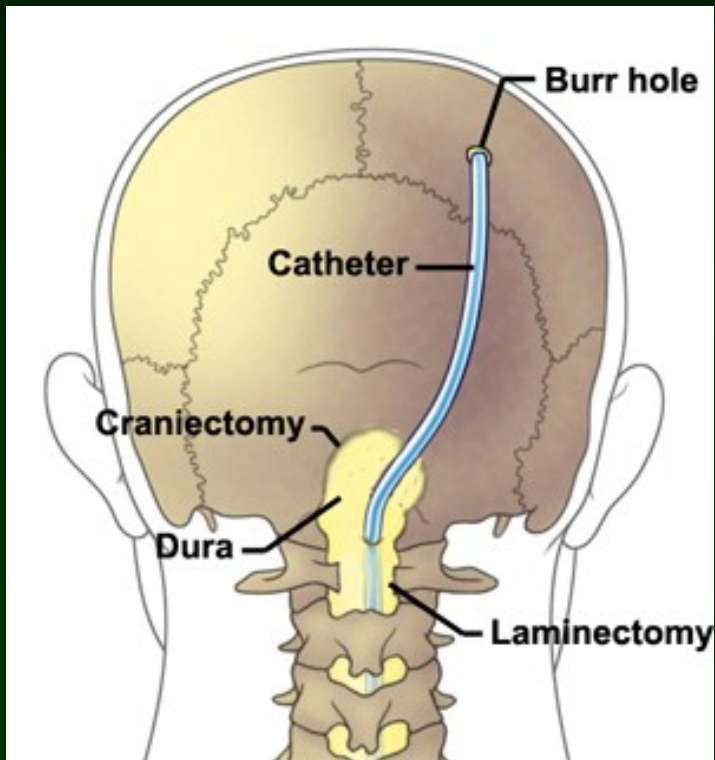
Case 7

- male, 50-year-old
- hydrocephalus
- tumor – biopsy - GBM



Case 7

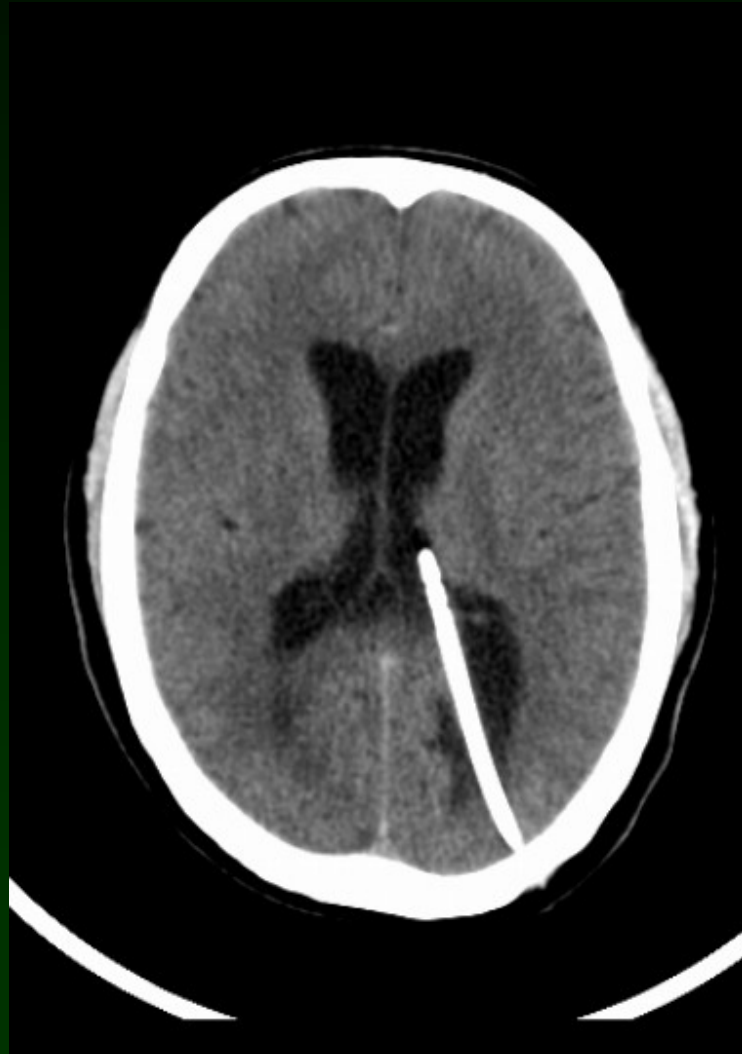
- Torklidsen drainage



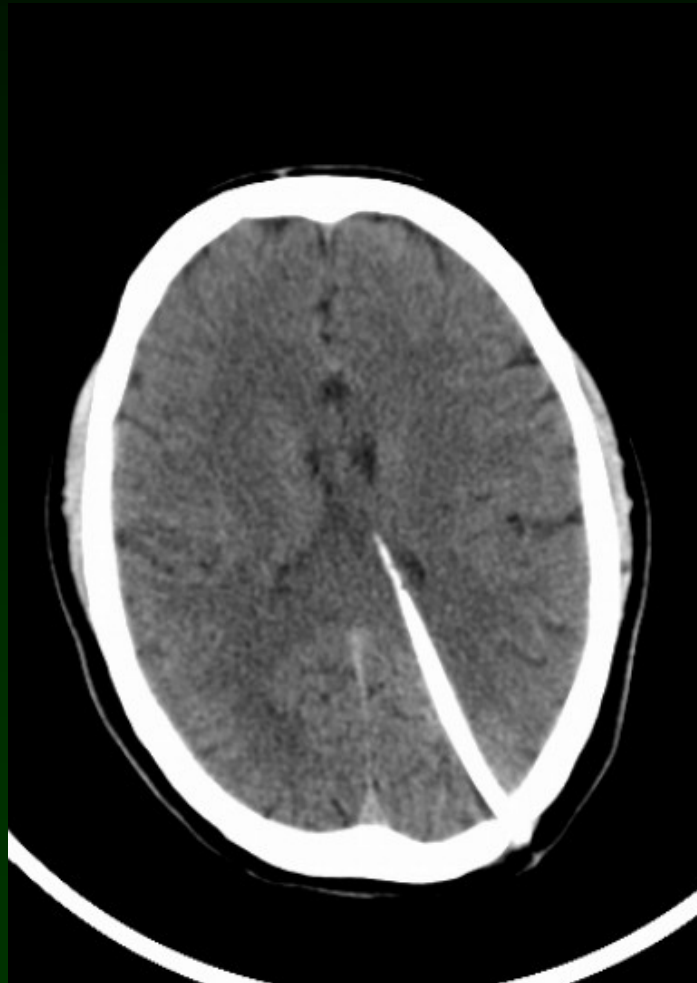
Case 8

- **25-year-old man**
- **shunt – 12-year-old + 4 revisions**
- **shunt malfunction – signs of intracranial hypertension**

Case 8



Case 8



1 year ago

Case 8



Case 9

- **51 years old man, 8.5.2008 – headache, nausea, vomiting**
- **decreased consciousness, confusion, stiff neck**
- **CT exam – subarachnoid hemorrhage, acute hydrocephalus, DSA negative**
- **external ventricular drainage**

Case 9



Case 9

- **Second DSA - negative**
- **19.6.2008 – implantation of a V-P shunt**
- **22.6.2008 – sepsis, meningitis, explanation of the V-P shunt, EVD**
- **Bacteriology negative, virology negative.**

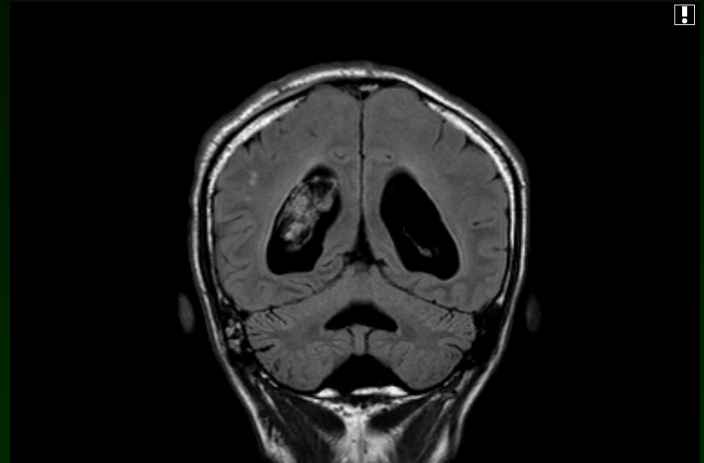
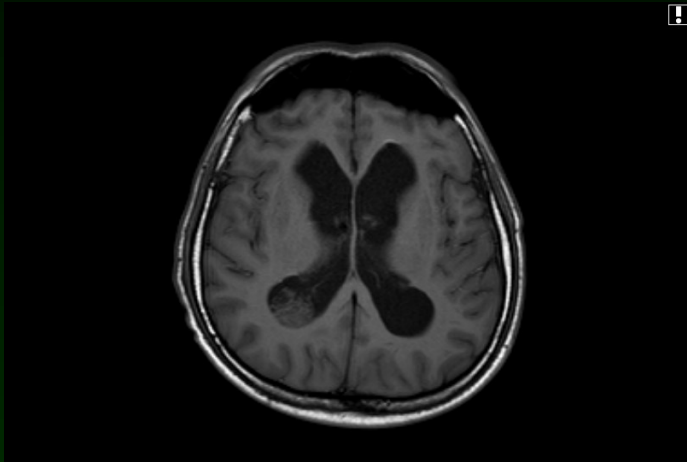


Case 9

- 4.7.2008 rebleeding, IVH.



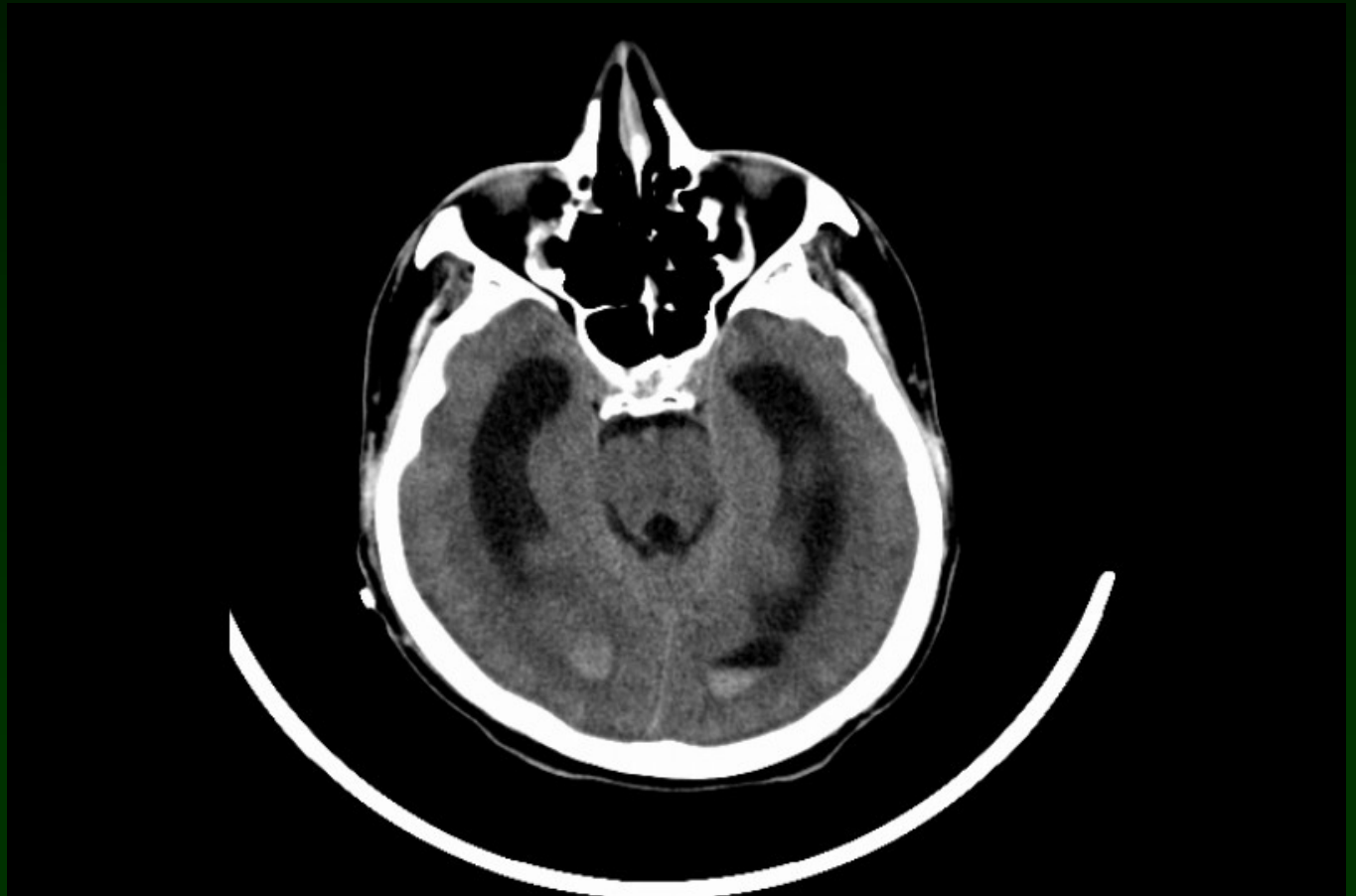
Case 9



MRI 8.8.2008

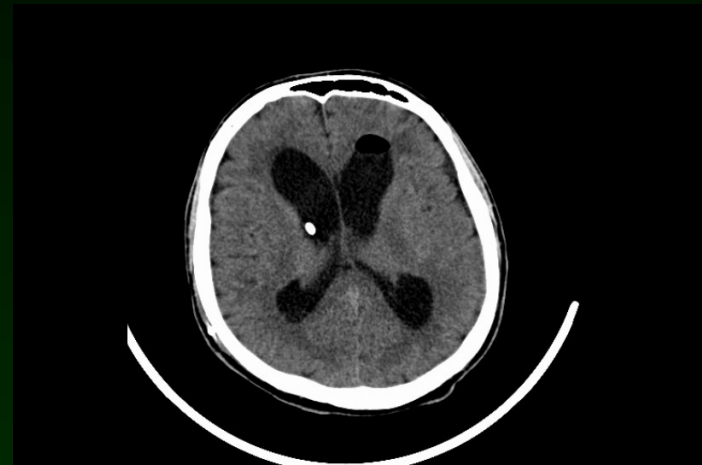
Case 9

- Rebleeding 17.8.2008



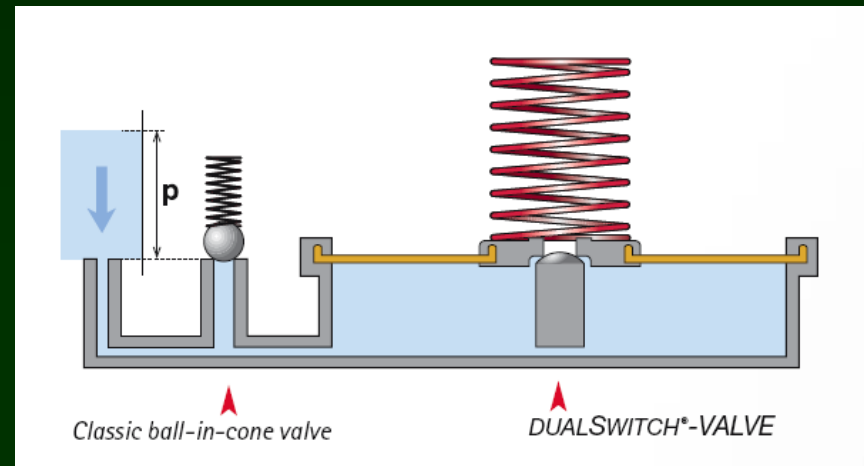
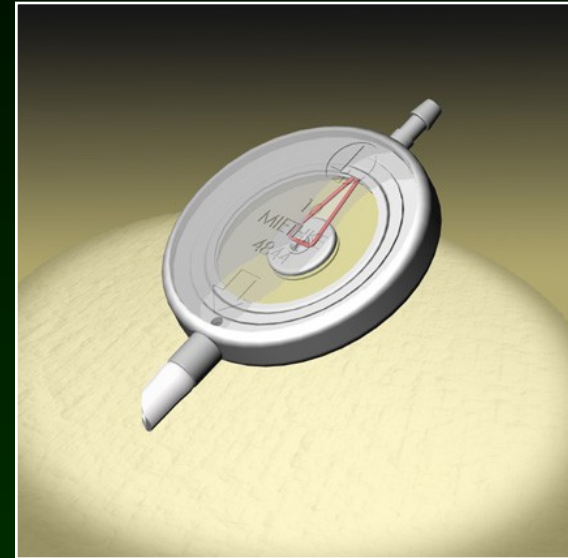
Case 9

- 28.8.2008
Monostep 10
- 3/2009
returned to work
- businessman
- only slight organic
syndrome



Case 9

- Monostep/Dualswitch
- a very large surface area to the CSF (overdrainage)
- mechanism effectively immune against any of the problems associated with proteins or blood



Case 9

