

Ventriculoperitoneal Shunt Malfunction in a Complex Parturient

Wang A, Yanik M, Martin E, and Weinstein L



Background Information:

- **Hydrocephalus** is a disorder that results in abnormal buildup of CSF within the ventricles of the brain
 - Etiologies:
 - Obstruction (most common cause)
 - Decrease absorption of CSF
 - Increase production of CSF
 - If untreated, can lead to brain damage, mental impairment, and death
- **Management:**
 - Ventricular shunts are commonly used to treat hydrocephalus.
 - Ventriculo-peritoneal shunt (VP)
 - Ventriculo-atrial shunt
 - Ventriculo-pleural shunt
 - Endoscopic third ventriculostomy (ETV)
- VP shunt malfunction during pregnancy:
 - Occur up to 50%
 - Highest incidence: During the third trimester
 - Mechanism:
 - Increase intraabdominal pressure
 - Gravid uterus compression of the VP catheter
 - Symptoms are related to increase intracranial pressure
 - Headache, nausea, and vomiting (most common)
 - Altered mental status, cerebral edema, visual disturbances, and cerebral-tonsillar herniation

Understanding:

- Consensus is a multidisciplinary team approach
- No consensus on the mode of delivery and the anesthetic approach:
 - Neuraxial anesthesia safe or unsafe?
 - Vaginal delivery versus cesarean delivery?

Aim:

- We present an approach to the management of a complex parturient with acute hydrocephalus

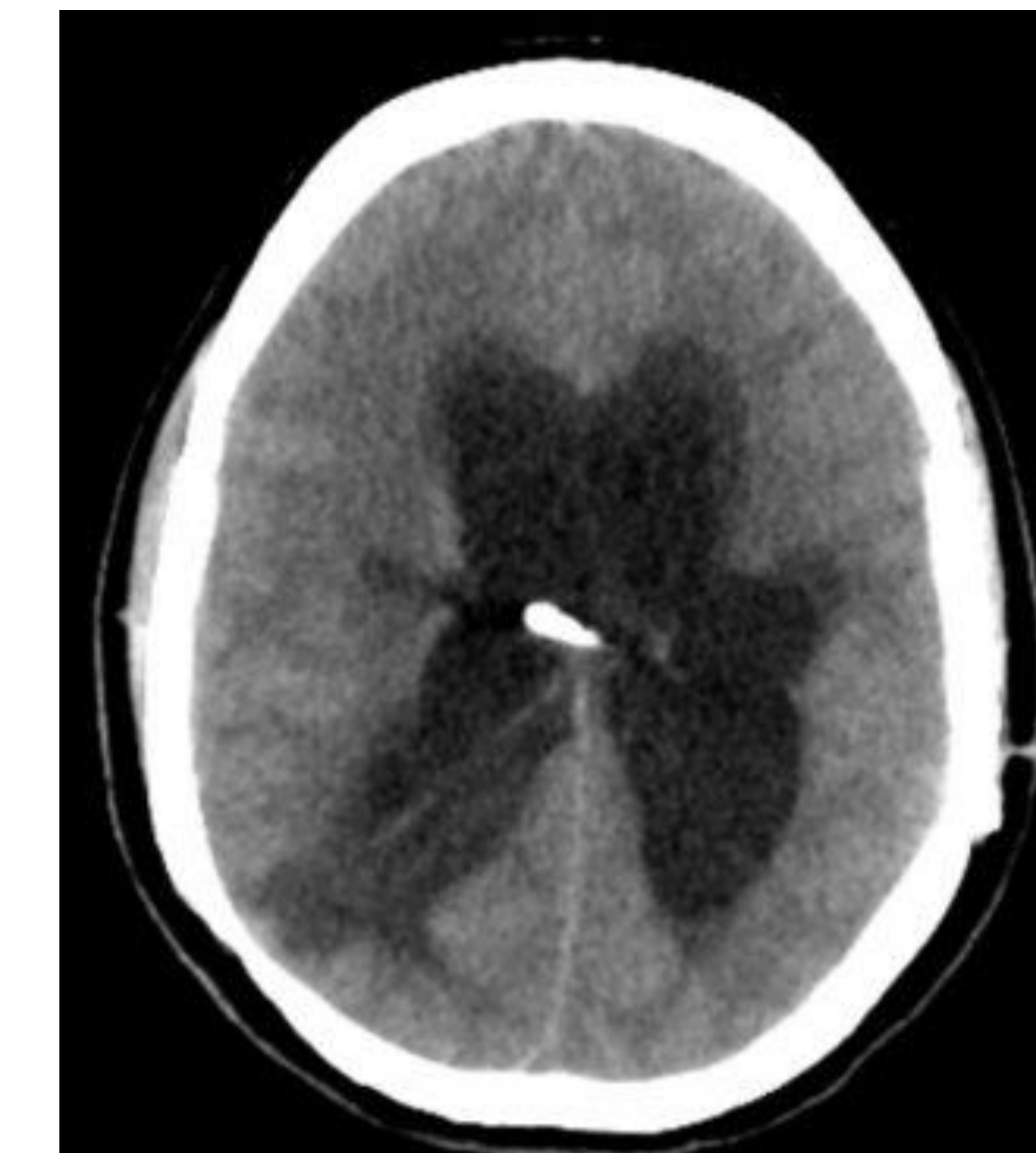
Ventriculoperitoneal Shunt Malfunction in a Complex Parturient

Wang A, Yanik M, Martin E, and Weinstein L

Case:

- 41 yrs. old G1P0 at 30 weeks of gestation with monochorionic-diamniotic twins presented with headache, nausea, and vomiting with acute worsening of her mental status
- PMH includes neonatal intracranial hemorrhage requiring a VP shunt, cerebral palsy, chronic hypertension, pulmonary dysplasia, asthma, malignant hyperthermia, and scoliosis
- CT head demonstrated acute hydrocephalus concerning for VP shunt malfunction
- Emergent shunt tap was performed with immediate improvement of her symptoms
- Patient was admitted to the intensive care unit where her VP shunt was externalized and attached to an external ventricular drain (EVD)
 - VP shunt malfunction was thought to be due to the increased intrabdominal pressure from the gravid uterus preventing appropriate CSF flow.
- A multidisciplinary meeting was held regarding the management of the complex parturient:
 - Major concerns:
 - Prolonged exposure of the VP shunt and the infection risk
 - The ability for the parturient to tolerate labor
 - Primary mode of anesthesia and the safety of neuraxial anesthesia
 - Malignant hyperthermia precautions
 - A cesarean delivery was planned to occur at 32 weeks and 4 days of gestation

Fig 1: CT-head: acute hydrocephalus:
Left image: transverse view
Right image: Coronal view



Ventriculoperitoneal Shunt Malfunction in a Complex Parturient

Wang A, Yanik M, Martin E, and Weinstein L

Intraoperative course:

- MH precautions were implemented
- A combined spinal epidural was performed at L2-L3 level
- Uncomplicated lower transverse cesarean delivery and salpingectomy occurred
- Delivery of both twins, twin A was 1280 grams with APGAR 8 and 9 and twin B was 1890 grams with APGAR 7 and 9.
 - Both neonates were brought to the neonatal ICU for prematurity.
- The patient was transported from the operating room directly to the neuro-ICU

Postoperative course:

- The patient underwent a VP shunt revision on postpartum day 7
- Both neonates were discharged home after several weeks
- Postpartum neurosurgery follow-up and a repeated head CT demonstrated resolution of her hydrocephalus

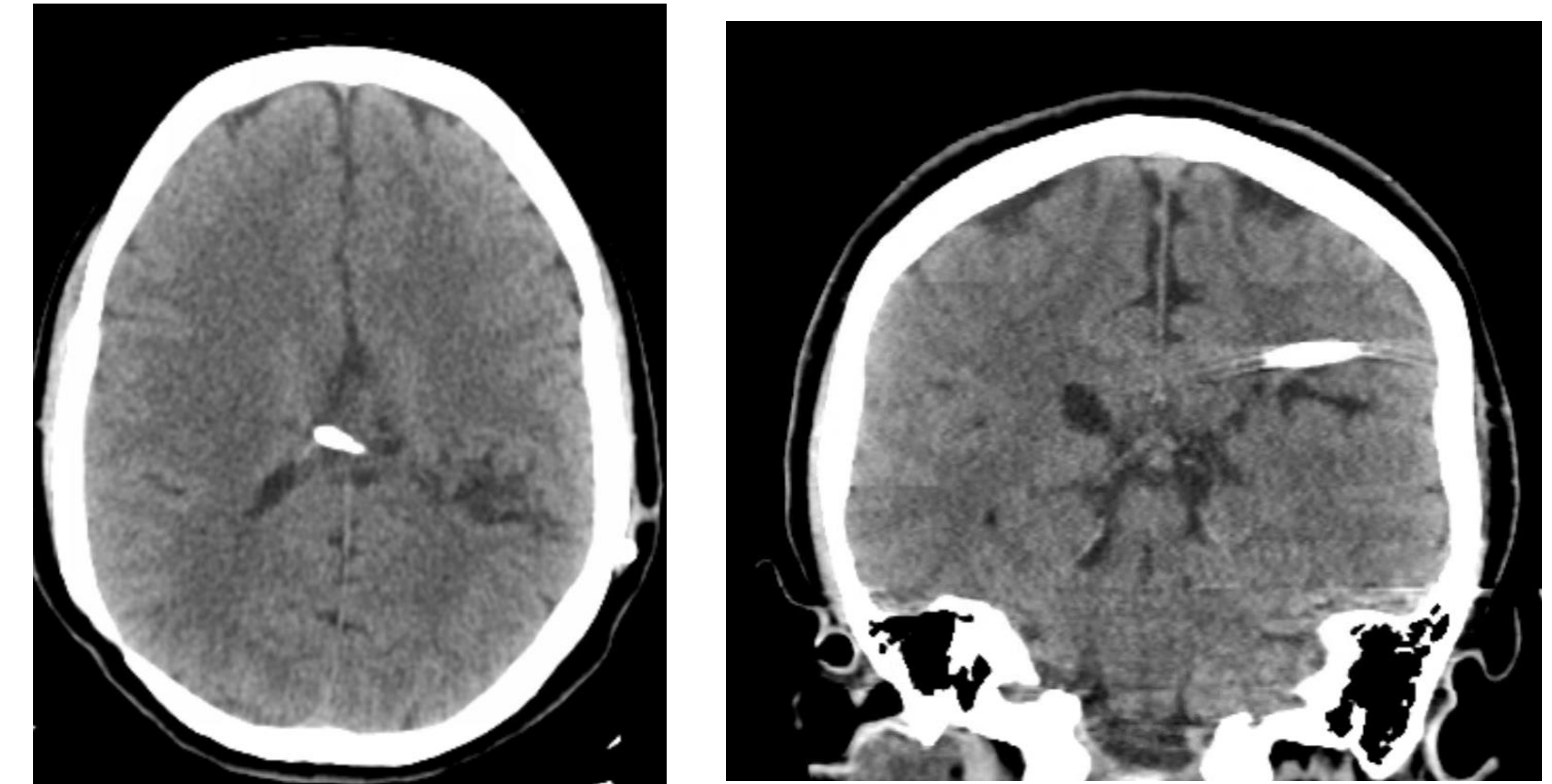


Fig 2: CT-head: Resolution of the hydrocephalus:
Left image: transverse view
Right image: Coronal view

Highlights:

- Importance of a multidisciplinary approach in the management of a complex parturient

References:

- D;, Schiza S;Stamatakis E;Panagopoulou A;Valsamidis. “Management of Pregnancy and Delivery of a Patient with Malfunctioning Ventriculoperitoneal Shunt.” *Journal of Obstetrics and Gynaecology : the Journal of the Institute of Obstetrics and Gynaecology, U.S.* National Library of Medicine
- M;, Cusimano MD;Meffe FM;Gentili F;Sermer. “Ventriculoperitoneal Shunt Malfunction during Pregnancy.” *Neurosurgery, U.S.* National Library of Medicine, Dec. 1990