

Navigating High-Risk Obstetrics: General Anesthesia for a Post-Craniotomy Patient

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Introduction

- **Anesthetic Challenges in High-Risk Obstetrics with Neurological Histories:** Managing pregnant patients with complex neurological conditions presents significant anesthetic challenges.
- **Risks Associated with Cavernous Hemangiomas:** Cavernous hemangiomas can lead to severe complications like hemorrhage and obstructive hydrocephalus, often requiring emergency surgical interventions [1,2].
- **Considerations for Patients with Prior Craniotomies and Ventricular Shunts:** Such patients require meticulous planning to optimize maternal and fetal outcomes during pregnancy and delivery.
- **Debate on Anesthetic Technique for Cesarean Deliveries:** While regional anesthesia is common, general anesthesia may be preferable in patients with significant neurosurgical histories to better control intracranial pressure and avoid exacerbating neurological conditions [3].
- **Purpose of the Case Report:** This case illustrates the successful anesthetic management of a high-risk obstetric patient with a significant neurosurgical history via collaboration.

Figure 1

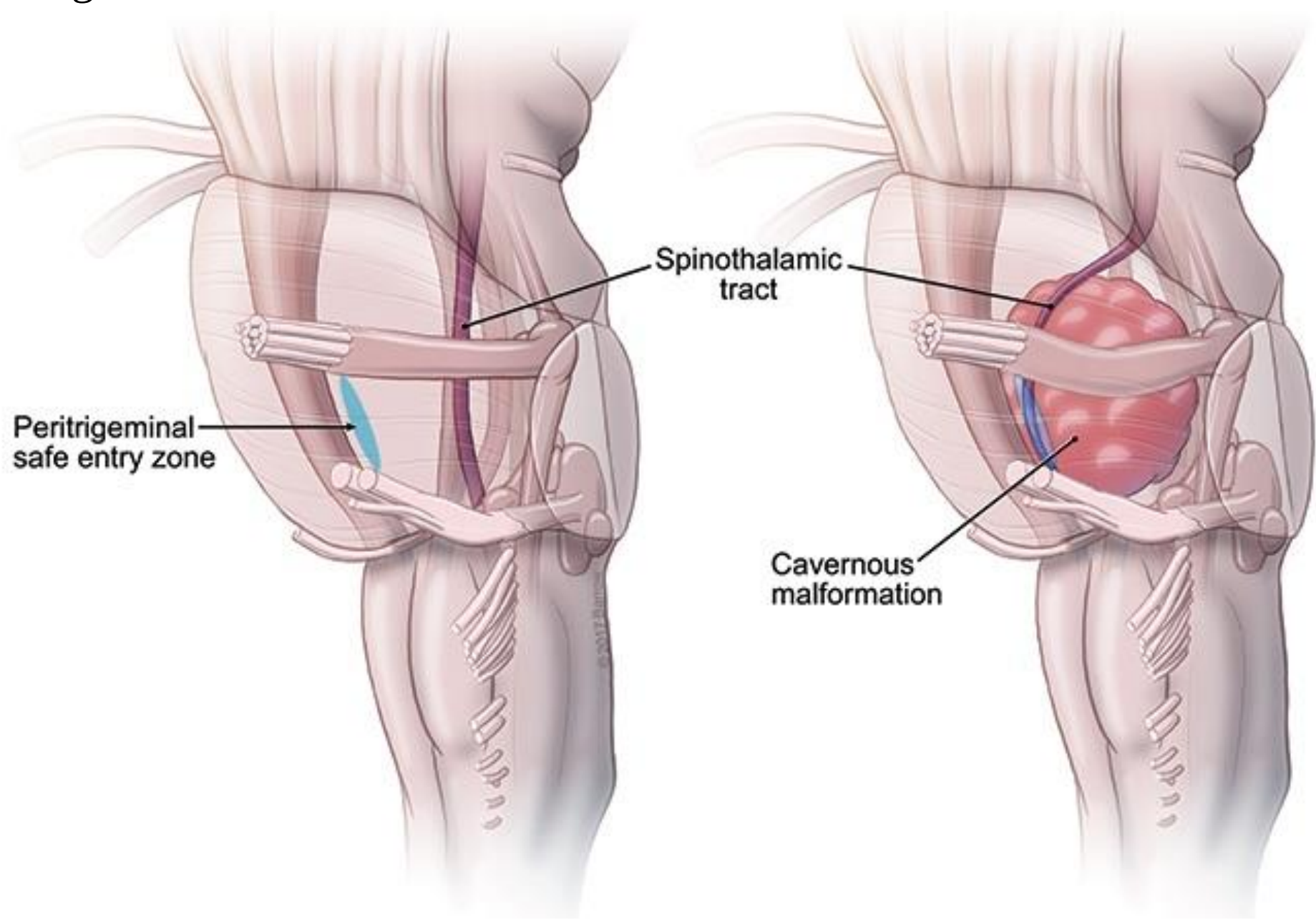


Figure 1. Description: The illustration shows a normal brainstem (left) and a brainstem with a cavernous hemangioma (right), displacing the spinothalamic tract, which relays pain, temperature, and touch. This displacement explains the patient's neurological deficits and underscores the complexity of anesthetic management in such cases.

"Cavernous Malformation," Barrow Neurological Institute, 2024.

Figure 2

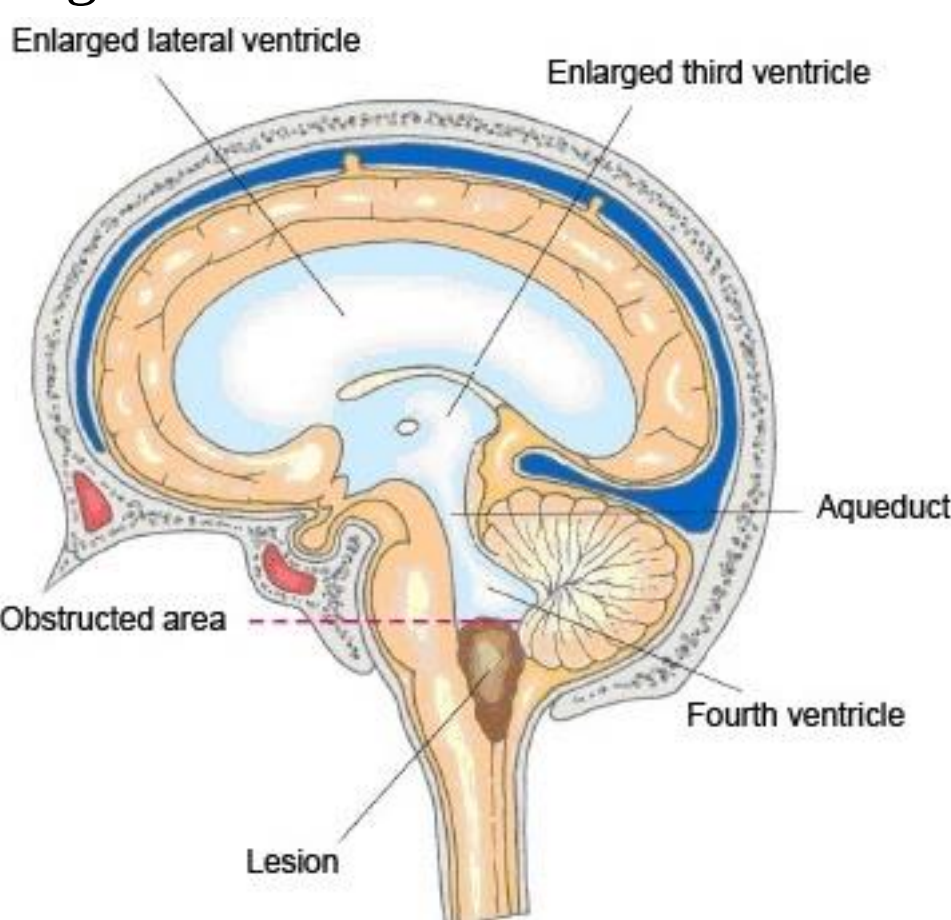


Figure 2. Description: The image shows obstructive hydrocephalus with enlargement of the lateral, third, and fourth ventricles due to a blockage distal to the fourth ventricle, disrupting cerebrospinal fluid flow and raising intracranial pressure. "Obstructive Hydrocephalus," Pacific Neuroscience Institute, 2024.

Case Description

- **Patient Profile:** 31-year-old female, G4P1021, with a history of postpartum brainstem hemorrhage due to cavernous hemangioma and obstructive hydrocephalus.
- **Neurological History:** Following a prior pregnancy in 2020, she experienced an acute intracranial bleed, underwent emergent craniotomy and cavernous hemangioma resection, followed by occipital ventriculoperitoneal (VP) shunt placement.
- **Current Pregnancy Presentation:** Scheduled for cesarean delivery due to her neurosurgical history.
- **Imaging Findings:** Planned repeat MRI imaging was not completed before delivery; prior imaging was from before the VP shunt placement.
- **Preoperative Neurological Examination:** Exhibited right hemifacial weakness, right eye lagophthalmos, right cranial nerve VI palsy, left lower extremity focal weakness, balance difficulties, numbness, tingling, dizziness, and speech changes.
- **Anesthetic Plan:** Following multidisciplinary discussion, general anesthesia was chosen over regional anesthesia due to unavailability of updated imaging studies for neuroprotection.
- **Anesthetic Management:** Induction with 200 mg propofol and 100 mg rocuronium; intubation via video laryngoscopy with a 6.5 mm endotracheal tube. Administered 1.1% sevoflurane and 50% nitrous oxide prior to fetal delivery.
- **Intraoperative Monitoring and Outcomes:** Patient was closely monitored for signs of increased intracranial pressure or neurological deterioration; vital signs remained stable with no intraoperative complications observed.
- **Postoperative Disposition:** The patient was extubated and transferred to the recovery unit; both mother and baby were in good condition postoperatively. She continued to be monitored closely and was discharged home in stable condition.

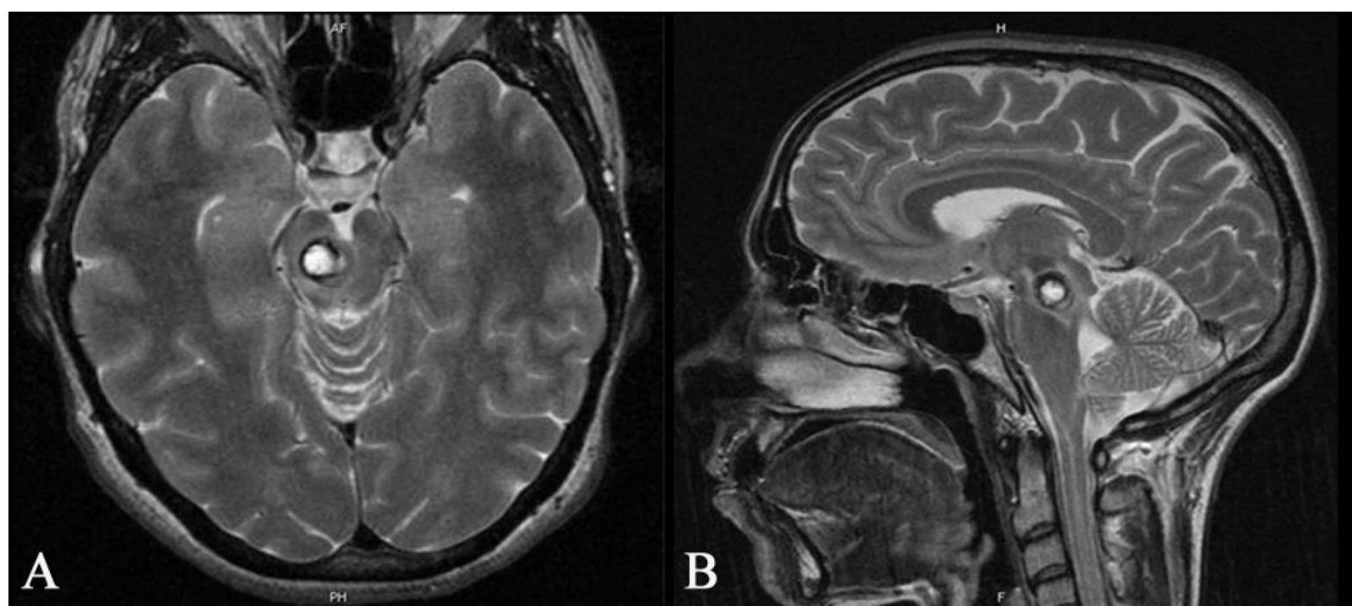
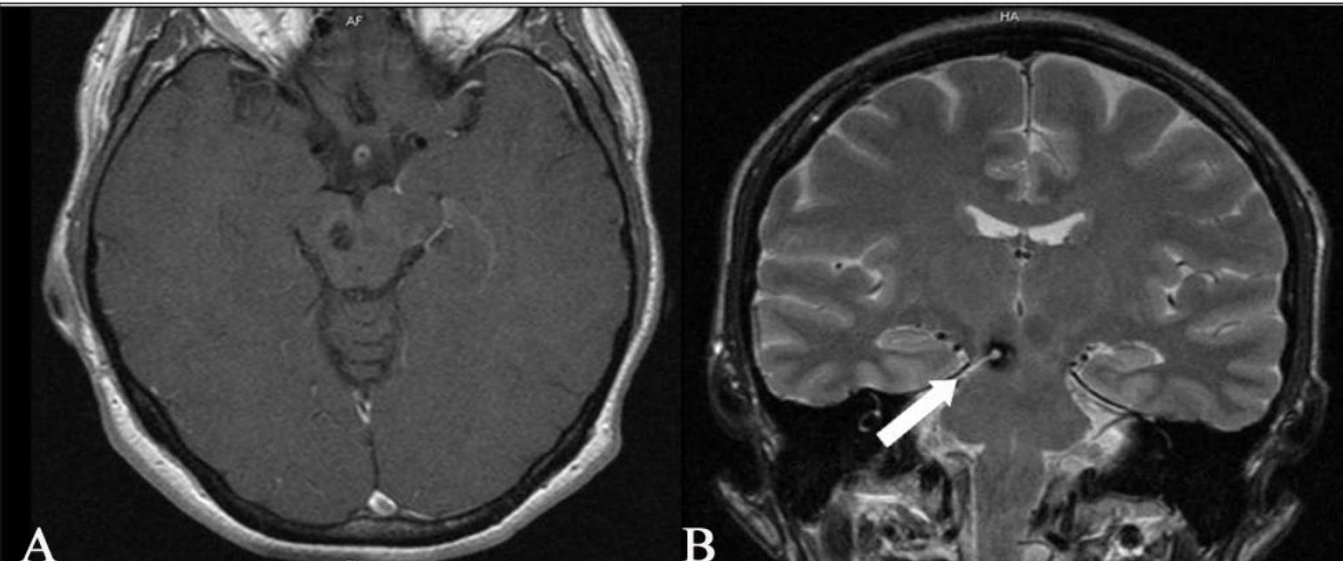


Figure 3. Representative preoperative (above) and postoperative (right) axial and sagittal T2 MRI of a deep-seated cavernous malformation in the right midbrain causing gait disturbances and headaches.

"Ventriculoperitoneal Shunt Placement," MDPI, 2024.



Discussion

- **Anesthetic Considerations in Patients with VP Shunts and Neurosurgical Histories:** Patients with VP shunts and recent neurosurgical procedures pose significant risks during anesthesia due to potential intracranial pressure (ICP) fluctuations.
- **Rationale for Choosing General Anesthesia:** General anesthesia allows for better control of ventilation and carbon dioxide levels, which influence cerebral blood flow and ICP. In the absence of recent imaging to assess shunt function and intracranial anatomy, general anesthesia provides a safer option over regional techniques.
- **Risks of Regional Anesthesia in Neurosurgical Patients:** Regional anesthesia may be contraindicated due to the risk of dural puncture and potential for brain herniation in patients with altered intracranial dynamics or obstructed cerebrospinal fluid flow.
- **Management of Intracranial Pressure During Anesthesia:** Techniques to prevent increases in ICP include smooth induction, avoidance of agents that raise ICP, and careful control of ventilation to maintain normocapnia.
- **Considerations Regarding Anticoagulation:** While patients with VP shunts may be on anticoagulants to prevent shunt thrombosis, in this case, there was no indication of anticoagulant use, simplifying perioperative management concerning bleeding risks.
- **Clinical Implications:** This case highlights the importance of understanding the pathophysiological changes in patients with neurosurgical histories. Individualized anesthetic plans are crucial to optimize maternal and fetal outcomes, especially when recent diagnostic information is unavailable.

References

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