



## RESEARCH ARTICLE

### ANESTHETIC MANAGEMENT IN SIMULTANEOUS SURGERY: CESAREAN SECTION AND MENINGIOMA RESECTION

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#### ABSTRACT

Managing the simultaneous performance of a cesarean section and intracranial meningioma resection in pregnant patients presents a significant anesthetic challenge. This case report describes a 34-year-old woman at 27 weeks of pregnancy diagnosed with a left pontocerebellar angle meningioma. The patient experienced acute neurological deterioration, necessitating urgent surgical intervention comprising a cesarean section and tumor resection in a single operative session. A target-controlled infusion (TCI) strategy employing fentanyl and propofol was utilized alongside advanced hemodynamic monitoring and tranexamic acid administration to mitigate blood loss. This report underscores the necessity of meticulous perioperative planning and a coordinated multidisciplinary approach to optimize both maternal and fetal outcomes.

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## INTRODUCTION

Pregnancy complicated by neurosurgical conditions poses significant challenges due to physiological adaptations and the hormonal effects on tumor growth. While primary tumors of the central nervous system are not more prevalent during pregnancy, symptom exacerbation due to hormonal and hemodynamic changes is well documented. Meningiomas, in particular, may exhibit accelerated growth due to the presence of estrogen and progesterone receptors, leading to worsening neurological symptoms. Managing such patients requires an individualized approach, taking into account fetal viability, maternal stability, and the urgency of neurosurgical intervention. Anesthetic management plays a pivotal role in maintaining hemodynamic stability while ensuring adequate cerebral and placental perfusion.

## CASE REPORT

**Patient:** A 34-year-old woman with a meningioma in the left pontocerebellar angle at 27 weeks of pregnancy.

**Clinical Course:** The patient initially presented with left-sided facial paralysis, nausea, vertigo, and headache. Magnetic resonance imaging confirmed hydrocephalus, prompting the

placement of a ventriculoperitoneal shunt. Subsequent acute neurological deterioration necessitated concurrent cesarean section and tumor resection.

### Anesthetic Management

#### Induction

- Fentanyl TCI (2.5 ng/ml)
- Propofol TCI (3 mcg/ml)
- Rocuronium 100 mg
- **Ventilation:** Volume-controlled mode, FiO<sub>2</sub> 65%, tidal volume 325 ml, respiratory rate 16/min.
- **Monitoring:** Type II, ultrasound-guided right internal jugular central venous catheter, radial artery 20G.
- **Cesarean Section:** Delivered a live male neonate (900 g, APGAR 8/9), estimated blood loss: 500 ml.
- **Tumor Resection:** Right Park-Bench position, maintenance with TCI fentanyl and propofol, lidocaine infusion, and tranexamic acid (1 mg/kg/hr). Hemodynamic stability was preserved without vasopressor support. Estimated blood loss: 300 ml. Due to residual tumor presence, a second-stage surgery was planned.

**Second Surgery:** Resection of the recurrent tumor and tracheostomy. Hemodynamic stability was maintained

throughout, with an estimated blood loss of 600 ml. The patient received one unit of packed red blood cells and one unit of fresh frozen plasma. The procedure concluded uneventfully.

## DISCUSSION

Anesthetic management for combined cesarean delivery and neurosurgical intervention presents unique challenges due to the opposing requirements of maternal hemodynamic stability and cerebral perfusion optimization. Physiological changes in pregnancy alter anesthetic pharmacokinetics, necessitating precise dosing strategies. The use of TCI facilitated optimal anesthetic depth while minimizing hemodynamic fluctuations. Furthermore, administering tranexamic acid effectively reduced intraoperative blood loss and mitigated the risk of hemodynamic instability. A multidisciplinary approach was crucial in optimizing both maternal and fetal outcomes, reducing the risk of fetal hypoxia while ensuring maternal neurological stability. Staging the tumor resection over two sessions proved beneficial, preventing prolonged intraoperative hypotension that could compromise cerebral perfusion.

## CONCLUSION

Performing both a cesarean section and a neurosurgical tumor resection in a pregnant patient necessitates careful anesthetic planning and a multidisciplinary strategy. The use of target-controlled infusions and hemodynamic optimization contributed to a successful outcome for both mother and child. Future research should focus on establishing standardized guidelines for anesthetic management in these complex surgical scenarios.

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