The Asleep-Awake-Asleep Technique for Craniotomy in a Pregnant Woman

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Introduction: The Asleep-Awake-Asleep technique provides patient comfort while creating ideal surgical conditions for functional brain mapping during resection of lesions near the eloquent cortex. A broad range of conditions must be considered for successful anesthesia management. In this case, the technique was tailored for a patient in her 3rd trimester of pregnancy.

Case Report: A 40 year old G2P0 previously healthy female in her 31st week of pregnancy presented with 3 weeks of word finding difficulties. An MRI showed a left frontal lobe hemorrhagic lesion located near the precentral gyrus, suspicious for tumor or cavernous angioma. Neurosurgery recommended immediate excision of the lesion. Several options were presented, including waiting until after delivery or a cesarean section prior to surgery. After discussion of the risks and benefits, the patient and her family chose to proceed with surgery. The Asleep-Awake-Asleep technique was modified to account for maternal physiology and fetal well-being. An awake nasal fiberoptic intubation was performed in the sitting position. Mannitol was infused over 1 hour and the PaCO2 was maintained at 35 mmHg. Fetal well-being was monitored via continuous fetal heart rate, and tocodynamometer monitoring. Awake functional brain mapping was uneventful. The patient was discharged 9 days after an uneventful postoperative course. The baby was delivered at 38+2 weeks gestation, via a scheduled cesarean section under epidural anesthesia. She had significant improvement of her language deficits.

Discussion: We have not found a prior report of intraoperative awake functional brain mapping in a pregnant patient. Intracranial lesions during pregnancy can be managed by delaying surgery, Caesarian section followed by surgery, or surgery followed by Caesarian section at term. An aggressive course of treatment was recommended for this patient as she presented with a symptomatic intracranial hemorrhage. In addition to addressing the common complications of awake functional brain mapping, such as respiratory compromise, agitation, shivering, seizures, and nausea, the anesthesia was adjusted to account for physiologic changes in the 3rd trimester as well as fetal well-being. An awake nasal fiberoptic intubation was chosen due to the risk of difficult airways in pregnant women and because patients tolerate nasal tube exchangers better during awake speech testing. Mannitol was infused slowly to minimize the risk of fetal dehydration, and the PaCO2 was adjusted to 35 mmHg to reflect the normal compensatory alkalosis of pregnancy. Administration of dexamethasone was unlikely to cause fetal adrenal suppression and was given to minimize neurogenic edema. Although continuous fetal heart rate monitoring was used, drug induced variability is common during anesthesia. This patient had an excellent Result of her intracranial resection using the Asleep-Awake-Asleep technique.