An “Ice Cream Headache” in a Term Gravida: A Case Report

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Abstract

BACKGROUND: Headache is often the only presenting symptom of subarachnoid hemorrhage. Its incidence in pregnancy of 5 per 100,000 is dwarfed by more common, benign causes of a headache, complicating diagnosis.

CASE: We presented a 41-year-old at 38 weeks five days gestational age that presented to a local hospital reporting a “terrible brain freeze” after eating ice cream. After the transfer of care to a tertiary care center a non-contrast computed tomography scan revealed subarachnoid blood layering in the basal cistern suspicious for sequelae of aneurysm rupture. After a cesarean section was performed, the patient was transported to the interventional radiology suite where rupture of a 3mm left para ophthalmic artery aneurysm was confirmed and coiled. A non-ruptured 4mm right para ophthalmic artery aneurysm was also diagnosed. The patient was moved to the Intensive Care Unit in stable condition following the procedures and was discharged post-op day 7. She returned one month later for coiling of the right para ophthalmic artery.

CONCLUSION: Headaches during pregnancy can indicate a variety of disease processes. Subarachnoid hemorrhage has high morbidity and mortality for mother and fetus making prompt diagnosis and treatment crucial. This case highlights the safety and importance of prompt cranial imaging in pregnancy when clinically appropriate.

Case report

A 41-year-old G2P1001 at 38 weeks five days gestational age presented to her local hospital reporting that she was eating ice cream and developed a “terrible brain freeze.” At that time she reported the pain was behind her eyes and felt as if she had twisted a muscle in her neck. She was treated in the emergency department with recurrent doses of intravenous morphine (total of 12 mg) followed by an occipital nerve block. A biophysical profile was performed on the fetus, no other imaging studies were ordered.

She was transferred for a higher level of care when symptoms failed to improve. At the time of arrival to the University Hospital labor and delivery unit she complained of an intermittent headache behind her eyes and neck pain. The symptoms were exacerbated by movement and relieved by pressure and massage. She had no other neurologic complaints or symptoms at this time. She had no obstetrical complaints upon presentation. Her pregnancy was complicated by advanced maternal age (declined aneuploidy testing), obesity (BMI of 40.3), and an elevated 1-hour glucose tolerance test with no follow-up testing. Her obstetric history is significant for induction of labor for oligohydramnios and short-arm syndrome resulting in a primary cesarean section. Her past gynecologic, medical, and surgical history was unremarkable. She reported no history of the neurologic or neurodegenerative disease. She did report a family history of hypertension, lymphoma, and coronary artery disease but no family history of cerebral aneurysms. The patient is married and denied the use of tobacco, alcohol or illicit substances. Her medications include prenatal vitamins, and vitamin D.

Review of systems was negative except as detailed previously.

Vital signs were stable on arrival with a blood pressure of 108/73. During the physical examination, the patient was in distress and was holding an ice pack to her forehead while intermittently crying out in pain at approximately 2-3 minute intervals. There were no abnormal findings on neurologic or ophthalmoscopic exam. Cranial nerves were intact. Strength and sensation intact in both upper and lower extremities. Reflexes were intact and within normal limits. Coordination and gait were also normal. Electronic fetal monitoring was reactive. A non-contrast computed tomography scan of the head revealed subarachnoid blood layering in the basal cistern suspicious for sequelae of aneurysm rupture.

After discussion with neurosurgery and interventional radiology, the patient was taken to the OR for immediate delivery by repeat cesarean section. Following delivery of a viable female infant, she remained intubated with careful blood pressure control and was taken to the interventional radiology suite. During cerebral angiography there was noted to be a ruptured 3 mm left para ophthalmic artery.
aneurysm as well as a non-ruptured 4 mm right para ophthalmic artery aneurysm. Left para ophthalmic artery aneurysm coil embolization was performed at this time. She was transported to the ICU in stable condition. The patient was on a Nicardipine drip, fluid hydration, and Nimodipine. NIH stroke scale of 0, Hunt and Hess G1. She continued to improve and was discharged on post-op day 7. She returned in one month for right para ophthalmic artery aneurysm coiling.

**Discussion**

Headache is often the only presenting symptom of subarachnoid hemorrhage. Its incidence in pregnancy of 5 per 100,000 is dwarfed by more common, benign causes of headache, complicating diagnosis. Clinical suspicion should remain high with patient complaints of a severe headache with acute onset. Subarachnoid hemorrhage during pregnancy presents unique diagnostic and therapeutic challenges. In pregnancy, many etiologies can potentially cause subarachnoid hemorrhages, and clinical suspicion should be high when patients present with acute onset and severe headache. In this case, a ruptured aneurysm caused a subarachnoid hemorrhage and diagnosis and treatment was delayed as no cranial imaging was initially obtained. In a patient with acute onset and severe headache, prompt cranial imaging should be considered.

Risk factors for pregnancy-related subarachnoid hemorrhage include hypertensive disorders, increasing age, tobacco abuse, and coagulopathies. Hypertensive disorders are present in 40% of cases. Management of ruptured intracranial aneurysms is immediate surgical treatment and similar in pregnant and non-pregnant patients. Noncontrast CT is the main diagnostic study for subarachnoid hemorrhage. Sensitivity is around 100% for up to 3 days after aneurysmal SAH. Immediate treatment is necessary to avoid rebleeding and ischemic complications. A meta-analysis showed that with surgical treatment maternal mortality was 11% and fetal mortality was 5%, and without treatment, maternal mortality was 63% and fetal mortality was 27%.

Cesarean section is indicated before surgical treatment if the gestational age of the fetus is greater than 28 weeks. Between 24 -28 weeks gestational age the decision to deliver is made on a case by case basis. If there is little to no chance of survival of the fetus outside the womb (<23 weeks gestational age) surgical treatment should be performed while maintaining the pregnancy.

Cranial imaging should not be withheld due to concerns of pregnancy. During a CT of the head, the radiation to the fetus is negligible and is 0 mGy. Teratogenic effects do not occur below a threshold of 50mGy to 100mGy and only in the first 15 weeks gestation. The lifetime absolute risk of cancer after a second or third-trimester fetus being exposed to radiation is very low. The absolute risk of cancer is estimated to be less than 1% for a second or third-trimester exposure. The risk of radiation-induced cancer is much lower than the risk of radiation-induced harm due to the radiation itself.
25mGy of radiation is low around 1%. When medically indicated pregnancy status or gestational age should not hinder prompt evaluation with cranial imaging.

**Conclusion**

In conclusion, subarachnoid hemorrhage during pregnancy has a high morbidity and mortality rate for both mother and fetus. Diagnosis can be difficult due to the multitude of causes of headaches in pregnancy. However, clinical evaluation, diagnosis, and treatment are similar to that in the non-pregnant patient. The decision for the emergency cesarean section is based upon the gestational age of the fetus. When pregnant patients present with atypical headaches clinical suspicion for subarachnoid hemorrhage should prompt immediate cranial imaging to rule out aneurysmal rupture regardless of gestational age.

**References**