Case Report

Spontaneous adrenal hemorrhage and preeclampsia: A case report

ABSTRACT

Spontaneous Adrenal Hemorrhage is a rare disease. It's one of the rare causes of abdominal pain late in pregnancy. I present a case with near term Spontaneous Adrenal Hemorrhage and concurrent severe preeclampsia, aiming to address the anesthetic considerations and management of such challenging presentation.

Key words: Adrenal hemorrhage; preeclampsia and obstetric anesthesia; pregnancy

Case

A 22-year-old female G2P0010 at 36 weeks gestation presented to an outside hospital with a 24-hour history of left flank pain and nausea. The pain was sharp, stabbing, constant, and radiated to the left mid-abdomen. She denied fever, chills, dysuria, hematuria, urinary frequency, or urgency. She underwent a CT scan that was concerning for adrenal hemorrhage [Figures 1 and 2]. She was noted to have blood pressure in the non-severe range. Later she developed severe range blood pressure and was found to have normal preeclampsia labs and negative urine spot. She was treated with antihypertensive medications including IV hydralazine 10 mg × 1, 20 mg × 2. She underwent an MRI that confirmed left adrenal hemorrhage [Figure 3]. Subsequently, she was transferred to our hospital.

Upon transfer, the patient's vital signs were as follows: blood pressure 168/110 mmHg, heart rate 92 beats per minute, oxygen saturation 99% on room air, and respiratory rate 18 per minute. The abdomen was gravid, soft and non-tender to palpation. Her laboratory values were notable for a white blood cell count of 19,000/uL, hematocrit (Hct) of 30.8% and spot protein/creatinine ratio of 0.3 g/day. All other laboratory values including liver function and coagulation tests were within normal limits.

A review of her history revealed an uneventful pregnancy without prior history of chronic hypertension, gestational hypertension, episodic hypertension, flushing, diarrhea, malignancy, endocrine dysfunction, coagulation disorder, family or personal history of a bleeding disorder, or blunt trauma to the abdomen. Her past medical history was notable only for migraine headaches and anxiety/depression not requiring pharmacological therapy. Her past surgical history included right laparoscopic oophorectomy for a large simple cyst.

A plan was made for conservative management of her adrenal hemorrhage and blood pressure control. Based on severe-range blood pressure on intravenous antihypertensive

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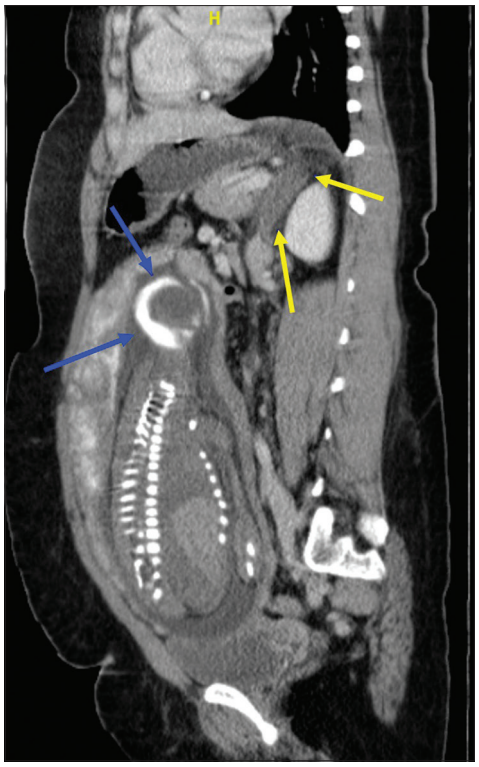

Figure 1: Sagittal abdominal CT scan with thickening and stranding (yellow arrows) surrounding the left adrenal gland consistent with adrenal hemorrhage. Fetal skull (blue arrows) showing the breech presentation

therapy, a diagnosis of preeclampsia with severe features was made. The patient was offered an external cephalic version for fetal breech presentation, but she declined. A decision was made to proceed with cesarean delivery. A combined spinal-epidural anesthetic was provided without complication. The patient tolerated the surgery well and was discharged home 5 days later.

Discussion

Spontaneous adrenal hemorrhage (SAH) occurs rarely in the general population. The incidence of SAH ranges from 0.14% to 1.1% in autopsy studies[1] but its incidence during pregnancy is unknown.[2] The differential diagnosis for adrenal hemorrhage includes: infectious causes (Waterhouse-Friderichsen syndrome, other), bleeding secondary to a mass (pheochromocytoma, other), trauma, and coagulopathy.[3]

The relationship between SAH and preeclampsia is not well established. The pathophysiology of adrenal gland hemorrhage is not fully understood. The distinctive vasculature of the adrenal glands is one of the mechanisms suggested for adrenal hemorrhage. In comparison to its restricted venous drainage, the adrenal gland has a wealthy arterial supply. Also, increased ACTH secretion in stressful

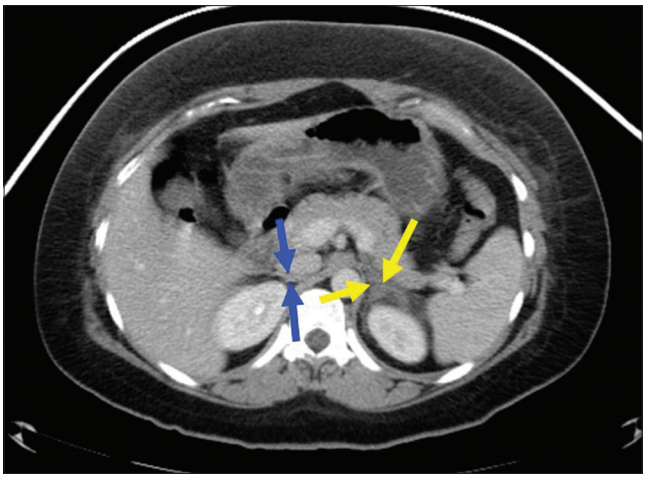

Figure 2: Cross-sectional abdominal CT scan with thickening and stranding (yellow arrows) surrounding the left adrenal gland consistent with adrenal hemorrhage. Normal right adrenal gland (blue arrows)

situations, which stimulates adrenal arterial blood flow that may exceed the organ's restricted venous drainage ability and cause hemorrhage.[4]

The obstetric anesthesia management of this patient required several considerations

Does this patient have an endocrine malignancy with vasoactive metabolites?

The patient presented with concurrent severe-range blood pressure and radiographic confirmation of adrenal hemorrhage to explain her abdominal pain presentation. The possibility of a malignancy in the adrenal gland with vasoactive secretory properties such as pheochromocytoma required investigation. Catecholamine metabolites, metanephrines, were measured in the blood and urine in the preliminary workup of this patient at the time of transfer. However, these laboratory tests are performed off-site and require time.

Required cesarean delivery prior to exclusion of pheochromocytoma

The anesthetic goals included avoidance of episodic hypertension during the perioperative period. In the operating room, vasoactive infusions including Phenylephrine and norepinephrine were prepared for immediate infusion as needed. A radial arterial line and transducer were also prepared for immediate placement if needed in the operating room.

Management of hemodynamic instability during cesarean delivery

Specific concerns were potential hypotension from adrenal insufficiency or worsening hemorrhage after laparotomy and reduced tamponade effect on the site of adrenal hemorrhage. Adrenal insufficiency as a result

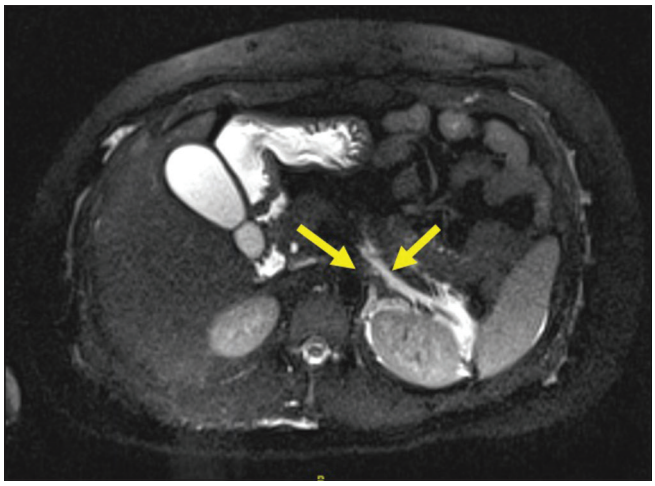

Figure 3: Cross-sectional abdominal T2 Fat suppressed MRI scan with stranding around the mildly enlarged left adrenal gland consistent with adrenal hemorrhage (yellow arrows)

of adrenal hemorrhage is rare but more common with bilateral hemorrhage.[5] Corticosteroid replacement therapy was available in case the patient was showing signs of adrenal insufficiency. Phenylephrine infusion was utilized during cesarean delivery with additional vasoactive infusions immediately available. Two units of blood were crossmatched prior to surgery, and large-bore peripheral intravenous access was obtained. A combined spinal epidural anesthetic technique was chosen over a single shot spinal for the possibility of prolonged operative time due to hemorrhage risk and or need to address the adrenal hemorrhage. A general anesthetic was avoided for the benefit of avoiding the hypertensive response to laryngoscopy in the setting of severe preeclampsia and the inability to exclude the diagnosis of pheochromocytoma.

Conclusion

In conclusion, I present a complicated presentation and management of a patient near term gestation with SAH and concurrent severe preeclampsia. Although her delivery was uneventful, considerations for management of additional hemorrhage, hemodynamic instability, and antihypertensive therapy for blood pressure optimization were paramount. The use of a combined spinal epidural technique offered flexibility for the surgical duration while avoiding a hypertensive response to laryngoscopy. The capacity to provide immediate arterial cannulation and monitoring for such patients is indicated, including peripartum monitoring in a high-acuity labor unit or intensive care unit.

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Conflicts of interest
There are no conflicts of interest.

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