Anesthetic Management of a 28-Week Parturient with Metastatic Wilms’ Tumor

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Background
Wilms tumors, or nephroblastomas, are the most common pediatric renal malignancies in the United States. Two-thirds of these tumors are diagnosed prior to 5 years of age and 95% of them diagnosed prior to 10 years of age. Currently, 80-90% of children diagnosed with them survive with surgery and multimodal chemotherapy. To date, there are only a few case reports of an adult-onset Wilms tumor during pregnancy. We present a rare case and anesthetic management of a previously healthy G1P0 patient who underwent a planned primary Caesarean section at 28-weeks gestation and an open right radical nephrectomy for a rapidly-growing metastatic Wilms tumor.

Case
A previously healthy 23yo G1P0 female at 26-weeks and 4-days gestation was transferred to the University of Colorado Hospital for management of her preterm pregnancy in the setting of a newly-diagnosed right Wilms tumor with pulmonary metastases. She was in her usual state of health with a known pregnancy when she presented to an outside hospital at 14-weeks gestation with back and abdominal pain. Work up at that time included a renal ultrasound and MRI scan that revealed an 8cm right renal mass with cystic characteristics. Conservative, expectant management was planned given these findings. A surveillance MRI scan two months later revealed a 17.1x12x14.9cm right renal mass without extension into the vena cava or liver. A CT scan at this time unfortunately showed suspected metastatic nodules and a percutaneous biopsy confirmed that the mass was a Wilms tumor.

A multidisciplinary care conference was held to determine the appropriate course of action for our patient and her baby. Given the fact that the Wilms tumor had already metastasized to the lungs, the decision was made to expedite delivery of the baby so that adjuvant chemotherapy could be initiated as soon as possible to give the patient the best long-term prognosis. Thus, the patient underwent a planned c-section at 28-weeks gestation which was immediately followed by a radical right nephrectomy.

With this case, general anesthesia was decided to be the safest option for the patient, given the high risk of hemorrhage from manipulation or injury of the vascular Wilms tumor during the c-section portion. A pre-op T7-8 thoracic epidural was placed for post-op analgesia. A 6-gram magnesium sulfate bolus was given for fetal neuroprotection as well. Once in the operating room, a pre-induction arterial line for close hemodynamic monitoring was placed prior to a rapid sequence induction with only propofol and succinylcholine. The patient was intubated without complication and the c-section was immediately started. There was minor hemodynamic instability and the
patient did not require the use of additional uterotonics other than our standard intravenous administration of 30 units of oxytocin. Next, central venous access was obtained prior to the nephrectomy portion.

Overall, the nephrectomy went well and the patient remained hemodynamically stable except for brief hypertension with clamping of the right renal artery, for which propofol was promptly bloused and hemodynamic stability achieved. Fortunately, there was no extension of the tumor burden into the IVC and therefore a TEE (transesophageal echocardiogram) was not performed. In addition, frequent TEG (thromboelastogram) studies were performed that showed normal coagulation and platelet function.

Discussion

This is an extremely unique case that presented many challenges for all specialties involved in her care. Anesthetic considerations in this particular situation included: general versus neuraxial anesthesia for the c-section, obtaining adequate hemodynamic monitoring and vascular access in the event of massive blood loss, concern for extension of tumor burden into the IVC, prompt responses for hemodynamic changes from IVC compression and clamping of the renal artery, and being prepared to manage acquired coagulopathies such as von Willebrand disease (seen in <10% of Wilms tumor patients).

Wilms tumors can be very vascular and any injury to the tumor during the c-section could have resulted in catastrophic bleeding. Taking this into account, general anesthesia was chosen over spinal anesthesia for the c-section. We did not want a potential sympathectomy from a spinal shot to mask hypotension that could occur from injury to the tumor. For induction, just propofol and succinylcholine was given. Succinylcholine is highly ionized and poorly lipid-soluble. Thus only small amounts of the drug cross the placenta, making it a safe option for pregnant patient. Total intravenous analgesia was maintained with a propofol infusion to avoid inhaled anesthetic gases from affecting the respiratory status of the baby, to limit post-operative nausea and vomiting in the patient, and to maintain adequate blood flow across the placenta (Soares, et al.).

Although not present in our case, coagulopathies can be present with Wilms tumors. There are a few case reports of acquired von Willebrand syndrome (AVWS) associated with Wilms tumors, with the coagulopathies resolving after removal of the tumor. AVWS cause prolonged bleeding times due to a deficiency of defective Von Willebrand factors circulating in the blood. Administration of DDAVP, cryoprecipitate, or FFP will correct the coagulopathy.

Fortunately, our case went overall very well without any major complications. The patient had a meaningful recovery and was discharged post-op day #8 and started chemotherapy 2 weeks after surgery. The baby has remained in the NICU and is steadily improving.

References


