Chapter

25

Abdominal Masses

Wilms Tumor

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A 20-month-old girl presents with abdominal distension and a palpable, firm mass in her right abdomen. Ultrasound and CT exams confirm an intra-abdominal mass, and she is scheduled for open resection. Vital signs include: Temp 37.6°C, BP 116/79, HR 88 bpm, SpO_2 100%. Heart and lung sounds are normal.

What Is the Differential Diagnosis for This Child's Abdominal Mass?

Pediatric abdominal malignancies to consider include neuroblastoma, Wilms tumor (nephroblastoma), lymphoma, rhabdomyosarcoma, renal cell carcinoma, leiomyosarcoma, teratoma, and germ cell tumors (see Chapter 24). Other organ pathologies that may present as an abdominal mass include polycystic kidney disease, Meckel's diverticulum, and hepatic storage diseases.

What Is the Incidence and Epidemiology of Wilms Tumor?

There are approximately 500 new cases of Wilms tumor annually in the United States. It is the most common renal malignancy in young children, while renal cell carcinoma is more common in adults and children older than 15 years. Most cases are diagnosed before five years of age, while nearly all are diagnosed before 10 years of age.

What Congenital Syndromes Are Associated with Wilms Tumor?

Most cases of Wilms tumor are sporadic. A minority of cases are part of congenital syndromes including WAGR (Wilms tumor, aniridia, genitourinary anomalies, intellectual disability) syndrome, Beckwith–Wiedemann syndrome, Perlman syndrome, and Sotos syndrome.

What Anesthetic Concerns Do You Have for Wilms Tumor Resection?

Neoadjuvant chemotherapy is often given before surgery and related toxicities may be present, similar to those described in neuroblastoma as discussed in Chapter 24. For those previously exposed to anthracyclines, a preoperative cardiac workup should be obtained including echocardiography. Serum creatinine and electrolytes should be checked, although most patients present with normal renal function (even with bilateral disease). Coagulation status should be evaluated as 10% of patients have an acquired von Willebrand disorder. A particularly important condition to rule out is renal vein and inferior vena cava (IVC) invasion. Intravascular tumor extension increases the risk of pulmonary tumor embolization, and presence of tumor in the IVC or cardiac chambers must be considered if obtaining central venous access. If the tumor is associated with a congenital syndrome, preparation should be made for associated anesthetic concerns, such as difficult airway due to macroglossia in Beckwith-Wiedemann and Sotos syndromes.

How Would Involvement of IVC and Intracardiac Extension of the Tumor Affect the Anesthetic Management?

Wilms tumors often have intraluminal venous extension. Renal vein involvement occurs in less than 40% of cases, with IVC extension in less than 10% and cardiac invasion in less than 1%. The patient may present with lower extremity edema if lower IVC involvement is significant. In the case of cardiac involvement, pleural effusions, hepatomegaly, ascites, or a new murmur may be present. Preoperative detection of tumor extension is thus imperative, and the IVC and right atrium should be checked for

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involvement by ultrasound or CT as part of the preoperative workup of patients with renal tumors. With cardiac involvement, cardiopulmonary bypass is utilized to assist in cardiac resection.

Upper extremity IV access should be secured due to the possibility of IVC compression and impairing venous return. Large bore or central access is strongly advised because of the possibility of large and rapid blood loss during resection when the IVC or aorta is involved?

How Will You Induce Anesthesia in This Child?

Intravenous and inhalational inductions are both options. If the tumor is large and there is concern for central vascular compression or displacement of abdominal contents, judicious intravenous induction with fluid and vasopressor administration may be preferred. Full stomach precautions should be taken if abdominal distension is present and there is potential for delayed gastric emptying.

How Would You Maintain General Anesthesia in This Patient?

Inhalational agent maintenance with air and oxygen is most often employed. Nitrous oxide should be avoided intraoperatively to prevent bowel distension. Analgesia can be achieved intraoperatively with epidural or opioid analgesia.

What Options for Postoperative Analgesia Would You Consider After Abdominal Mass Resection?

An abdominal incision will be painful after surgery and requires either opioid or epidural analgesia. A nurse-controlled opioid analgesic with both demand and continuous doses is appropriate given the patient's age and inability to cooperate with patient-controlled analgesia. A parent may also be given permission to deliver doses if deemed appropriate. Typical opioid choices include morphine or hydromorphone, although if the mass is renal in origin, caution should be taken when using morphine as decreased renal function may result in buildup of opioid metabolites causing toxicity. If an epidural was placed, continuous epidural infusion with or without nurse-controlled analgesia can be utilized. If an epidural was not placed, depending on the location of the incision a regional block such as a transversus abdominis plane or paravertebral block may also be useful.

Suggested Reading

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