American Pediatric Surgical Association

Standardized Toolbox of Education for Pediatric Surgery

Abdominal Masses of Childhood

APSA Committee of Education 2012-13
Abdominal Masses of Childhood

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• Editing Author (each will be peer reviewed)
History

- A child is seen by the PMD
- The mother has noticed the child’s abdomen was different upon bathing
INFANTS

**Flank - 65%**
- Renal - 55%
- Hydronephrosis
- Polycystic kidney
- Mesoblastic nephroma
- Renal ectopic
- Renal vein thrombosis
- Nephroblastomatosis
- Wilms tumor
- **Nonrenal - 10%**
- Adrenal hemorrhage
- Neuroblastoma
- Teratoma

**Pelvic - 15%**
- Hydrometrocolpos
- Ovarian cyst
- Sacrococcygeal teratoma

**Intraperitoneal - 20%**
- GI Masses - 15%
- Duplication
- Meconium ileus
- Mesenteric-omental cyst
- **Hepatobiliary - 5%**
- Hemangioendotheloma
- Hepatoblastoma
- Hepatic cyst
- Choledochal cyst
- Hydrops of gallbladder
CHILDREN AND ADOLESCENTS

**Flank - 78%**
- Renal - 55%
- Wilms tumor
- Hydronephrosis
- Cystic disease
- **Nonrenal - 23%**
- Neuroblastoma
- Teratoma
- Other neoplasms

**Intraperitoneal - 18%**
- GI Masses - 12%
- Appendiceal abscess
- Congenital abnormal.
- Other neoplasms
- **Hepatobiliary - 6%**
- Hepatoblastoma
- Hepatocellular ca
- Choledochal cyst

**Pelvic - 4%**
- Ovarian cyst
- Hydrometrocolpos
• What other points of the history do you want to know?

• Age of child is an important factor that adjust the differential diagnosis
• Mass: duration, associated pain, changes in eating and elimination patterns, history of trauma
• Birth hx: prematurity, difficult birth
• Medical hx: associated medical illnesses
• Family hx: syndromes (Beckwith-Wiedemann, WAGR, Gardner, MEN2B, Bloom)
• ROS: night sweats, malaise, bleeding or bruising, skin changes, sexual history
Physical Exam

• What specifically would you look for?
  • Vital Signs: some tumors can cause elevated HR, BP; some masses may push up on diaphragm and limit breathing
  • Appearance: look for overgrowth
  • H/N: aniridia, raccoon eyes, proptosis, Horner’s syndrome
  • Chest: respiratory embarrassment
Physical Exam

• What specifically would you look for?
  • Cardiac: congestive heart failure
  • Lymphadenopathy
  • Abdomen:
    • Omphalecele, hepatosplenomegaly
    • Mass – location, configuration, size, consistency, mobility, tenderness
  • GU: ambiguous genitalia, hypospadias, cryptorchidism
Studies (Labs)

• What labs needed?
  – CBC and differential
  – Lytes, BUN, Cr
  – Liver function tests
  – Amylase, lipase
  – Stool – Guaic
  – Urine – U/A, Vanillmandelic acid (VMA), Homovanillic acid (HVA)
  – Markers – alpha-fetoprotein, B-HCG
• **Investigations:**
  - X-rays – not usually helpful
  - US – good first test
  - CT Scan – good test to help plan surgery and for staging
  - MRI – limited application
  - Nuclear scans – selective use
CT Scans

Wilms Tumor

Neuroblastoma
Case Discussion

• **Diagnosis**
  – See flowchart

• **Plans**
  – See flowchart
Interval steps before / instead of surgery

• Key is to make sure all staging done first to allow surgical planning and in some instances obviate need for surgery
• Discussion with oncology is important to make sure that all tests are done and patient in fact needs surgery
• Some masses are not cancer however parents will always fear this – you need to be careful in your choice of words – e.g. mass and not tumor
Operation

• Each type of mass has its own approach

• In general terms, knowing the goals of surgery is important:
  – Staging, obtain tissue for diagnosis, resection, assistance with radiotherapy, or assistance with chemotherapy
Staging

- Staging may merely involve assessment of the mass and closing if spread to entire peritoneum.
- However, usually need to consider whether the mass has grown into surrounding structures.
- And sampling lymph nodes to assess for locoregional spread.
Diagnostic

• If the mass is large and/or involving other structures such that a complete resection is not possible, then a portion of the tumor should be sampled to provide tissue for diagnosis

• At least 1 cubic cm of tissue is needed

• Send fresh (i.e. no formalin)
Resection

• In most situations, an attempt at resection will be the case
• Preoperative imaging needs to be studied carefully with interest in the vascular supply
• Care to avoid disruption of the margins to avoid tumor rupture
Radiotherapy

- Some tumors may benefit from post-operative radiotherapy
- To assist this, placing surgical clips at the margins of resection will be helpful
- And documentation of the location of the tumor in the operative notes will also help the radiation oncologist
Chemotherapy

• In those chemoresponsive tumors, placement of a central venous catheter under the same anesthetic as the mass resection will avoid a second anesthetic

• The type of central line should be discussed with the oncology staff
Complications

• **Peri-operative**
  – Ileus is common after any abdominal surgery
  – Post-op intussusception is well reported

• **Long Term**
  – Is dependent on the tumor type and whether rupture has occurred
  – Potential for adhesive bowel obstruction
Post-operative Management

• In most situations, the pathology results will be ready prior to the discharge of the patient
• Discussion with the oncology team to determine whether chemotherapy and/or radiotherapy is needed and if prior to discharge
1. Where do most abdominal masses arise?
   A. Flank
   B. Intraperitoneal
   C. Pelvic
   D. None of the above
Questions

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Questions

2. Which is the most useful first test to order to help determine the type of abdominal mass?
   A. X-ray
   B. Ultrasound
   C. CT scan
   D. MRI
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A. X-ray  
B. **Ultrasound**  
C. CT scan  
D. MRI
3. With regards to abdominal masses, the goal of surgery may include?

A. Staging
B. Obtain tissue for diagnosis
C. Resection of mass
D. Help adjuvant therapy
E. All the above
Questions

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   A. Staging
   B. Obtain tissue for diagnosis
   C. Resection of mass
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   E. All the above
Final Discussion/Review

• The history and physical is key to help determine the type of abdominal mass
• Most masses arise from the flank
• US is the first test to do to determine the source
• CT is the next test to help surgical planning
The preceding educational materials were made available through the American Pediatric Surgical Association.

In order to improve our educational materials we welcome your comments/suggestions:

www.eapsa.org