American Pediatric Surgical Association

Standardized Toolbox of Education for Pediatric Surgery

Hernias

APSA Committee of Education
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CHILDHOOD HERNIAS

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OBJECTIVES

• Understand the pathophysiology of inguinal hernias
• Learn elements in the history and physical examination pertinent to the diagnosis of inguinal hernias
• Understand the basic steps of the operation, including common risks of the procedure.
• Almost all pediatric hernias are *indirect*
• Occurs 1-5% of children
• More common in boys
• 60%-R; 30%-L; 10% bilateral
• “Incarcerated”--viscera is stuck in sac
• “Strangulated”--visceral blood flow is compromised
INGUINAL HERNIAS: PATHOPHYSIOLOGY

• “Processus vaginalis”--peritoneal diverticulum extending through the internal ring at 3 months gestation

• As testis descends at 7-9 months, a portion of the processus is dragged into the scrotum

• The processus vaginalis normally obliterates

• If the processus does not obliterate, a hernia or hydrocele occurs
Case Study

- 3 month old boy referred for a “groin bulge” during his well-baby check
  - Active baby
  - VS: 36.8°C  120    25    70/50
  - Small umbilical hernia
  - Full right hemiscrotum with bilateral descended testes, fullness in the right groin
History Discussion

• Think incarceration/strangulation if there are symptoms of
  – irritability
  – groin pain
  – abdominal distention/pain
  – vomiting
History Discussion

- If the patient presents only with scrotal swelling, the provider should differentiate whether the patient has a communicating or a non-communicating hydrocele.
  - Ask the caregiver whether there are changes in the volume of the scrotum
  - If change is seen, there is a “communication” to the abdominal cavity”—this should be considered a hernia and should be repaired.
  - If scrotal volume is stable, it should be considered a “non communicating hydrocele”. In this case, a hydrocele can be cautiously observed for one year. If the swelling is still present at that time, then a hernia repair should be undertaken.
History Discussion

• Premature infants and twins have a higher likelihood of having an inguinal hernia.

• Other risk factors of having a hernia include those that increase intraabdominal pressure (e.g., prolonged ventilation as a newborn, need for peritoneal dialysis or ventriculoperitoneal shunt)
Physical Exam

• If the bulge is not readily apparent, try maneuvers to increase abdominal pressure.
  – In a baby, gently straightening arms above the head and keeping the knees straight may make the cry.
  – Ask a cooperative toddler or child to jump several times in place.
Studies

- Typically, no labs or imaging are necessary
Case Discussion

• Differential diagnosis
  – Incarcerated hernia
  – Strangulated hernia
  – Acute hydrocele
INGUINAL HERNIAS: PLANS/MANAGEMENT

- Asymptomatic, easily reducible hernia: elective repair within one month
- Incarcerated hernia: IV hydration, sedation, attempted reduction, and repair within 24 hrs
- Strangulated hernia: IV hydration, antibiotics, urgent operation
- Easily reducible hernias should be repaired within one month of diagnosis
- In boys < 2 years old and girls < 5 years old, surgeon should rule out a contralateral hernia if only one side is clinically apparent
  - Diagnostic laparoscopy (through hernia sac or umbilicus)
  - Groin exploration
CONSENT

• Risks to discuss: bleeding (<1%), infection (<1%), damage to the vas deferens and spermatic cord (rare).

• Antibiotics not necessary, unless bowel strangulated at the time of operation.
OPERATIVE REPAIR

• Incision in lower abdomen (lowest abdominal crease)
• Open Scarpa’s fascia and external oblique aponeurosis at external ring
• Separate cremasteric fibers from the sac.
  – Sac is anterior. In boys, sac is medial to the cord
• Sac is suture ligated at the level of the internal ring.
Diagnostic Laparoscopy

Hernia (open processus vaginalis)

No hernia (closed)
Outcomes

- Outpatient surgery with return to normal activities within 1 week
- Operative complications
  - bleeding
  - infection (<1%)
  - injury to cord structures (<2%)
- Recurrence 0.5-1%
- Infertility
Post-operative Management

• Babies <52 weeks Post Menstrual Age (PMA) are routinely admitted after general anesthesia to monitor apnea and bradycardia
  – Young infants are sensitive to GA and narcotics
  – Propensity for A & B most pronounced in former premies
• Some infants can be done under spinal anesthesia.
• Often a single shot caudal block is administered by anesthesia which gives 4-6 hrs of pain control
UMBILICAL HERNIAS

- Spontaneous closure is rule rather than exception
- Majority close by age 3 years
- Two factors: age > 4 years; diameter > 2 cm
- Timing of operation
  - symptomatic for incarceration or pain--immediate
  - asymptomatic --at school age
  - large, proboscis like--1-2 years
Umbilical Hernias

• Use if needed for rare or classic board questions

• Eg. Umbilical hernia
  – Could contain urachus, or omphalomesenteric duct
Epigastric Hernias

• Epigastric hernias present as bumps in the supraumbilical midline.

• Palpable mass is preperitoneal fat

• On the day of surgery, remember to mark the hernia with a surgical marker prior to the operation.
  – The mass may be difficult to locate once the child is asleep
Questions

• You reduce an inguinal hernia in 2-week old boy in the ER. He required IV sedation. The reduction was moderately difficult. The most appropriate plan for operative intervention is:
  a. Admit and plan repair during this admission
  b. Wait until he is 52 weeks PMA and repair hernia
  c. Discharge and elective repair at any time
Questions

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  a. Admit and plan repair during this admission
  b. Wait until he is 52 weeks PMA and repair hernia
  c. Discharge and elective repair at any time
Questions

• A two-month old baby has a large umbilical hernia (2 cm fascial defect, which appears to get larger when she cries. Appropriate management would include:
  a. Reassuring her parents that the umbilical hernia needs no surgical intervention at this time.
  b. Planning an elective operation within the next 6 weeks since the hernia will likely enlarge with time.
  c. Scheduling a repair in the next 2 weeks since the hernia will likely incarcerate
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Questions

• A diagnostic laparoscopy performed at the time of surgery is most applicable to which patient?
  a. An 8 year old girl with a right inguinal hernia.
  b. A 12 year old boy who was found to have a right inguinal hernia after he was “straining” while weight lifting.
  c. A 6 month old otherwise healthy boy with a left inguinal hernia found on a well baby check.
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Final Discussion/Review

• Top 5 take home points for disease
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 at:

www.eapsa.org