Surgical Problems in Children

Ricardo A. Caicedo, MD
Pediatric Gastroenterology
University of Florida
Problems

GASTROINTESTINAL
- Pyloric stenosis
- Malrotation
  - Midgut volvulus
- Duodenal atresia
- Meconium ileus
- Intussusception
  - Meckel’s diverticulum
- Hirschsprung’s disease

GENITOURINARY
- Hypospadias
- Phimosis/paraphimosis
- Cryptorchidism
- Hydrocele
- Testicular torsion

OBJECTIVES
- Recognize
- Diagnose
- Consult surgery
Pyloric stenosis

- Hypertrophy of the gastric outlet
  - 1:150 males, 1:750 females
  - 2-12 weeks of age
- Repetitive vomiting
  - Projectile
  - Non-bilious
- Dehydration
  - Hypochloremic alkalosis
- Exam
  - Visible peristaltic wave
  - Palpable “olive” to right of umbilicus
Pyloric stenosis

- **UGI**
  - Delayed passage of barium through thickened pyloric channel

- **Ultrasound**
  - Thickened, elongated pyloric channel
Pyloric stenosis

Surgical tx = pyloromyotomy

Hypertrophy of pylorus

Endoscopic balloon dilation
Malrotation

- Failure of midgut to rotate into normal anatomic position during development
  - Colon and cecum in left
  - Duodenum on right side
- **Bilious** vomiting
  - Peritoneal (Ladd) bands cause partial bowel obstruction
- High risk for...
Midgut volvulus

- Twisting of bowel around its mesentery and vascular supply
  - Leads to ischemia, infarction, perforation, necrosis
  - Presentation: lethargy, abdominal distention, bloody stools
Duodenal atresia

- Obliteration of lumen
  - Failure to recanalize
- Neonatal *bilious* vomiting
- Associations
  - Prematurity
  - Congenital heart defects
  - Trisomy 21

*SURGICAL EMERGENCY*

*Double bubble sign*

*Complete small bowel obstruction*
Meconium ileus

- CYSTIC FIBROSIS
  - First manifestation in 15% of CF cases
  - Thick meconium impacts in ileum
  - Abdominal distention
    - Bilious vomiting
  - Risk for
    - Volvulus
    - Perforation

Microcolon with meconium plugs
Intussusception

- Telescoping of one segment of bowel into another
  - Ileocolonic most common
  - 6 mos – 3 years old
- Progressive course
  - Intermittent acute abd. pain
  - Vomiting
  - Bloody stools (currant jelly)
  - Fever, lethargy
  - Palpable sausage-shaped mass in upper abdomen
Intussusception Management

- Abdominal X-ray: obstruction
- Contrast enema
  - Diagnostic confirmation
  - Therapeutic in 75% of cases
    - Hydrostatic pressure reduces the intussusception
  - Surgeon must be involved directly
    - If enema reduction fails
    - Small bowel intussusceptions require surgical reduction
Intussusception

Terminal ileum telescoped into cecum
Meckel’s diverticulum

- Remnant of omphalomesenteric duct
- Painless rectal bleeding
  - Less commonly: intuss., volvulus, perforation
- Diagnosis
  - CT scan
  - Nuclear medicine scan
  - Endoscopy
- Treatment
  - Surgical resection
Hirschsprung’s disease

- Congenital absence of ganglion cells in distal rectum
  - and varying distance proximally
- Lack of peristalsis causes colonic obstruction
- Abdominal distention
- Failure to pass meconium
- Fever and diarrhea suggest “toxic megacolon”

SURGICAL EMERGENCY
Hirschsprung’s

Barium enema: Dilated proximal colon with transition zone

AXR: obstructive pattern

Suction rectal bx

Absence of ganglion cells in myenteric plexus
Surgical treatment
1. Colostomy
2. Pull-through and removal of aganglionic segment
Inguinal hernia

- Most common surgical problem
  - More common in male and premature infants
  - Intestinal segment entering into scrotum through processus vaginalis
    - Does not resolve spontaneously
- Painless scrotal bulge
  - Increases in size with crying/straining
- Management
  - Reducible: refer to surgery for repair
  - Incarcerated: immediate surgical consult
Umbilical hernia

- Incomplete closure of umbilical ring fascia
- More common in premature and African-American infants
- Usually close by 2-4 yrs
- Refer to surgery if:
  - Larger than 1.5 cm at 2 yrs
  - Present after 4 yrs
  - Supraumbilical
Hypospadias

- Abnormal low position of urethral meatus
- Absence of ventral foreskin
- Associations
  - Undescended testes
  - Urinary tract anomalies
- Management
  - Avoid circumcision
  - Refer to pediatric urology
Phimosis vs. Paraphimosis

**Phimosis**: inability to retract foreskin
Tx: dorsal slit or circumcision

**Paraphimosis**: foreskin retracted behind coronal groove; tourniquet to glans
Tx: circumcision
Cryptorchidism

- Undescended testicle(s)
  - Spontaneous descent does not occur beyond age 1 yr
  - Bilateral in 1/3 of cases
- Associations
  - Inguinal hernia
  - Hypospadias
  - Higher incidence of
    - Testicular torsion
    - Infertility
    - Cancer in cryptorchid testis
Cryptorchidism

- **Endocrine eval.**
  - Refer early: 6-12 mos of age
  - hCG stimulation test
    - “Locates” functional testes
    - Can aid in descent
  - Karyotype if hypospadias co-exists

- **Surgery**
  - Orchidopexy
    - Usually in 2nd yr of life
Scrotal swelling

PAINLESS
- Hydrocele
- Varicocele
- Spermatocele
- Inguinal hernia

PAINFUL
- Testicular torsion
- Epididymitis
- Orchitis
- Incarcerated hernia
Hydrocele

- Mobile
- Transilluminates
- Spontaneous resolution
Testicular torsion

- Twisting of testis around spermatic cord
  - Caused by abnormal fixation of testis to scrotum
  - Vascular supply compromised
- Acute painful scrotal swelling
  - Severe tenderness
  - Redness or dusky color
  - Testis elevated
  - Cremasteric reflex absent
Torsion

- **R. testis:** blood flow (Doppler)
- **L. testis:** lack of blood flow
- **6 hour window for surgical detorsion**

The consequence of delayed diagnosis

Ultrasound
NUTRITION ➔ GROWTH ➔ DEVELOPMENT ➔ CHILD HEALTH