Encopresis

Background
1. Definition:
   - Inappropriate soiling in children without any organic cause
     - Synonyms:
       - Functional fecal retention
       - Psychogenic megacolon
       - Idiopathic constipation

2. Two subtypes:
   - Retentive
     - Involuntary overflow fecal incontinence secondary to chronic constipation and voluntary withholding of stool
   - Non-Retentive
     - Overflow fecal incontinence without history of constipation or anatomical abnormalities

Pathophysiology
1. Pathology
   - Vicious cycle:
     - Constipation / hard stool
     - Painful defecation
     - Retention
     - More constipation…
   - Chronic constipation leads to stretching of intestinal walls and desensitizing of nerves
   - Diminished nerve sensations and sacrospinal defecation reflex
   - Loss of intestinal peristalsis and incompetent internal anal sphincter leads to involuntary fecal incontinence

2. Incidence and prevalence
   - 1-3 % in children
     - 2.8% at age 4 yrs
     - 1.5% at age 7-8 yrs
     - 1.6% at age 10-11 yrs
   - Male > female
     - 4-5x more common in boys
     - Among patients with hx of constipation, encopresis occurs among 55% of boys and 35% of girls
     - In toddlers (age 2-4), male to female ratio is 1:1
     - By age 5 yrs, male to female ratio is 3:1
     - By age 10 yrs, approx. 1.6% of children still have encopresis

Risk factors
Developmental delay
Enuresis
Milestone changes
- Dietary switch to solid food or cow's milk
- Toilet training
- Start of school

Behavioral problems
- Oppositional Defiant Disorder
- Obsessive Compulsive Disorder
- ADD
- Toilet phobia
- School bathroom avoidance
- Excessive parental intervention
- Early toilet training
- Sexual abuse hx
- Depression
- Eating disturbance

Morbidity/mortality

Morbidity:
- Subject of teasing / bullying
- Social exclusion
- Low self-esteem
- Depression

Mortality
- Extremely rare
- May arise 2° to complications of chronic constipation (bowel obstruction, peritonitis) or due to depression-related suicide

Diagnostics
1. History
   - Symptoms:
     - Onset / duration of encopresis
     - Stool frequency, caliber and consistency
     - Soiling interval
       - Frequent inappropriate soiling hx
       - "Paradoxical diarrhea" (constipation causing encopresis and overflow diarrhea)
     - Constipation history
     - Stool amount deposited into underwear
     - Painful bowels
     - Stool pattern:
       - Retentive:
         - Constipation
         - Multiple stool intervals
         - Looser stools
         - Small caliber
       - Nonretentive:
         - Normal stool intervals
         - Normal caliber
         - Normal consistency
1. Diet:
   - Hx of inadequate dietary fiber- excessive intake of carbohydrates (cheese, pasta, starches) with low-fiber meals
   - Recent transition from breast milk to formula
   - Hx of excessive intake of cow's milk (>32oz/day)- most common cause of constipation in children

2. Medication hx:
   - Antacids, Phenobarbital, Anti-cholinergics, Laxatives, Bismuth, Antidepressants, Sympathomimetics, Opiates

3. Birth hx
   - Delayed passage of meconium (>24 hr age at first passage of meconium) - suggests possible Hirschsprung's disease or cystic fibrosis

4. Past hx
   - Infections- UTI, Abdominal infections
   - Irritable bowel syndrome
   - Inflammatory bowel disease

5. Family hx

6. Psychosocial hx
   - Relationship with parents, peers, school
   - Precipitating events

2. Physical examination
   - Height, Weight, & Growth Curves
     - Hx of delayed growth and failure to thrive raises suspicion for malabsorptive disorders (celiac disease, cystic fibrosis) or Hirschsprung's disease
   - Skin:
     - Pallor, dryness, reduced hair, fixed edema- suggestive of hypothyroid dx
   - Abdomen:
     - Bowel sounds- hypoactive sounds may suggest ileus secondary to constipation
     - Distension:
       - If associated with bilious emesis and pencil-thin stools, evaluate for Hirschsprung’s dx
   - Palpable mass:
     - Fecal mass maybe palpable in the LLQ/ suprapubic region of patients with constipation
     - Palpable fecal mass with an empty rectum suggests Hirschsprung's dx
     - Neoplasms, such as lymphoma, neuroblastoma, and pelvic teratoma, that masquerade as chronic constipation symptoms must be r/o in patients with palpable mass
   - Rectal:
     - Anus position (anteriorly displaced anus, "ectopic anus," contributes to constipation)
     - Anal fissures (consistent with constipation; contribute to fecal retentive behavior when recent / painful)
     - Sphincter position, tone- low suggests fecal retention
     - Vault size
• Digital exam necessary to evaluate for rectal tone, distension and fecal impaction; presence of impaction confirms functional constipation
  ▪ Reflex- presence of cremasteric reflex and anal wink suggests functional constipation; (absence of reflex suggests spinal cord problem)
  ▪ Presence, absence, and texture of stool
  ▪ Empty rectum may suggest Hirschsprung disease
  ▪ Pelvic mass
    ▪ Retentive:
      o Abdominal mass, distension
      o Wet clay-like stool in anal canal
      o Full rectal vault or empty but large, capacious vault
    ▪ Nonretentive:
      o Normal abdomen
      o Normal rectal vault
  o Back:
    ▪ Pigmented, hairy patch or abnormal pit over lumbosacral spine suggests sacral dysraphism
    ▪ Further work-up necessary to r/o neuropathic conditions
  o Neuro:
    ▪ Reflex
      ▪ Delayed relaxation phase of deep tendon reflex- suggestive of hypothyroidism
    ▪ Tone
      ▪ Hypotonia may suggest muscular dystrophy
      ▪ Neuropathic conditions lead to poor defecatory efforts
    ▪ Sensation
      ▪ Use a wisp of cotton to test sacral sensitivity
      ▪ Reflex contraction of external anal sphincter suggest appropriate sacral sensorimotor integrity
      ▪ Perianal sensation is absent with spinal disorders-
        o Spina bifida
        o Myelomeningocele
        o Spinal cord trauma or tethering
        o Static encephalopathy
 3. Diagnostic testing
  o Labs- rarely indicated
    ▪ TSH- if presentation suggestive of hypothyroid disorder (poor linear growth, obesity, enlarged fontanelles, bradycardia)
    ▪ UA- if hx of UTI or enuresis
    ▪ Calcium- if hx suggestive of hypercalcemia
    ▪ Lead- if hx suggests exposure or developmental delay
    ▪ Serum tissue transglutaminase (TTG) and quantitative IgA – if hx suggestive of possible celiac disease
  o Diagnostic Imaging
    ▪ Abdominal x-ray series:
      ▪ To rule out bowel obstruction or if hx suggests Hirschsprung's dz
- X-ray cannot diagnose constipation - must do digital rectal exam
  - Anorectal manometry:
    - If hx suggestive of Hirschsprung's dz (normal internal anal sphincter relaxation rules it out) (83% sensitivity [+/- 2 SD = 63 – 93%]; 93% specificity [+/- 2 SD = 85 – 97%])
  - Barium enema:
    - To evaluate for Hirschsprung's disease (76% sensitivity [+/- 2 SD = 57-89%]; 97% sensitivity [+/- 2 SD = 91 – 99%])
    - Can also evaluate for colonic strictures (necrotizing enterocolitis)
  - Rectal biopsy:
    - Gold standard diagnostic test for Hirschsprung's
      - 93% sensitivity [+/- 2 SD = 77 – 98%]
      - 100% specificity [+/- 2 SD = 96 – 100%]
    - Indicated in constipated patients who have empty rectum on exam or other findings suggestive of Hirschsprung's disease
    - Lack of ganglion cells on biopsy is highly suggestive of Hirschsprung's
    - Hyperganglionosis with increased acetylcholinesterase suggests intestinal neuronal dysplasia

Differential Diagnosis
1. Retentive:
   - Functional- most common cause of fecal retention
   - Anatomical- anal fissures, anal stenosis, trauma, post-surgery, perianal infection (strep, abscess, etc.)
   - Neurogenic- intestinal pseudo obstruction, spinal cord disorder, cerebral palsy, pelvic tumor, Hirschsprung's disease
   - Neuromuscular disorders- muscular dystrophy
   - Connective tissue disorders- Amyloidosis, SLE, Scleroderma
   - Metabolic- hypercalcemia, hypokalemia, cystic fibrosis, hypothyroid, lead poisoning, diabetes mellitus, celiac disease
   - Drugs- Anticholinergics, Antihypertensives, Antacids, Sucralfate, Opiates
2. Non-retentive:
   - Nonorganic (99%)
   - IBD
   - Congenital neurological disorders (spinal cord tumor, lipoma)
   - Post surgical anal sphincter trauma

Acute Treatment
1. Retentive
   - Medications:
     - Disimpaction phase <1 wk
     - Relieve impaction thru oral or rectal cathartics; rarely, manual disimpaction is indicated
     - Stool softeners: mineral oil, lactulose, polyethylene glycol
     - Laxatives: Milk of Magnesia, Senna, Dulcolax, Sodium phosphate enemas
Some experts prefer oral medications over rectal medications
- Monitor fecal production thru parental report, stool diaries
- Success of catharsis based on abundant fecal production and decreased soiling episodes
- Post disimpaction, immediate follow-up is recommended to discuss maintenance therapy
  - Maintenance phase (2-12 mos)
    - Continue treatment with low-dose laxatives for several months after initial disimpaction to maintain daily defecation
    - Titrate doses to obtain 1-3 soft, easy-to-pass bowel movements/day
  - Medication withdrawal phase
    - After months of retraining bowel with cathartics, withdraw medication once patient's bowel can work appropriately on its own
    - Patients must be having at least 1 bowel movement/day without encopresis in order to stop meds
- Modify toilet habits:
  - Encourage child to
    - Sit on toilet for a minimum of 10 minutes 2 times per day, ideally after meals, with a timer
  - Flexion of hips helps to open up rectal wall
  - Foot stools maybe used to increase abdominal pressure
  - Schedule prompted toilet sits
    - Begin with short 30 sec sits
    - Gradually increase to 5 minute sits 3-5/day
  - Goal is to associate toilet sitting with enjoyable activities
  - Provide pleasant and relaxed atmosphere with plenty of parental attention
- Diet:
  - Provide adequate daily intake of high-fiber, fruits, vegetables
  - Daily recommended fiber intake is age of child (in years) plus 5 grams

2. Non-retentive
- Behavioral modification
  - Regulate toilet sitting behavior- give positive incentives for bowel movements in the toilet
  - Schedule prompted toilet sits
  - Parents should stop pressuring patients with reminders, lectures, inquiries about bowel movements
  - Change soiling immediately- emphasize that parents should use this opportunity as a neutral, timely interaction
- Dietary modification
  - Ensure well-formed, soft stools with high fiber in meals
  - Stop all medications: laxatives, stool softeners

Further Management
1. Retentive
- More than 30% will still be impacted 1 wk into treatment
- Repeat abdominal/rectal exam
1. If no bowel movement for 48 hr, increase stool softeners
2. Non-retentive:
   o Requires more intensive treatment
   o No stool softeners needed
   o Minimize pressure from parents for a child to be toilet trained
   o Encourage parents to avoid punishing child for soiling
   o Provide positive incentives: praise, hug, sticker, giving them their favorite treats

**Long Term Care**
1. Goal is to have 1-3 easy-to-pass bowel movements every day (may take years to accomplish)
2. Provide extensive parental education
3. Emphasize behavioral modification
4. Encourage reward system to improve patient compliance
5. Wean laxatives as patient's bowel frequency stabilizes
   o Must be stable for at least 6 months prior to decreasing laxatives

**Follow-Up**
1. Return to office
   o Regular and frequent monitoring necessary to prevent recurrences
   o Children with impaction must be evaluated within 1 wk into treatment
   o RTC should be on a monthly basis initially
   o Monitor stool records every 3-4 months, repeating physical exam when necessary
   o Adjust medication, diet regimen as needed based on clinical progress
2. Refer to specialist
   o Gastroenterologist:
     o If oral medication regimen fails to improve disimpaction
     o If systemic symptoms or growth failure complicating encopresis
   o Psychiatrist or psychologist:
     o Refusal to sit on toilet by patient >5 yo
     o Refusal to take meds
     o Non-retentive encopresis and >8 yo
     o Depressive symptoms
     o Disturbed parent-child relationship
3. Admit to hospital
   o Majority of cases may be managed as outpatient
   o Admit if complications arise from chronic constipation
     ▪ Bowel obstruction
     ▪ History of anatomical anomalies

**Prognosis**
1. Retentive:
   o 99% cure with pain-related impaction
   o 70% cure with psychogenic impaction: may need further evaluation by psychiatrists
2. Non retentive:
   - 90-95% cure if <5 yr history

Prevention
1. Treat non-encopretic constipation promptly
2. Educate and instruct parents to increase laxatives if child goes >2 days without bowel movement
3. Vigorous intervention necessary if reimpaction occurs: double laxatives, enema, or suppositories
4. Emphasize scheduled 10 minute toilet sitting 2/day to relieve early impaction

References
8. Taylor, B. Robert. Family Medicine, Principles and Practice, page 205

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