Management of Intestinal Malrotation in Children vs. Adults

Disclosures

“I have nothing to disclose.”

Midgut volvulus: a surgeon’s dilemma

Normal Rotation of the Midgut
Normal Rotation of the Midgut

1. Duodenum rotates behind SMA
2. Right colon rotates over the top of SMA

"The midgut mesentery is a plane"
Malrotation of the Midgut

1. Duodenum fails to cross midline
2. Ladd’s bands form to RUQ

Fulcrum for Midgut Volvulus

Clockwise rotation of the midgut
Midgut Volvulus

Ladd’s Procedure

1. Counterclockwise de-torsion of the midgut
   - “turn back the hands of time”

2. Divide Ladd’s bands

3. Broaden the midgut mesentery

4. Appendectomy

5. Place the midgut in “non-rotated” configuration
   - Small bowel >>> Right
   - Colon >>> Left
   - Cecum >>> Hypogastric midline

Ladd’s Procedure is Effective

- 147 patients over 10-year period
- 38 (26%) post-operative complications
- 11 (7.5%) reoperation
  - 8 (5.4%) Adhesive SBO
  - 1 (0.7%) Volvulus
- Laparoscopic vs Open
  - Similar complication rates

Assessment of recurrent abdominal symptoms after Ladd procedure: clinical and radiographic correlation
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Age-related Presentation

Age at presentation


Duration of symptoms by age


Management of “Asymptomatic” Malrotation

- Markov decision analysis
  
  Parameters
  
  - Risk of observation: volvulus, short gut, death
  
  - Risk of operation: death

  Treatment recommendation
  
  - QALY gain by either operation or observation

  Children: Ladd’s procedure should be considered

  Adults: The risk of midgut volvulus does not justify prophylactic Ladd’s procedure

Summary

• Intestinal malrotation is the primary risk factor for midgut volvulus
• Clinical presentation varies with age
  • Babies: bilious emesis
  • Adult: abdominal pain and obstructive symptoms
• Ladd’s procedure effectively prevents midgut volvulus
• All symptomatic patients should have a Ladd’s procedure
• “Asymptomatic” malrotation is less concerning with age