WHAT IS AN INTERNAL HERNIA?

- Protrusion of the gut through the peritoneum, mesentery, or omentum into a compartment in the abdominal cavity
- The hernia orifice is usually a preexisting foramen, recess, and fossa but can be caused by surgery, ischemia, and trauma
WHAT YOU MUST KNOW

• When you see closed loop SBO think IH
• When you see BO in a post surgical patient, especially RYGB think IH
• When you see ischemic changes in SBO think IH
WHAT YOU MUST KNOW

- IH should be the major default diagnosis after adhesions in patients with SBO, especially with closed loop or strangulating features.
- IHs are an important contributor to tsunami of requests for outpatient abdominal CT scans for abdominal discomfort and pain.
- Source of chronic and intermittent bowel obstruction.
WHAT YOU MUST KNOW

- During the past decade the incidence of IH has increased due to more frequent bariatric surgery and liver transplantation.
TYPES OF INTERNAL HERNIAS

- Left paraduodenal
- Right paraduodenal
- Pericecal
- Foramen of Winslow
- Transomental
- Intersigmoid
- Transmesenteric
- Retroanastomotic

Radiographics 25: 997-1015, 2005
CAUSES OF SMALL BOWEL OBSTRUCTION

- ADHESIONS 49%
- HERNIAS 30%
- NEOPLASMS 15%
- OTHER 6%
HERNIAS AS CAUSE OF BOWEL OBSTRUCTION

- INTERNAL HERNIAS 15%
- EXTERNAL HERNIAS 85%
HERNIAS AS CAUSE OF STANGULATION

- INTERNAL HERNIAS 40%
- EXTERNAL HERNIAS 60%
HERNIAS ARE THE MOST COMMON CAUSE OF STRANGULATING OBSTRUCTION
SBO: CLINICAL FEATURES

- 60-80% OF INTESTINAL OBST
- 20% OF ER SURG ADMISSIONS
- 5-6% MORTALITY IN ALL BO
- 10-15% MORTALITY IN CLOSED LOOP
- 9,000 DEATHS IN US
- PREOP DX STRANGULATION IN 48%
INTERNAL HERNIAS ARE THE QUINTESSENTIAL SUBSTRATES FOR CLOSED LOOP OBSTRUCTION
OUR MOST IMPORTANT JOB

SIMPLE VS CLOSED LOOP

OBSTRUCTION
1. Transition Point: Single discordance of SB caliber
2. Tapering: Tapered distention back to the Ligament of Treitz
3. SB meanders to maximum allowed by mesentery
1. **TRANSITION POINTS:**
   double discordance of lumen caliber
2. **TAPERING:** SB less distended above the level of the first TP than between TPs
3. Clustering of SB loops that are blocked at 2 ends
FLUID, NO CONTRAST

FLUID + CONTRAST

FLUID + CONTRAST
INTERNAL HERNIAS: AIDS IN PREOPERATIVE DIAGNOSIS

- Engorged, stretched, and displaced mesenteric vascular pedicle and convergence of vessels at the hernia orifice
- Saclike mass or cluster of dilated SB loops at an abnormal anatomic location in the setting of SBO
- Abnormal location of gut
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INTERNAL HERNIAS CAUSING CLOSED LOOP OBSTRUCTION

- Close proximity of afferent and efferent limbs, often at the site of mesenteric convergence
- C-shaped, U-shaped, or coffee bean configuration of the bowel loop with converging toward the orifice of the hernia
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CT FINDINGS OF STRANGULATING INTERNAL HERNIAS: MURAL FEATURES

- Circumferential mural thickening > 3mm
- Target or halo sign (submucosal edema)
- Focal loss of mural enhancement (impaired arterial flow)
- Persistent mural enhancement (impaired venous outflow)
- Mural hemorrhage or haziness on NCCT
- Pneumatosis
CT FINDINGS OF STRANGULATING INTERNAL HERNIAS: EXTRAMURAL FEATURES

- Engorged mesenteric veins
- Mesenteric stranding or hemorrhage
- Ascites (esp within the mesentery)
- Portomesenteric venous gas
- Perforation
**INTERNAL HERNIAS**

<table>
<thead>
<tr>
<th>Type</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Paraduodenal</td>
<td>53%</td>
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<tr>
<td>Pericecal</td>
<td>13%</td>
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<td>Foramen of Winslow</td>
<td>8%</td>
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<tr>
<td>Transmesenteric</td>
<td>8%</td>
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<tr>
<td>Intersigmoid</td>
<td>6%</td>
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<tr>
<td>Supravesical-pelvic</td>
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<tr>
<td>Transomental</td>
<td>1-4%</td>
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</table>
FORAMEN OF WINSLOW
HERNIA

AJR 186: 703-717, 2006
INTERNAL HERNIAS ASSOCIATED WITH RYGB

- Transmesocolic
- Retroanastomotic
- Petersen type
THINK INTERNAL HERNIA

- GASTRIC BYPASS PATIENT
- OBSTRUCTION WITH NO EXTERNAL HERNIA OR HISTORY OF SURGERY
- CLOSED LOOP OR STRANGULATION
BE VERY SUSPICIOUS

- Gut in abnormal location
- Swirled mesentery
- Sac-like collection of gut
IN YOUR REPORT

- Mural thickening, mesenteric edema or hemorrhage, ascites, swirled mesentery are suspicious for internal hernia with ischemia.
- Patients with RYGB are at increased risk for ischemia in the presence of bowel obstruction.