Acute Sigmoid Diverticulitis and its Complications

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Year III
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April 2011
Agenda

- What Acute Sigmoid Diverticulitis is
- Role and Goals of Imaging
  - Why image?
  - Menu of Tests
    - Strength/weaknesses
- Findings and Complications
Diverticulosis 1

- Diverticulosis - presence of many diverticula

- Diverticulum - pouch or a pocket-like opening in the bowel wall
  - Mucosa/submucosa/serosa

- 2/3 of 65 years and older
  - ¼ of those will get diverticulitis
Diverticulosis 2

- Usually left sided - descending colon and sigmoid
- Can be anywhere
- Asian population right sided predominence
- Diverticulum bleed
Diverticulitis

- **Location**
  - Most diverticulitis - sigmoid

- **Inflammation or infection of the diverticulum**
  - Microperforations
    - Intraluminal pressure, inspissated stool
  - Edema
    - Wall thickening
  - Pericolic inflammation - inflamed fat
Diverticulitis: Complications

- Anatomy
  - Pericolonic, intraperitoneal, retroperitoneal
- Abscess
- Fistula
- Macroperforation
Clinical diagnosis vs. Imaging

- Many patients present with typical clinical picture
  - LLQ pain, fever, and leukocytosis-
    - Most common cause is acute sigmoid diverticulitis
  - Age, history of diverticulosis or diverticulitis
  - Many patients can then be managed medically with antibiotics

- Why image?
Goal of Imaging

- Narrow differential diagnoses to a diagnosis

- Management
# Differential Diagnosis

## Table 1. Differential Diagnosis of Left Lower-Quadrant Pain

<table>
<thead>
<tr>
<th>Gastrointestinal</th>
<th>Gynecologic</th>
<th>Vascular</th>
<th>Other</th>
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</thead>
<tbody>
<tr>
<td>Constipation</td>
<td>Ectopic pregnancy</td>
<td>Aortitis/vasculitis</td>
<td>Abdominal wall abscess</td>
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<td>Incarcerated hernia</td>
<td>Endometriosis</td>
<td>Dissection/aneurysm</td>
<td>Abdominal wall hematoma</td>
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<td>Infectious colitis</td>
<td>Hemorrhagic or ruptured ovarian cyst</td>
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<td>Psoas abscess</td>
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<td>Inflammatory bowel disease</td>
<td>Malignancy</td>
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<td>Ischemic bowel</td>
<td>Miscarriage</td>
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<td>Omental infarction</td>
<td>Mittelschmerz</td>
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<tr>
<td>Sigmoid diverticulitis</td>
<td>Ovarian torsion</td>
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<td><strong>Genitourinary</strong></td>
<td>Pelvic congestion syndrome</td>
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<tr>
<td>Prostatitis</td>
<td>Ruptured corpus luteum</td>
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<tr>
<td>Seminal vesiculitis</td>
<td>Uterine fibroids</td>
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<tr>
<td>Ureterolithiasis</td>
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<tr>
<td>Urinary tract infection</td>
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Goal of Imaging

- Narrow differential diagnoses to a diagnosis

Management

- Extent of disease
  - Staging (CT)
  - Complications
- 15-30% will need surgery—imaging helps decide
Menu of Tests

- Computed Tomography With Contrast
- Compression Ultrasonography (U/S)
- Barium Enema (BE) radiography
CT with Contrast

- Direct examination of lumen, wall, pericolonic, intraperitoneal and retroperitoneal spaces
  - Ability to diagnose other conditions
  - Ability to stage extent of disease and presence of complications
- 79-99% sensitivity
- High specificity
- Pitfall—perforated colon cancer can mimic diverticulitis clinically and radiographically
  - f/u BE or colonoscopy
CT Staging- Hinchey’s Criteria

- Stage 0- bowel wall thickening
  - Medical management
- Stage 1- small pericolonic abscess
  - Medical management
- Stage 2- large abscess not extending beyond pelvis
  - Drain percutaneously/surgery
- Stage 3- abscess beyond pelvis
  - Surgery
- Stage 4- free rupture of diverticulum into peritoneal cavity- fecal peritonitis
  - Surgery
Now Let’s Look at a Patient
Our Patient: Classic CT findings 1

- 53 yr old man with mild LLQ abdominal pain for 2 days and low grade fever

- Axial CT with contrast
- Inflammed divertculeum-air pockets with surrounding edema
- Wall thickening
Our Patient: Classic CT findings 2

- Axial CT with contrast
- Fat stranding
- Pericolonic inflammation abutting/adherent to bladder
Now Let’s Look at Complications of Diverticulitis seen in Our Patient
Our Patient: Complications on CT 1

- Axial CT with contrast
- Pericolonic rim-enhancing gas and fluid collection consistent with a diverticular abscess
- Air within bladder suggestive of colovesical fistula

PACS, BIDMC
More on Abscess Complication

- Most common complication of diverticulitis
- Presence, size, and location used to determine staging
- Plegmnon and/or abscess seen on 35% of cases of diverticulitis imaged with CT
- Can be drained percutaneously with CT guidance or surgically
More on Fistula Complication

- 20% of surgically treated diverticulitis
- Colovesical- most common (65%)
  - Male predominance
  - Uterus protects bladder
- Colovaginal (25%)
- Coloenteric (<10%)
- Colouterine- rare
- Colocutaneous- rare
Our Patient: Complications on CT 2

- Axial CT with contrast
- Contrast in bladder, further evidence of colovesical fistula
- Pericolonic inflammation
- Large inflammed diverticulum
Our Patient: Colovesical Fistula

- Axial CT with contrast
- Contrast in bladder, further evidence of colovesical fistula
Our Patient: More history

- Pneumaturia with dysuria, consistent with colovesical fistula seen on CT
- History of known diverticulosis
- Third episode of diverticulitis week prior to presentation
  - managed conservatively as an outpatient.
  - Was not imaged at that time
We will now examine other complications using images of companion patients
Companion Patient 1: Colocutaneous Fistula

- Axial CT with contrast
- Fistula track from colon through subcutaneous tissue to cutaneous tissue

Companion Patient 2: Perforation

- Axial CT with contrast
- Pneumoperitoneum (Extraluminal air)

http://brighamrad.harvard.edu/Cases/bwh/hcache/124/full.html
Other Imaging Modalities

- Graded Compression Ultrasonography
- Barium Enema
Graded Compression U/S

- Women of childbearing age or pregnant patients
  - Best for GYN differential
  - No radiation
- Sensitivity- 77-98%
- Specificity- 80-99%
- Operator dependent
  - Direct physician involvement in examination recommended
U/S Findings

- Wall thickness (hypoechoic)
- Pericolonic fat inflammation (echogenic)
- Identify abscess (hypoechoic)
- Identify fistula (hypoechoic, bubbles)

- Echogenic material filling inflammed diverticulum - air, fecal material, enterolith
- Hypoechoic colonic wall thickening
- Echogenic pericolonic fat inflammation
Barium Enema

- Former primary imaging modality
- Differential limited
- Only detects secondary affects of inflammation on colon
  - Not sensitive to primary pericolonic inflammation
  - Not sensitive to complications
- Sensitivity- 59-90%
- More invasive
- Can be follow up study if CT is equivocal
BE Findings

- Fold thickening
- Segmental spasm
- Sinus tract
- Fistula
- Mass effect from abscess or free air


• Segmental spasm
Summary

- Acute inflammation and infection of diverticulum
- Microperforations leading to extraluminal inflammation
- Abscess, Fistula, Macroperforation complications
- CT with contrast imaging modality of choice
References


Acknowledgments

- Dr. Gillian Lieberman
- Dr. Tamuna Chadashvili