DIVERTICULITIS

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Objectives

• Review the epidemiology and terminology of diverticular disease
• Describe the clinical features and pathophysiology of acute diverticulitis
• Recognize the complications of diverticular disease-abscess, perforation, fistula, obstruction
• Discuss various means of diagnosis of acute diverticulitis
• Describe treatment strategies for diverticulitis
Epidemiology of diverticular disease

- Overall prevalence 20-60% in general population
- Affects <10% of those <40 yrs; 50-70% of those >80 yrs
- No sex difference
- Disease of developed countries
- Prevalence of pts that require med/surg tx increased 16% in last 20 years

- 2006 National Hospital Discharge Summary
  - 314,000 admissions per year
  - 1.5 million days of inpatient care per year
  - 73.4% of this care is due to acute diverticulitis
  - In 1998 cost of treatment $2.5 billion per year
Terminology

- Diverticulum: sac-like protrusion of colonic wall
- Diverticulosis: presence of diverticula
- Diverticulitis: inflammation of diverticula
- Complicated diverticulitis: diverticulitis with additional problems (abscess, perforation, fistula, obstruction)

- Diverticula of diverticulosis are not true diverticula
  - False, or pulsion, diverticula in which mucosa and submucosa herniate through muscular layer
- Herniation at areas of weakness in colon wall
  - Areas where vasa recta enters muscularis
Contributing factors

- Lack of dietary fiber
- Problems with colonic motility
- Colon wall abnormalities
- Physical inactivity
- Constipation
- Obesity
- Smoking
- NSAIDs

- No convincing evidence to support previously common advice to avoid seeds and popcorn
Diverticulosis

- Affects descending and sigmoid colon in >90%
  - 35% have more proximal tics also
  - 7% have pancolonic tics
- Right sided diverticuli more common in Asians and younger patients

- 70% remain free of complications
- 15-25% will develop acute diverticulitis (AD)
  - 75% uncomplicated diverticulitis
  - 25% complicated by abscess, obstruction, perforation, or fistula
Clinical features of AD

• 70% LLQ pain
• 50% previous episode(s) of diverticulitis
• 50% constipation
• 25-35% diarrhea
• 20-62% nausea/vomiting
• 10-15% urinary symptoms
• 20% tender mass palpable on exam
• 45% have normal wbc
• Fever

• Right sided symptoms in Asians, younger patients, and those with redundant sigmoid colon
Differential diagnosis of AD

• Appendicitis (if redundant sigmoid)
• Inflammatory bowel disease
• Pelvic inflammatory disease
• Ectopic pregnancy
• Ovarian torsion/ruptured cyst
• Cystitis
• Epiploic appendagitis
• Advanced colon cancer
• Infectious colitis
• Ischemic colitis
Pathophysiology of acute diverticulitis

- Sigmoid diverticulitis is MCC of LLQ pain in adults
- Inspissated food leads to mucus secretion and bacterial overgrowth within the diverticulum
  - Earlier thought that fecaliths caused obstruction; this is rare
- Uncomplicated AD results if the process stops here

- As inflammatory process extends through the full wall thickness, perforation can result
  - Microperforation
  - Large perforation
  - Free perforation
Complications of AD - Abscess/perforation

- When perforation of inflamed diverticulum takes place, localized phlegmon develops; further spread can result in abscess
- Microperforations can remain contained by pericolic fat and mesentery
  - Result is small pericolic abscess
- Large perforations can result in extensive local or distant abscess
- Free perforation of an uninflamed diverticulum can cause frank peritonitis
  - Rare (1-2%) but high mortality
- Most common cause of colonic perforation (60%)
Complications of AD/ Fistula

• Diverticular phlegmon/abscess extends or ruptures into adjacent organ

• Colovesicular- most common (up to 65%)
  • Males 2:1
  • Pneumaturia, fecaluria

• Colovaginal- 25%
  • Passage of stool or flatus via vagina
  • Frequent vaginal infections or copious discharge

• Coloenteric, colouterine, coloureteral, colocutaneous
Complications of AD/Obstruction

• SBO or ileus
  • Compression from peridiverticular abscess
  • Improves as inflammation subsides
• Partial colonic obstruction
  • Luminal narrowing from pericolic inflammation or compression from abscess
• High-grade colonic obstruction
  • Abscess or edema
  • Stricture formation after repeated episodes of AD
Hinchey Classification of Peritonitis

- Stage 1 - small, confined pericolic or mesenteric abscess
- Stage 2 - larger abscess, often confined to pelvis
- Stage 3 - perforated diverticulitis. Peridiverticular abscess has ruptured and caused purulent peritonitis
- Stage 4 - rupture of uninflamed and unobstructed diverticulum into free peritoneal cavity with fecal contamination (free perforation)

- Risk of death: <5% for most with stage 1 or 2
  13% for stage 3
  43% for stage 4
To image or not to image?

• Some treat w/o imaging if known diverticulosis and signs of uncomplicated diverticulitis
• Misdiagnosis rate can be high in women and pts <40 yrs
  • Combination of all signs/symptoms uncommon
• Survey of GIs and surgeons
  • 18% GIs and 39% surgeons considered CT scan mandatory
  • 16% non-GI surgeons used no imaging at all
Abdominal X-ray

- Abnormalities in 30-50%
  - Small bowel obstruction
  - Ileus
  - Large bowel obstruction
  - Pneumoperitoneum
  - Portal venous gas
  - Soft tissue densities
Contrast Enema

• Historical gold standard; falling out of favor
• Low morbidity, low cost, available, easy to perform

• Findings
  • Fold thickening
  • Fistula
  • Mass effect from abscess
  • Extraluminal free or contained contrast

• Most useful in setting of chronic diverticulitis, cases when AD not seen on CT, or to differentiate AD from carcinoma
CT Abdomen/Pelvis

- Gold standard
- Sensitivity 79-99%; specificity 75-100%
- Confirms diagnosis of diverticulitis
- Evaluates severity and extent of disease
- Allows for treatment planning of complications
- Demonstrates other causes of abdominal pain
CT Abdomen/Pelvis

- American College of Radiology rates CT of the abdomen/pelvis with oral and/or colonic contrast as the preferred procedure in the setting of LLQ pain w/ or w/o fever, except in women of childbearing age when US is the initial preferred modality for unexplained LLQ pain

- Oral contrast often does not reach sigmoid by time imaging performed
- Rectal contrast improves colonic distention, opacifies fistula tracts
- IV contrast identifies abscesses and demonstrates enhancement of colonic wall
- IV contrast useful in identification of other disease entities
CT findings in AD

- Soft tissue density in pericolic fat (98%)
- Presence of colonic diverticula (84%)
- Bowel wall thickening >4 mm (70%)
- Phlegmon and pericolic fluid (35%)

Complications

- Abscess
- Fistula
- Bowel obstruction
- Contained or free extraluminal air
- Contrast extravasation

CT findings insufficient to exclude cancer in 10%
Graded compression ultrasound

• Sensitivity 77-98%; specificity 80-99%

• Findings:
  • Hyperechogenic thickening of bowel wall
  • Pericolonic fat inflammation
  • Target-like appearance in transverse view
  • Abscess

• Not as sensitive as CT for:
  • Demonstration of alternative diagnosis
  • Demonstration of extent of large abscesses
  • Detection of free air
MRI

- Sensitivity 86-94%; specificity 88-92%
- Findings- bowel wall thickening, pericolic fat stranding, presence of diverticula, complications

**Advantages**
- Superior soft tissue resolution
- Lack of radiation
- Operator independent

**Disadvantages**
- Time consuming
- Expensive
- Poorly tolerated by acutely ill
- Unable to percutaneously drain
Treatment

• Bowel rest
  • NPO with IVF for hospitalized patients
  • Clears with slow advancement as tolerated for outpatients

• Antibiotics
  • IV or oral
  • Activity against anaerobes and Gram negative aerobes
  • Cipro/Flagyl, Bactrim/Flagyl, Augmentin (amoxicillin-clavulanate), Unasyn (Ampicillin-Sulbactam), Zosyn (piperacillin-tazobactam)
  • 7-10 days of therapy
  • Swedish study showed no benefit

• 70-100% of uncomplicated AD will improve with abx and bowel rest
IV or oral antibiotics?

• Mizuki et al
• Ridgway et al
• Alonso et al
• Etzioni et al

• Bottom line
  • “outpatient treatment of acute uncomplicated diverticulitis may be a feasible treatment strategy for certain patients: those who are able to tolerate oral intake, have no significant comorbidities, are able to obtain antibiotics, have adequate pain control, and have access to adequate follow-up and social support.”
To hospitalize or discharge?

- Hospitalize:
  - Failed outpatient therapy
  - Require IV analgesia
  - Unable to tolerate po
  - Complicated diverticulitis
  - Elderly
  - Immunocompromised (organ transplant, HIV, steroid use, chemotherapy, extracolonic neoplasia)
  - Significant comorbidities (DM, CKD, COPD)

- If discharge home, ensure adequate follow-up and social support
Treatment

• Abscess
  • CT guided drainage for abscess >3-5 cm
  • Smaller likely resolve with IV antibiotics

• Surgical evaluation
  • Fistula
  • Stricture
  • Obstruction
  • Perforation
  • Peritonitis
  • Large, undrainable abscess
  • Deterioration
  • Uncertain diagnosis

• ALL admitted patients with diverticulitis??
Surgery

• Required in 10-20% of patients overall
• Younger pts may need surgery 66-88% during initial attack
• Likelihood of surgery increases by at least 2 with each subsequent hospitalization
• Decision to perform elective colectomy left to surgeons
Follow-up

- Colonoscopy six weeks after resolution to r/o carcinoma or IBD
  - Not recommended during acute phase due to risk of perforation
- After resolution:
  - 30-40% remain asymptomatic
  - 30-40% have episodic cramps without clinical evidence of recurrent diverticulitis
  - 30% will have recurrent diverticulitis
- Among those who have surgery:
  - 15% develop diverticula in remaining colon
  - 2-11% will need further surgery
  - 27% have postop pain in same location
References


References


