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San Francisco

# GI Surgery Case Presentations

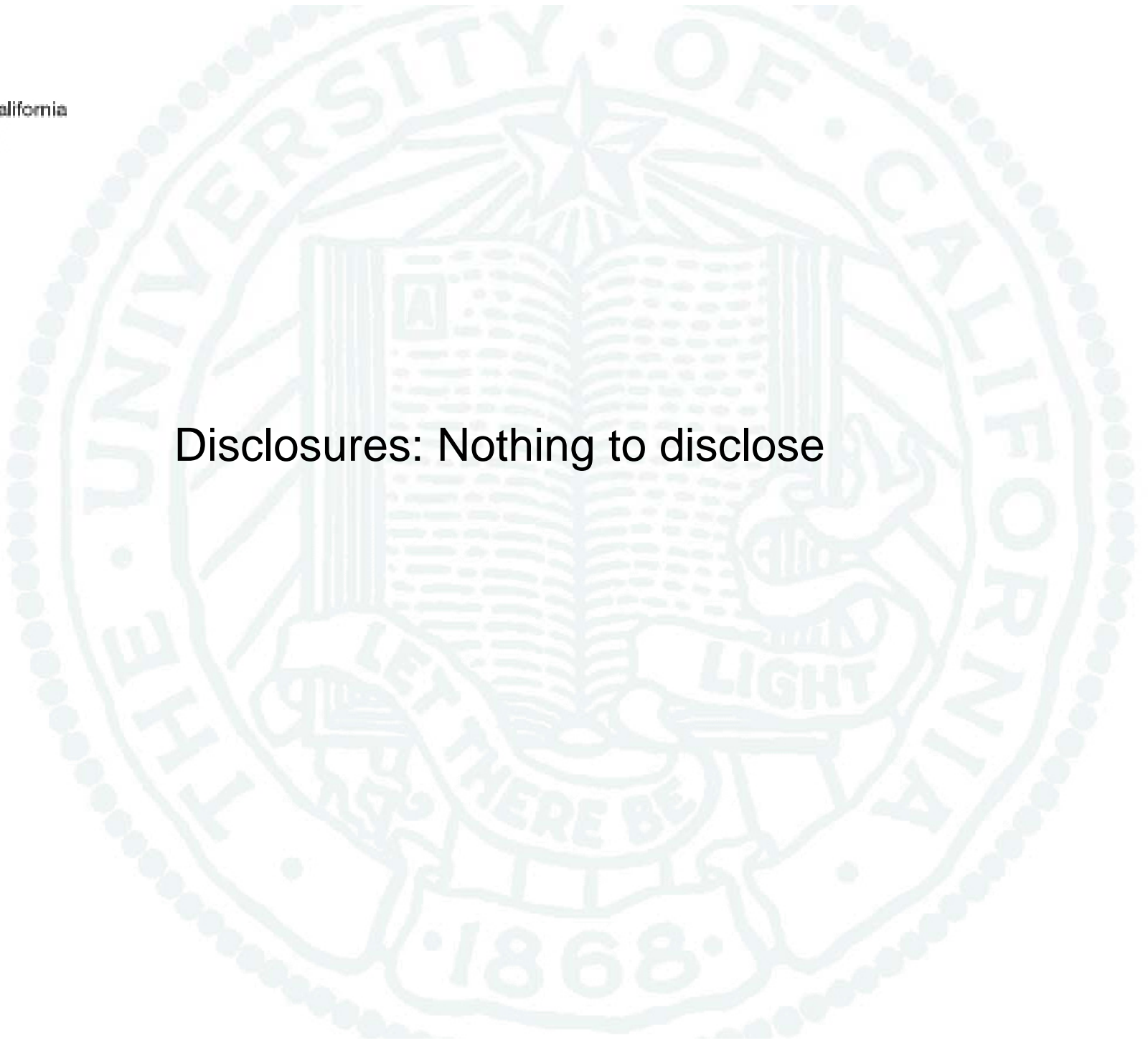
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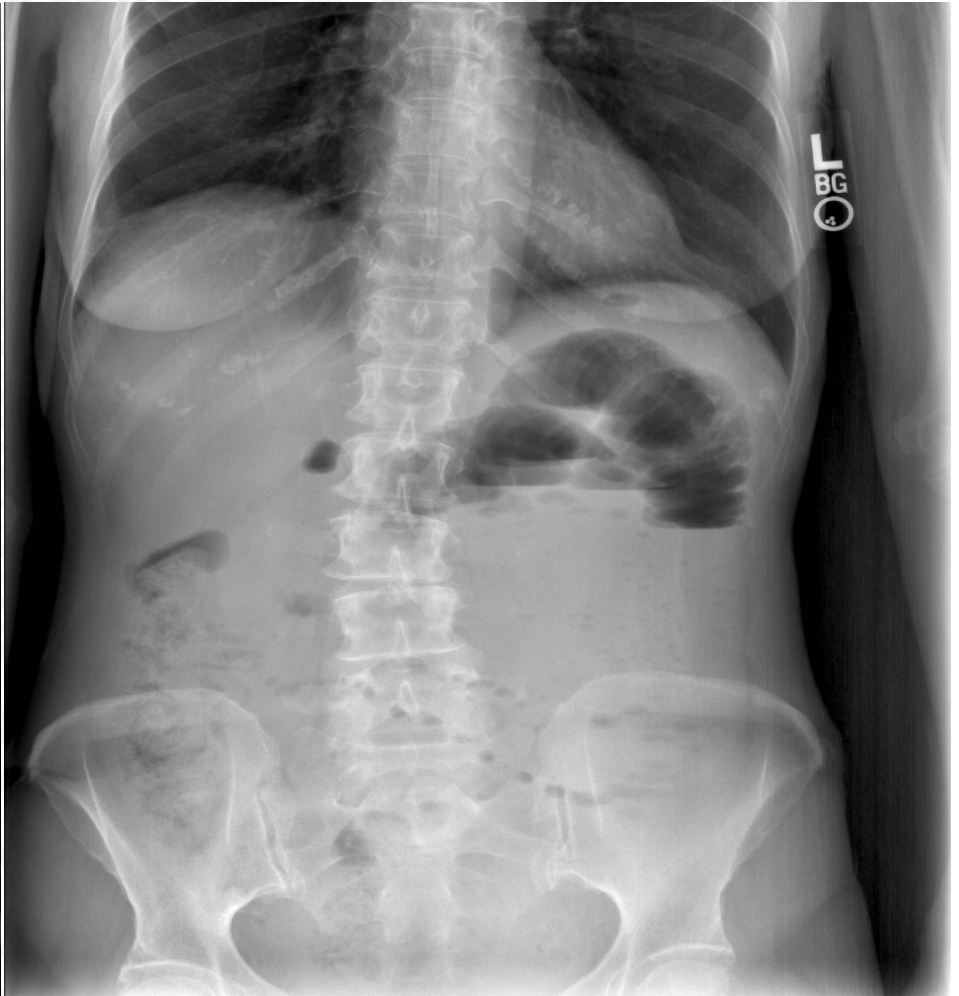


Disclosures: Nothing to disclose

# Case Presentation

- 62 year old woman presents with acute onset of crampy abdominal pain, distention and subsequent nausea and vomiting.
- Last BM was 8 hours ago and no recent flatus
- PSH: hysterectomy 15 years ago
- Afebrile, normal vitals and abdomen is soft, but diffusely tender and distended

# Abdominal plain films



# CT abdomen and pelvis



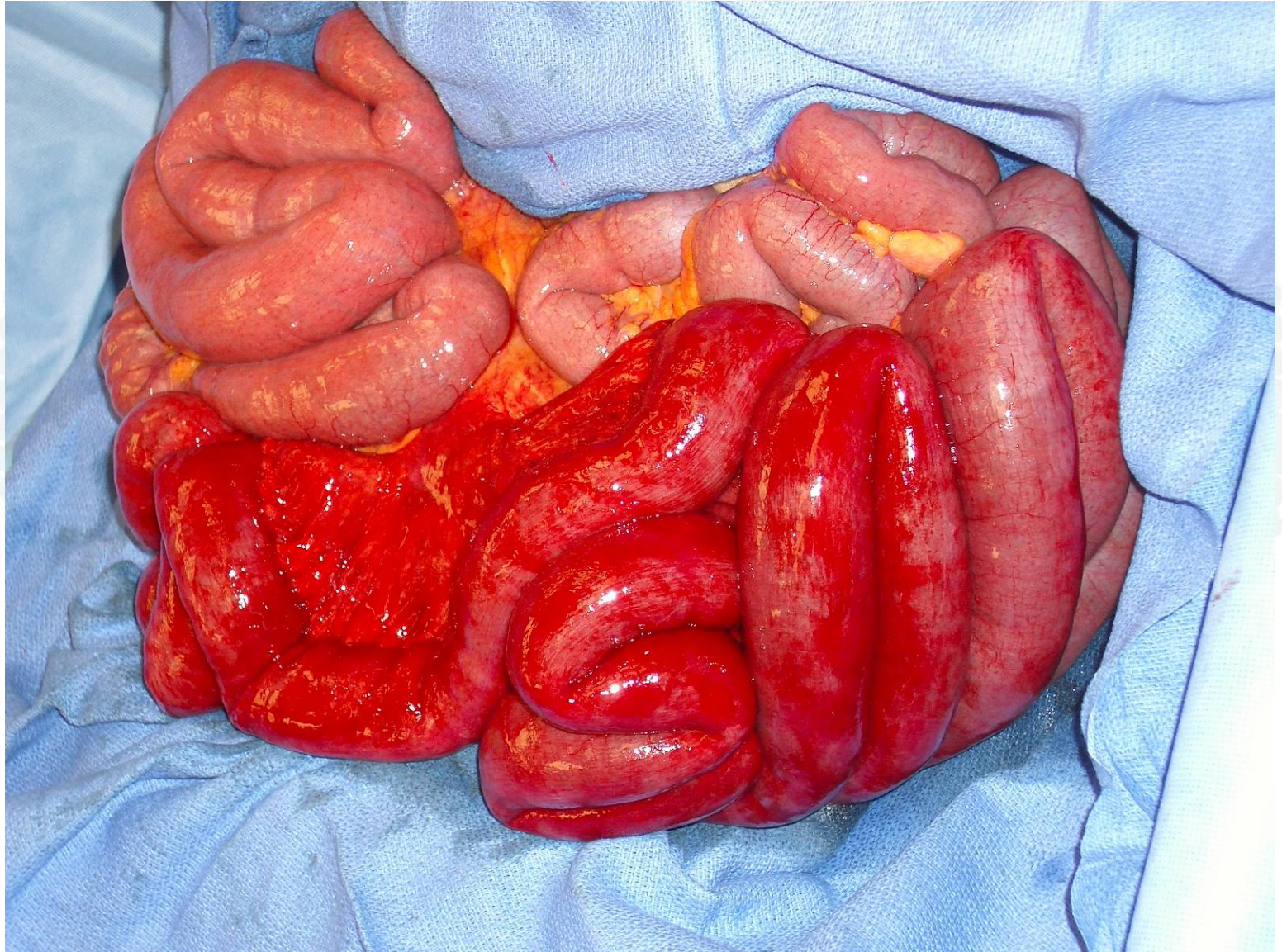
bowel wall edema, collapsed colon  
small bowel fecalization present

- What is the cause of the patient's intestinal obstruction?
- When do you need to operate immediately?
- How long should non-operative management be tried in those that do not need immediate operation?
- Can adhesiolysis reduce the risk of recurrent SBO?

## What is the cause of the patient's intestinal obstruction?

Etiology	Incidence, %
Adhesions	60
20% within 1 month of surgery	
30% within 1 year of surgery	
25% years 1-5	
25% after 5 years	
Cancer	20
Hernia	10
Inflammatory Bowel Disease	5
Volvulus	3
Miscellaneous	2

Is the obstruction strangulating or non-strangulating?





## Is the obstruction strangulating or non-strangulating?

The “classic signs” of strangulating obstruction are:

- \* continuous (rather than colicky) pain
- \* fever
- \* tachycardia
- \* peritoneal signs
- \* leukocytosis

...but alone, or in combination, sensitivity / specificity low

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Silen et al., Strangulation obstruction of the small intestine.  
Arch Surg 1962;85:121-129.

*“The results of this study indicate that the clinical differentiation between simple and strangulating obstruction is often impossible.”*

## Predicting Strangulated Small Bowel Obstruction: An Old Problem Revisited

Tim Jancelewicz • Lan T. Vu • Alexandra E. Shawo •  
Benjamin Yeh • Warren J. Gasper • Hobart W. Harris

J Gastrointest Surg (2009) 13:93–99

- Retrospectively reviewed 192 cases operated on for a small bowel obstruction (1996-2006) at UCSF Medical Center.
- A predictor model was created based upon operative findings: strangulated (n=44) or non-strangulated (n=148).
- Independent Predictors of strangulation: WBC > 12K, Rebound/Guarding at PE, Reduced Enhancement of SB at CT.

**Table 3** Sensitivity, Specificity, and Likelihood Ratios of Parameters Found in the Multivariate Analysis to be Significant Indicators of Bowel Strangulation

Findings	Sensitivity	Specificity	Likelihood ratio
CT: reduced enhancement only	56%	94%	9.3
Guarding only	39%	86%	2.8
WBC >12 only	45%	74%	1.7
WBC >12 and CT: reduced enhancement	20%	100%	Infinite
WBC >12 and guarding	18%	97%	6.0
Guarding and CT: reduced enhancement	16%	100%	Infinite
WBC>12, guarding, and CT: reduced enhancement	4%	100%	Infinite



The best initial study is a CT abdomen/pelvis with IV contrast and without (positive) oral contrast



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Can any tests differentiate patients whose obstruction will resolve non-operatively?

## OLD: CLINICAL PRESENTATION

*Complete obstruction = absence of significant flatus or stool for 12 hours and no colonic gas seen on KUB.*

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Complete obstruction = 20% success rate with non-operative treatment, 20-40% risk of strangulation

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Partial obstruction = 80% success rate with non-operative treatment, low risk of strangulation (3-6%)



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Can any tests differentiate patients whose non-strangulating obstruction will resolve non-operatively?

## NEW: ORAL WATER SOLUBLE CONTRAST ADMINISTRATION

*Instill 50-150cc of gastrograffin (water-soluble contrast) orally or via NGT. Obtain abdominal plain films at 4, 8, and/or 24 hours*

Presence of gastrograffin in the colon at 8 hours predicts non-operative resolution with 95% sensitivity and 99% specificity. PPV = 99%, NPV = 85%.

At 24 hours, 99% sensitivity, 97% specificity, 99% PPV, 97% NPV

Meta-analysis

**Systematic review and meta-analysis of the diagnostic and therapeutic role of water-soluble contrast agent in adhesive small bowel obstruction**

B. C. Branco<sup>1</sup>, G. Barmparas<sup>1</sup>, B. Schnüriger<sup>1</sup>, K. Inaba<sup>1</sup>, L. S. Chan<sup>2</sup> and D. Demetriades<sup>1</sup>

Divisions of <sup>1</sup>Trauma, Emergency Surgery and Surgical Critical Care, and <sup>2</sup>Biostatistics and Outcomes Assessment, University of Southern California, Los Angeles, California, USA



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How long should non-operative management be tried?

85-95% of patients with adhesive SBO who are destined to recover without surgery will show marked improvement within 72 hours

EAST guidelines 2009: 3-5 days

Bologna guidelines 2010: 3 days

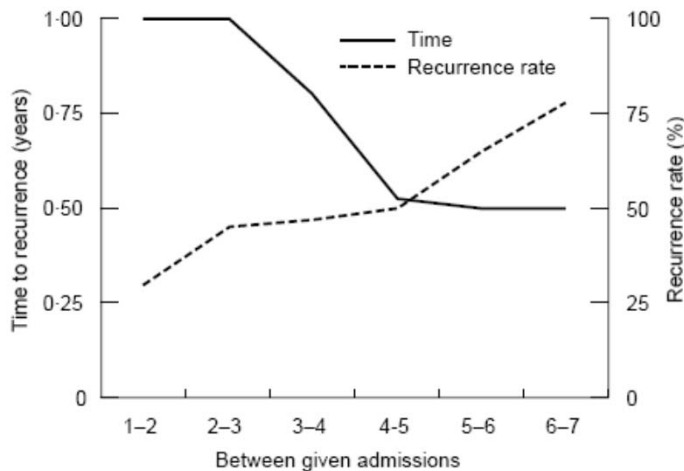
# Can adhesiolysis reduce the risk of recurrent SBO, readmission, or reoperation?

## Natural history of patients with adhesive small bowel obstruction

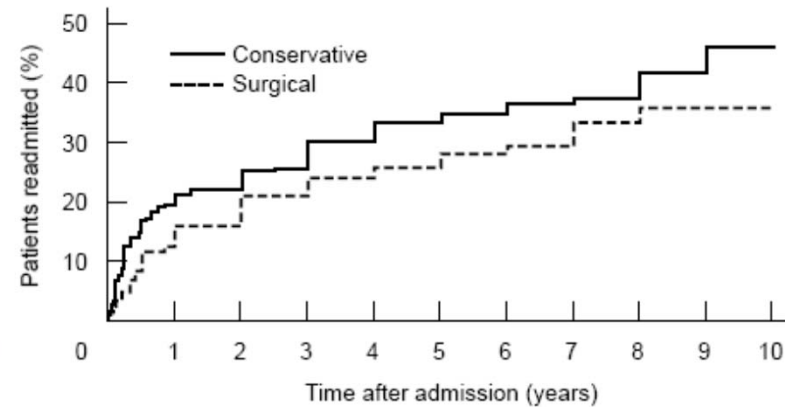
G. Miller, J. Boman, I. Shrier\* and P. H. Gordon

Division of Colorectal Surgery and \*Center for Epidemiology and Community Studies, Sir Mortimer B. Davis – Jewish General Hospital and McGill University, Montreal, Canada

British Journal of Surgery 2000, 87, 1240–1247



**Fig. 1** Median time to recurrence for successive hospitalizations and recurrence rate for further episodes of small bowel obstruction. For example, the median time between the first and second admission was 1 year and that between the fifth and sixth admissions was 0.5 years. The recurrence rate for individuals with one episode of small bowel obstruction ( $n = 137$ ) was 33 per cent and that for individuals with five episodes ( $n = 14$ ) was 64 per cent



Surgery...

had no effect on total readmissions (32% vs 34%) but spaced out readmissions over time (median 0.7 vs 2 years) and had no difference in reoperation rate (14% vs 11%)

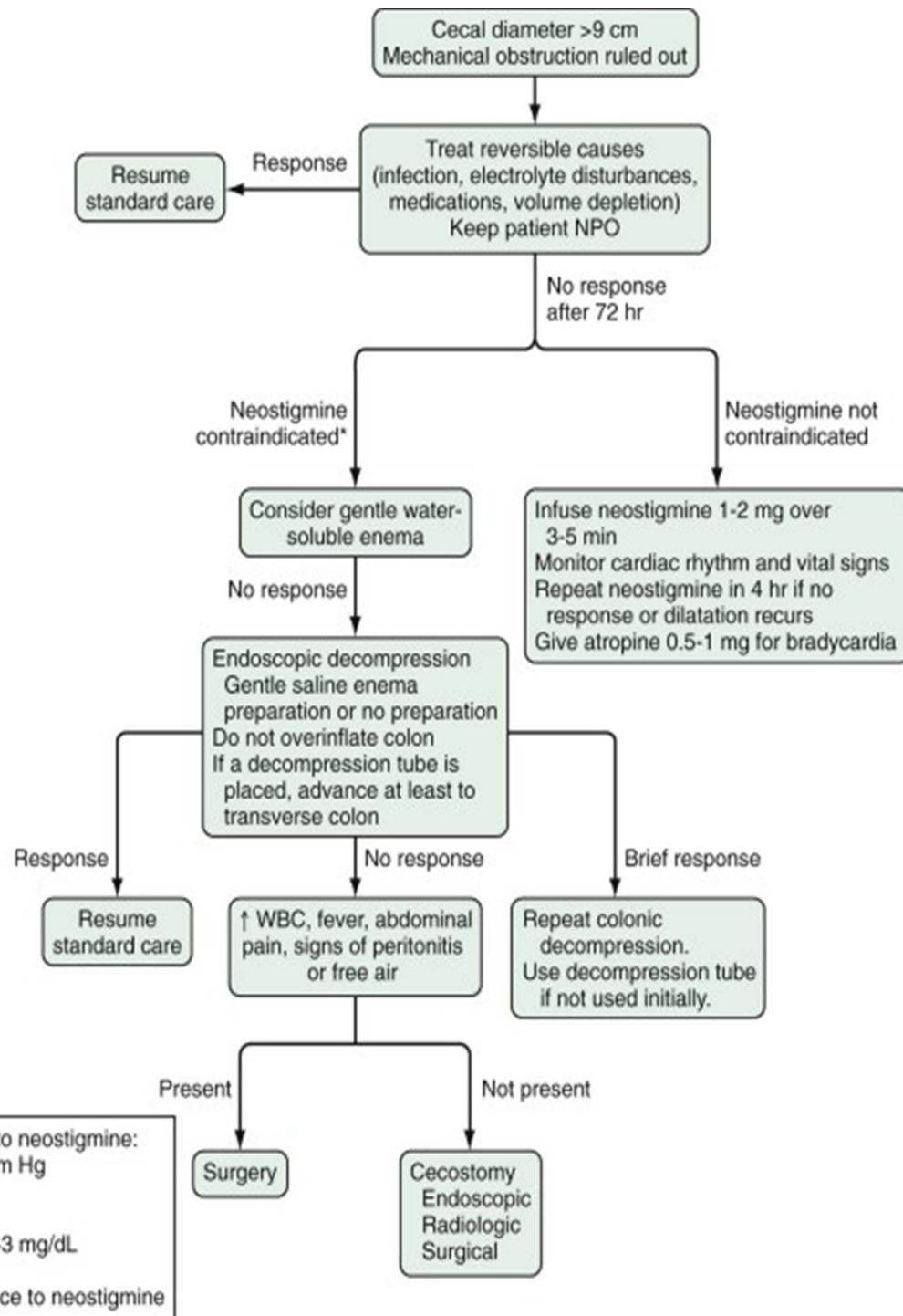
New Case: 75 year old man with 6 days after hip replacement with progressive abd distention, nausea and vomiting and no BMs for flatus for 3 days.





# Management?

- Ambulate
- Narcotics
- NG/Rectal Tube
- Miralax
- Reglan
- Linaclotide (Linzess, guanylate cyclase agonist)
- Relistor or Entereg (peripheral mu opioid receptor antagonists)



# Case Presentation

- 63 year old woman with several days of progressive LLQ pain, constipation and low grade fever.
- T 38.2, tender LLQ, localized peritoneal signs
- WBC = 15, 000

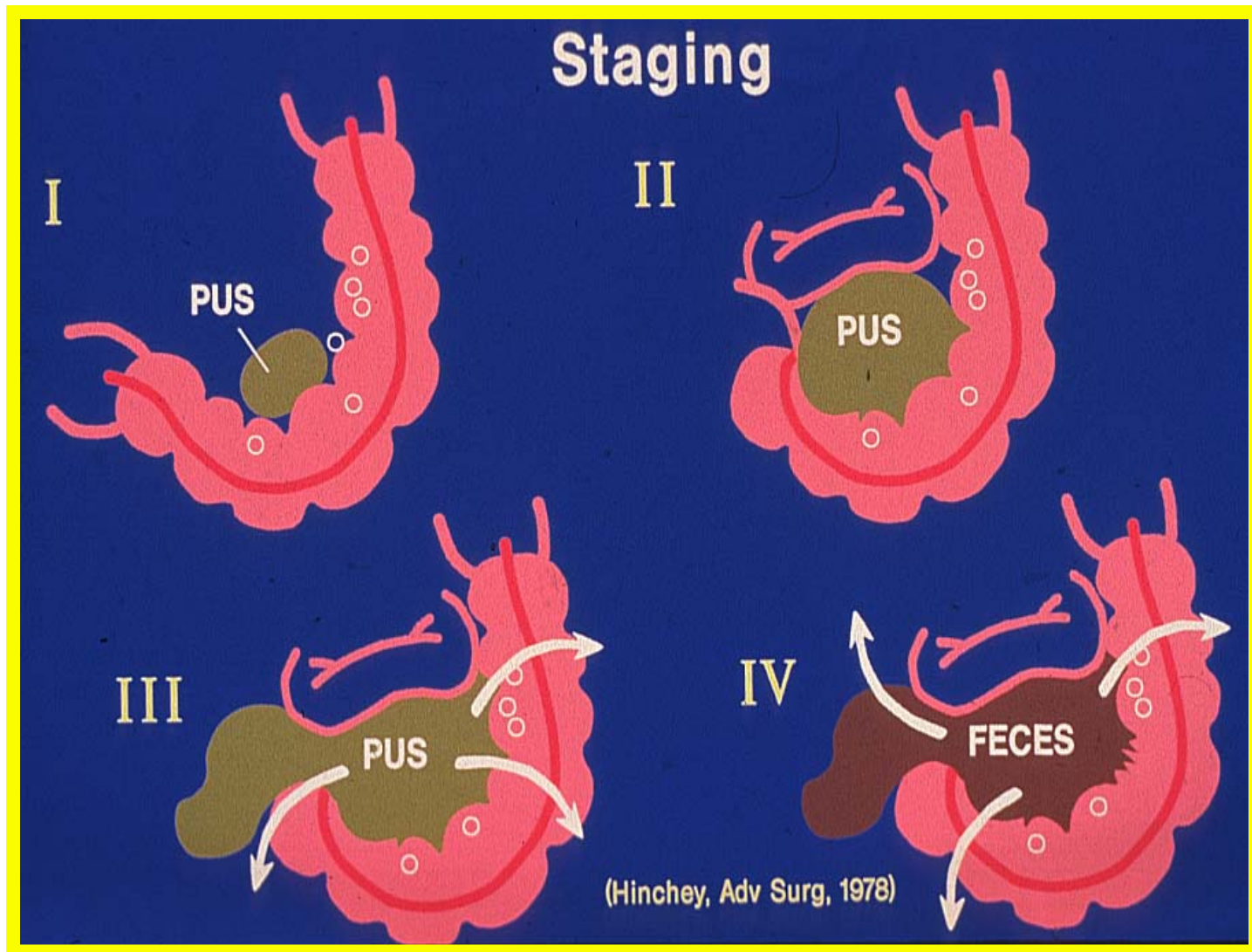


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# **Modern Treatment of Diverticulitis**

- **Increasing use of interventional radiology for the treatment of diverticular abscesses**
- **Resection and primary anastomosis during emergency surgery for complicated diverticulitis**
- **Laparoscopic approach for sigmoid colectomy**
- **Better knowledge of the natural history of the disease**

# Complicated Diverticulitis Hinchey Classification



# Management?

- Hospital admission?
- IV versus oral antibiotics?
- Diet?
- Catheter drainage?
- When to do colonoscopy?
- When to operate?

# When to operate?

## Emergency

- Free Perforation
- Diffuse Peritonitis
- Complete Colonic Obstruction

## Elective

- Multiple episodes
- Strictures, Fistulas
- Comorbidities

## Relative emergency

- Fail medical therapy
- Recurrence in the same admission
- Partial colonic obstruction
- Immunocompromised patients
- Unable to rule out carcinoma



# **Surgical Goals in Complicated Diverticulitis**

**Removal of diseased colon**

**Elimination of complications**

**(i.e. abscess/fistula)**

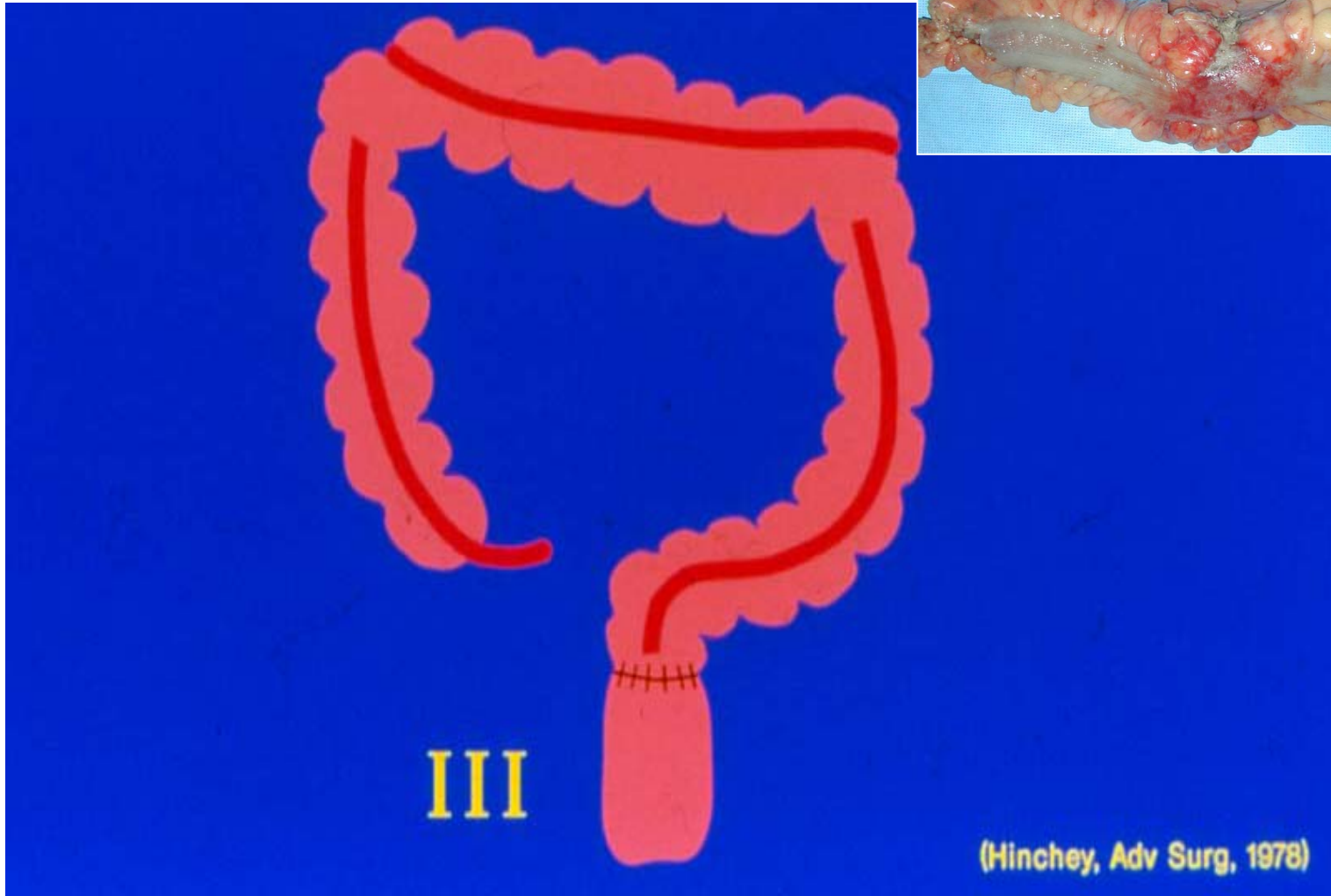
**Expeditious operation**

**Minimal morbidity**

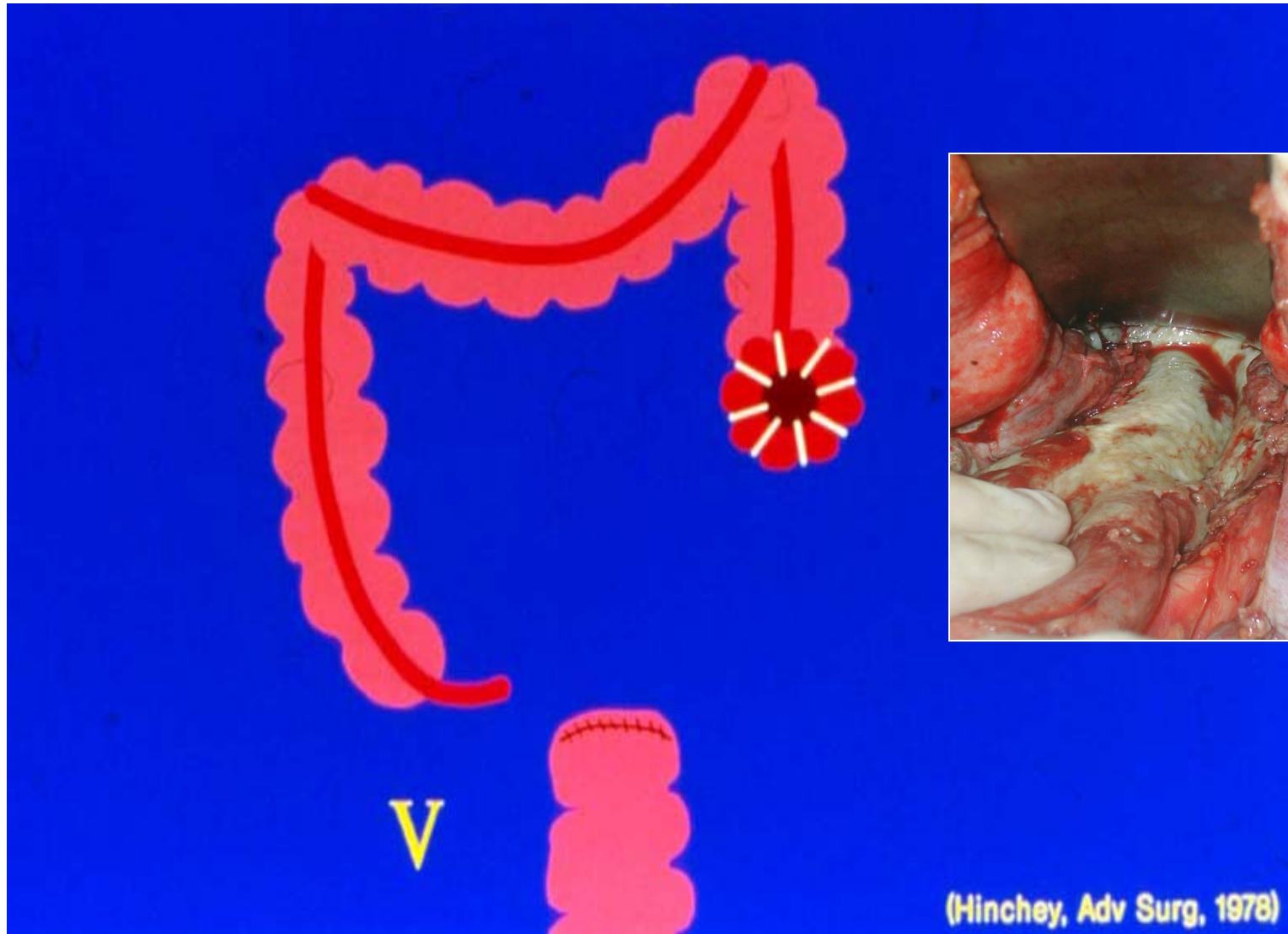
**Minimal hospital stay**

**Maximal patient survival**

# Resection and Primary Anastomosis



# Two stage: Hartmann Procedure



# Contraindications to Primary Anastomosis

## ABSOLUTE

Hemodynamic instability

Fecal peritonitis

Ischemia or edema

## RELATIVE

Unprepared colon\*

Immunosuppression

Radiation

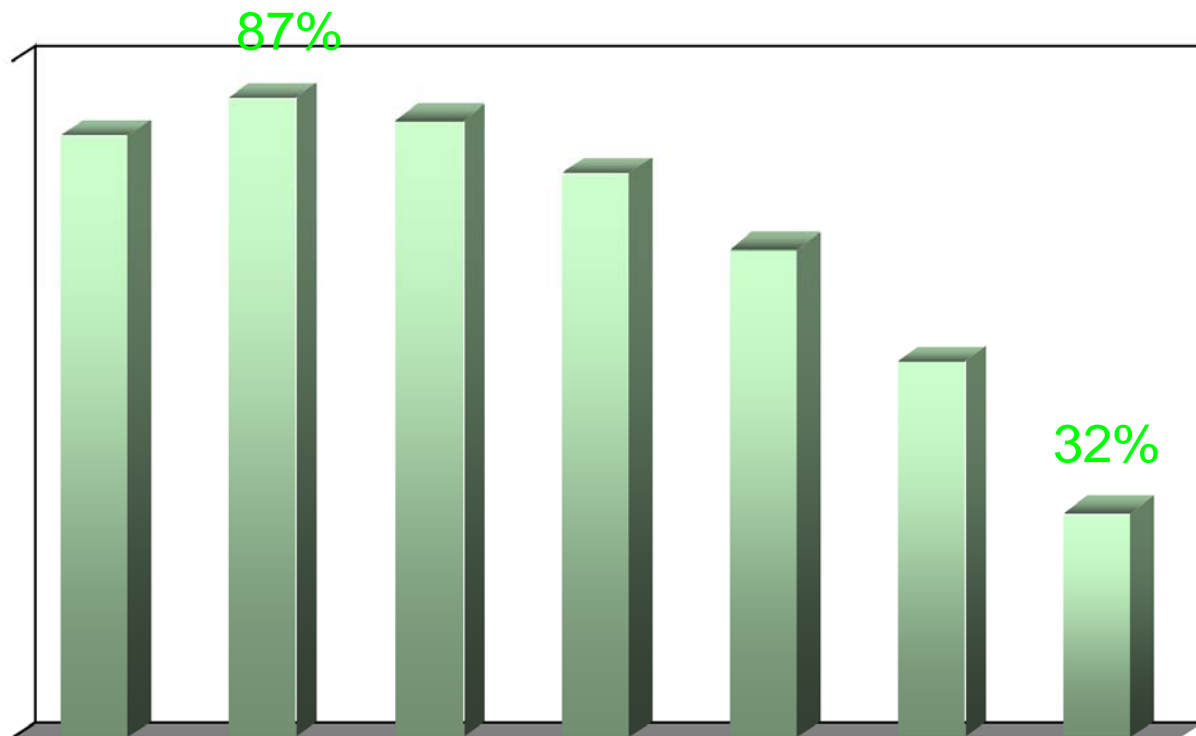
Anemia and malnutrition

Chronic abscess

Judgment of surgeon

# Reconstruction after Hartmann

Washington, 1987-2002



Salem L, et al. Dis Colon Rectum 2005

# Primary Anastomosis vs Hartmann (Hinchey III & IV)

Current Status

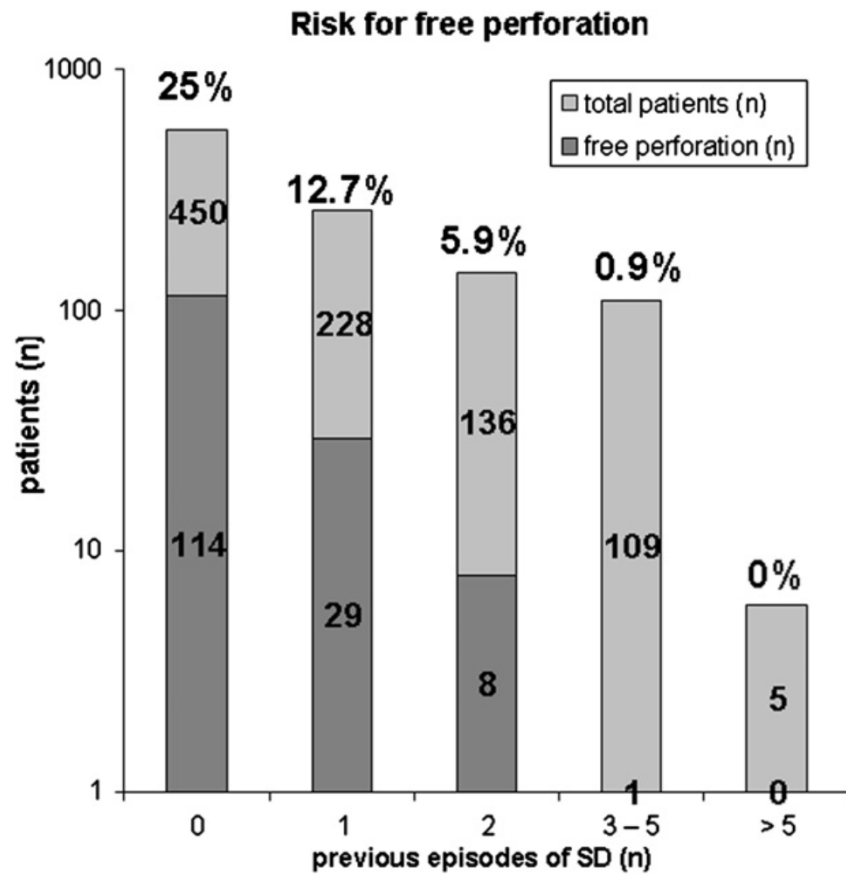
	<b>Series</b>	<b>#</b>	<b>Mortality</b>
<b>Hartmann</b>	<b>54</b>	<b>1051</b>	<b>19%</b> <b>(0-100)</b>
<b>Primary Anastomosis</b>	<b>50</b>	<b>569</b>	<b>10%</b> <b>(0-75)</b>

Salem L, et al. Dis Colon Rectum 2004

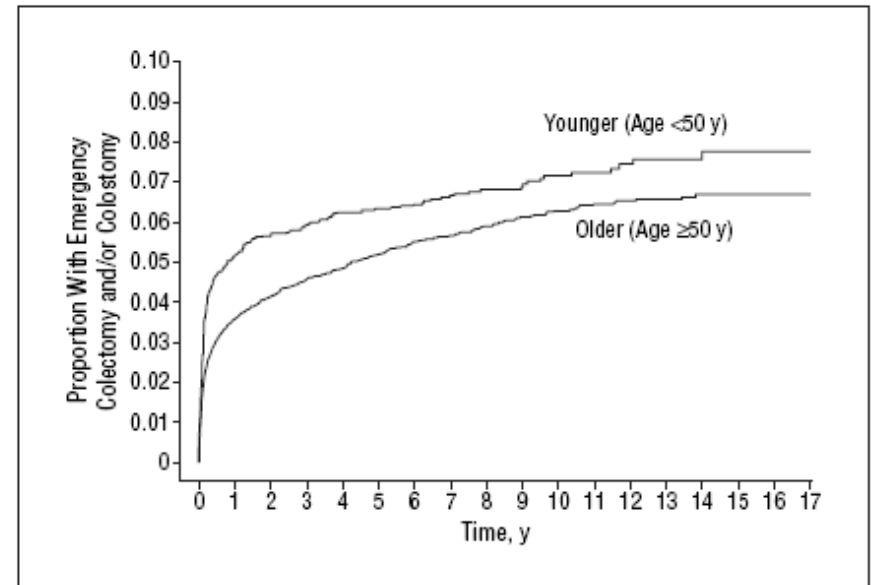
# Diverticulitis: Natural History

- 90% can be managed as outpatients
- 20-30% recurrence rate at 10 years
- 30% with chronic recurring symptoms
- After 2<sup>nd</sup> episode
  - 30-50% chance of 3<sup>rd</sup> episode
  - Greater chance of complication (abscess, obstruction, fistula)?
  - >75% with some chronic symptoms

# Risk of emergency surgery/colostomy



Ritz et al Surgery 2010



Anaya, Flum Arch Surg 2005



# Elective Surgery for Diverticulitis

Mortality,  
Morbidity,  
Colostomy  
and Costs  
of Elective  
Surgery

Risk  
of  
Future  
Attacks



Mortality,  
Morbidity,  
Colostomy  
and Costs  
of Emergency  
Surgery



Salem et al, J Am Coll Surg 2004

# **Elective Surgery for Diverticular Disease**

## **Factors to consider**

- **Number and severity of attacks**
- **Interval between episodes**
- **Symptoms between episodes**
- **Age**
- **Co-morbid conditions**

# **Elective Surgery for Diverticular Disease**

**All this in the context of**

- **More effective non-invasive treatment of complicated diverticulitis**
- **Lower probability of colostomy with emergency surgery**
- **Advantages of the laparoscopic sigmoid colectomy**

# Diverticulosis: A chronic medical illness

- 50-70% of adults have diverticulosis
- < 5% will develop acute diverticulitis
- Non operative prevention of acute diverticulitis?
- SCAD
- SUDD
- Role of fiber, mesalamine, rifaximin, probiotics

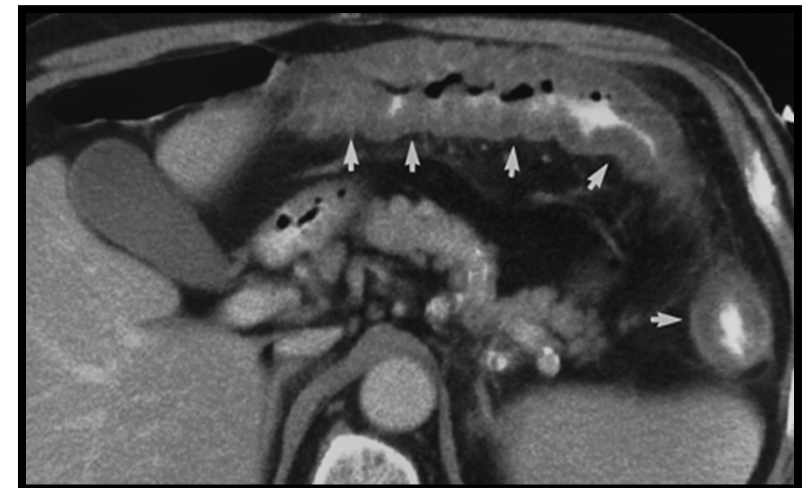
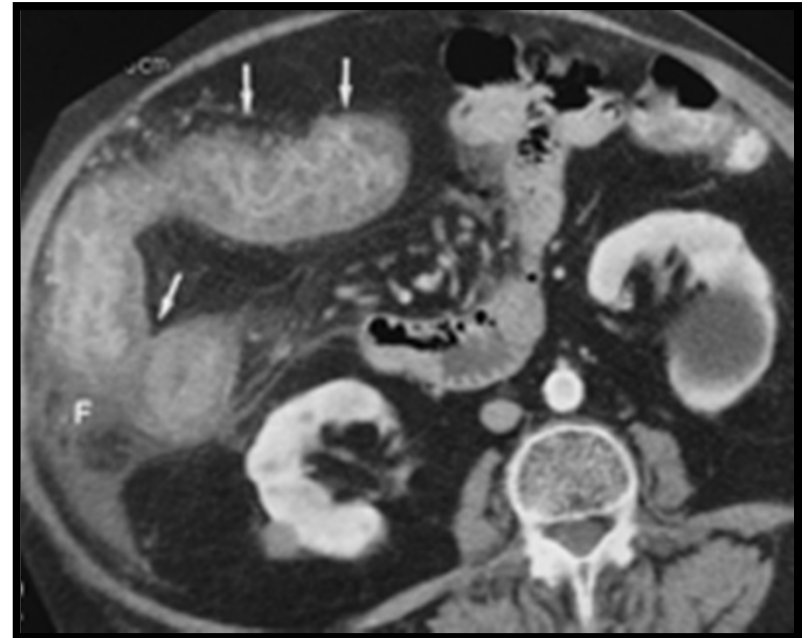
# Case Presentation

- 82 year old man presents with acute onset of crampy left lower quadrant abdominal pain, urgency with multiple low volume bloody BMs
- T = 37.8, HR 95, BP 170-80, mild to moderate LLQ tenderness
- WBC = 14, 000, Hct = 36

# Diagnosis?

## Ischemic colitis

- CT often the initial test
- Typical Findings of IC
  - Mural thickening
  - Thumbprinting
  - Pericolonic fat stranding
  - Peritoneal fluid
  - Double halo or target sign
    - Submucosal edema & hemorrhage
  - Lack of bowel wall enhancement
  - No major mesenteric vessel occlusion



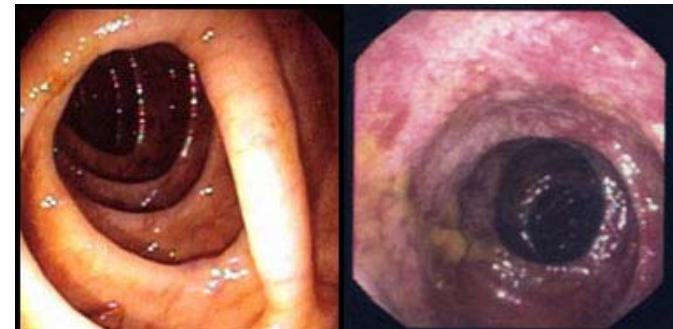
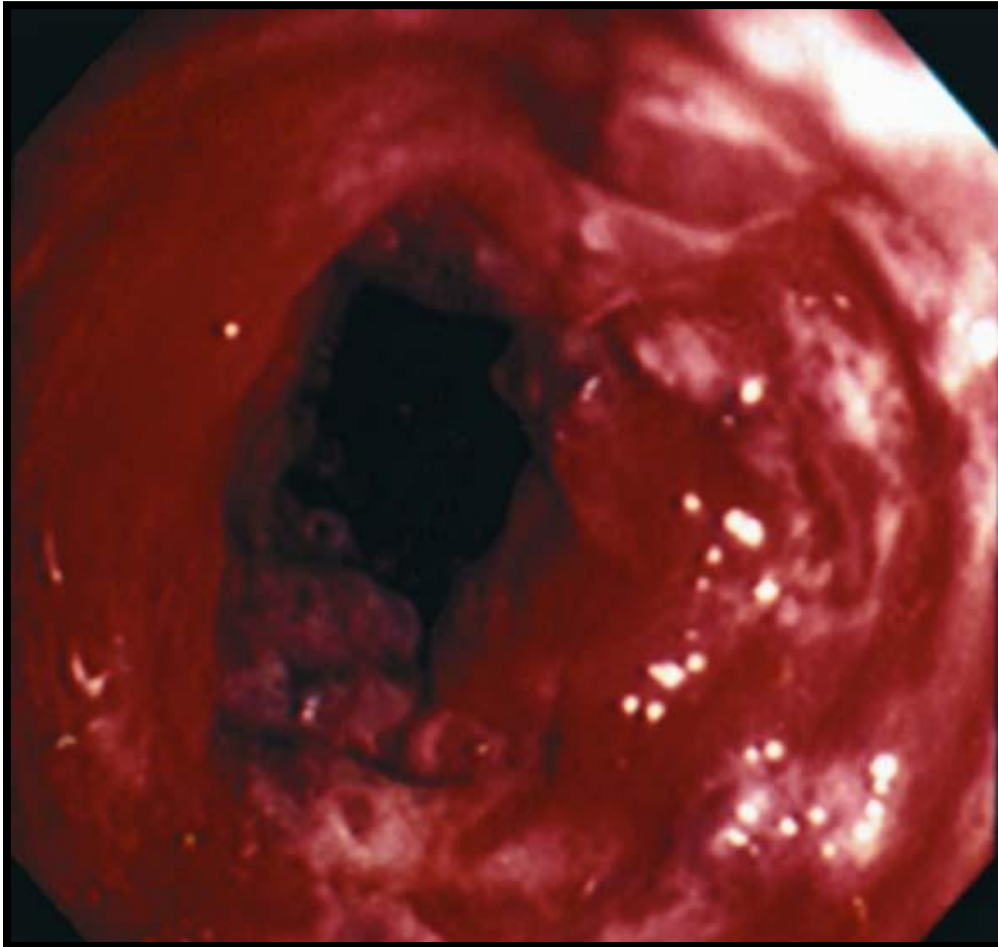
# Colonoscopy

Colonoscopic findings are suggestive but are not diagnostic of IC

- CT first
- Submucosal hemorrhage
- Ulcerations
- Friability
- Mucosal necrosis
- Segmental distribution
- Rectal sparing

Endoscopy has a diagnostic accuracy of 92% and a negative predictive value of more than 94%

# Mucosal Edema, Exudates, and Ulcerations





# Differential Diagnosis

	<b>Clinical</b>	<b>Radiologic/Endoscopic</b>
<b>Ulcerative colitis</b>	Bloody diarrhea	Extends proximally from rectum; mucosal ulceration, chronic changes on bx
<b>Crohn's colitis</b>	Perianal lesions common; frank bleeding less frequent than in ulcerative colitis	Segmental disease; rectal sparing; strictures, fissures, ulcers, fistulas; small bowel involvement
<b>Ischemic colitis</b>	Older age groups; vascular disease; sudden onset, often painful	Segmental; "thumb printing"; rectal involvement rare, acute inflammation, hemorrhage
<b>Infectious colitis</b>	+ stool cultures or C-dif toxin	Diffuse colon wall thickening involves the rectum, acute inflammation on bx

# Differential Considerations

- Atypical features for inflammatory bowel diseases
  - Segmental distribution of the disease, infrequent rectal involvement
  - High rate of spontaneous recovery, low rate of recurrence
  - Lack of adequate response to usual inflammatory bowel disease therapy
  - Frequent progression to fibrotic stenosis with delayed obstruction
- Always consider the diagnosis of ischemic colitis whenever contemplating the diagnosis of inflammatory bowel disease in an elderly patient

# Pathophysiology

- Intestinal blood flow is inadequate to meet the metabolic demands of a region of the colon
- IC can be occlusive or non-occlusive
  - almost always non-occlusive
- Compromised blood flow may be secondary to changes in systemic circulation or local mesenteric (micro) vasculature
- Most cases involve watershed areas
- The rectum is usually spared due to dual blood supply
  - Inferior mesenteric artery
  - Internal ileac branches

# Predisposing Conditions

- Age
- High blood pressure
- Cardiovascular disease
- Diabetes
- Chronic renal failure
- Chronic pulmonary disease
- Recent cardiovascular surgery
- Constipation

# Classification of Ischemic Colitis

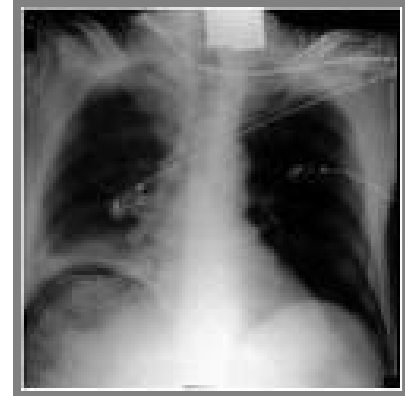
<b>Gangrenous 10-15%</b>	
<b>Complete loss of arterial flow causes bowel wall infarction and gangrene, which can progress to perforation, peritonitis, and death.</b>	
<b>Non-Gangrenous 85-90% (&gt; 90% in the ambulatory)</b>	
<b>Transient 80%</b>  <b>(recurrence is 10%/year)</b>	<b>Transient, reversible impairment of the arterial supply, with accompanying reperfusion injury.</b>  <b>Leads to partial mucosal sloughing that heals by mucosal regeneration in a few days.</b>
<b>Chronic 10%</b>  <b>Stricturing 10%</b>	<b>Gross impairment of the arterial supply, leading to hemorrhagic infarction of the mucosa. Can lead to chronic segmental colitis</b>  <b>Heals by fibrosis, and can lead to stenosis</b>

# Management

- Depends on clinical severity
- Most cases are transient and resolve spontaneously
- Mild cases require only supportive care
  - NPO?
  - Broad spectrum antibiotics?
  - Optimize cardiac function and oxygen delivery
  - Serial abdominal exams

# Indications for Surgery

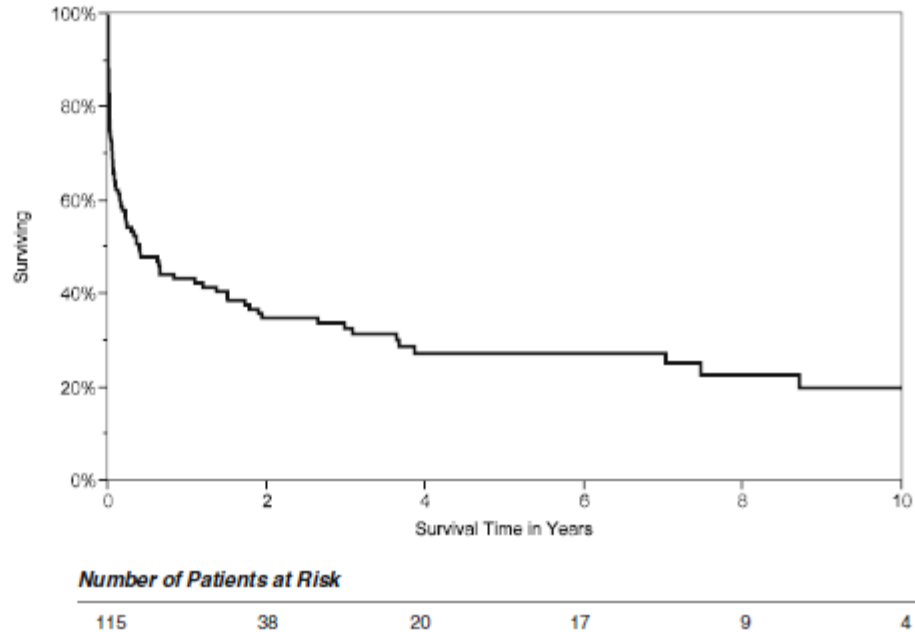
- Acute Ischemia
  - Pneumoperitoneum
  - Significant gangrenous IC on endoscopy
  - Clinical deterioration despite conservative measures
    - Peritonitis
    - Sepsis without other source
    - Persistent fever or leukocytes
  - Persistent pain, urgency, rectal bleeding or protein-losing colopathy for more than 14 (?) days



# Long term outcomes after operation: poor

J Gastrointest Surg

Fig. 1 Kaplan-Meier survival curve



37% in hospital mortality rate  
25% readmission rate  
24% had ostomy reversal  
80% mortality at 10 years