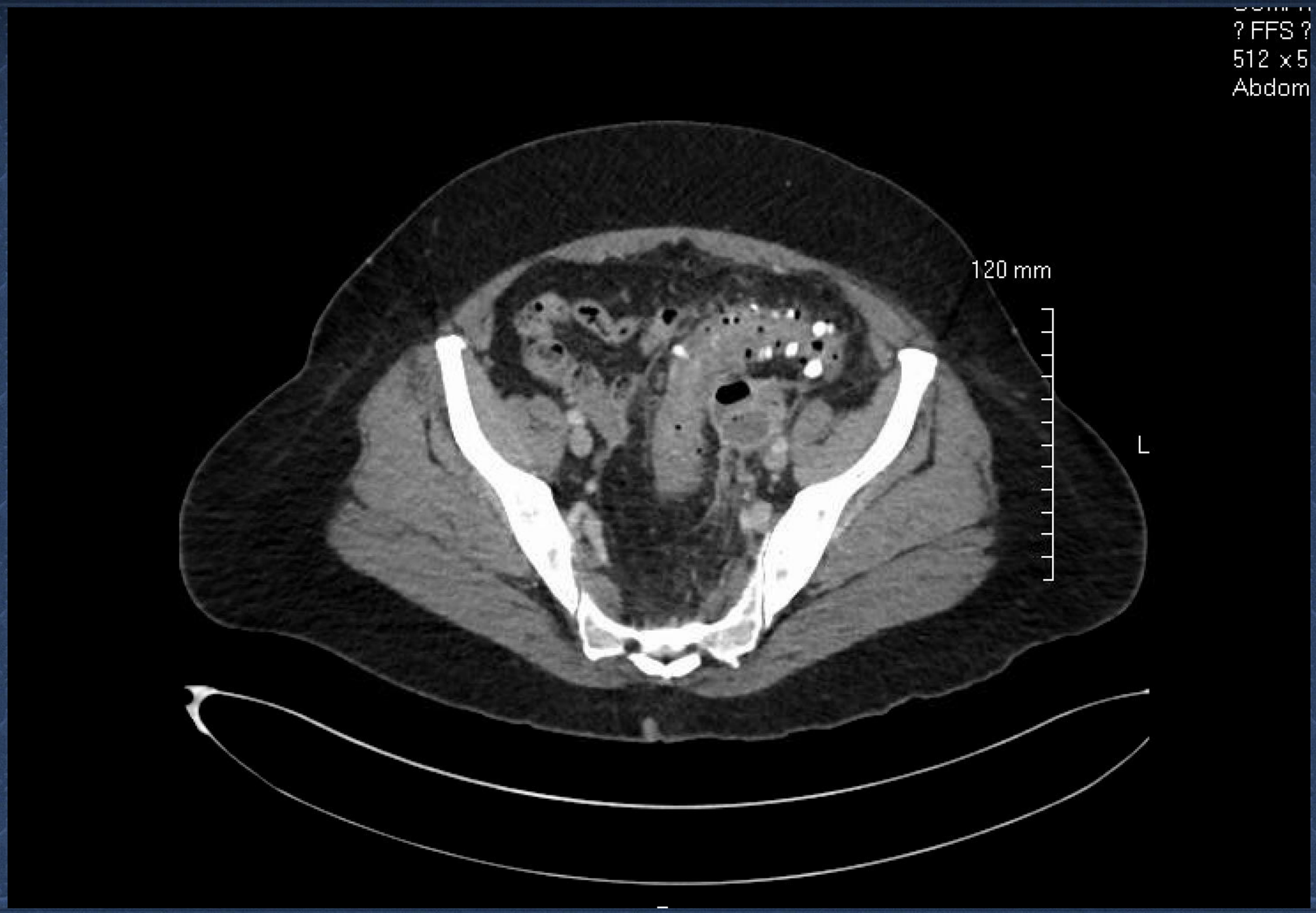
Surgical Treatment of Diverticulitis

Lisa Schomogyi, MD, FACS

July 15, 2016

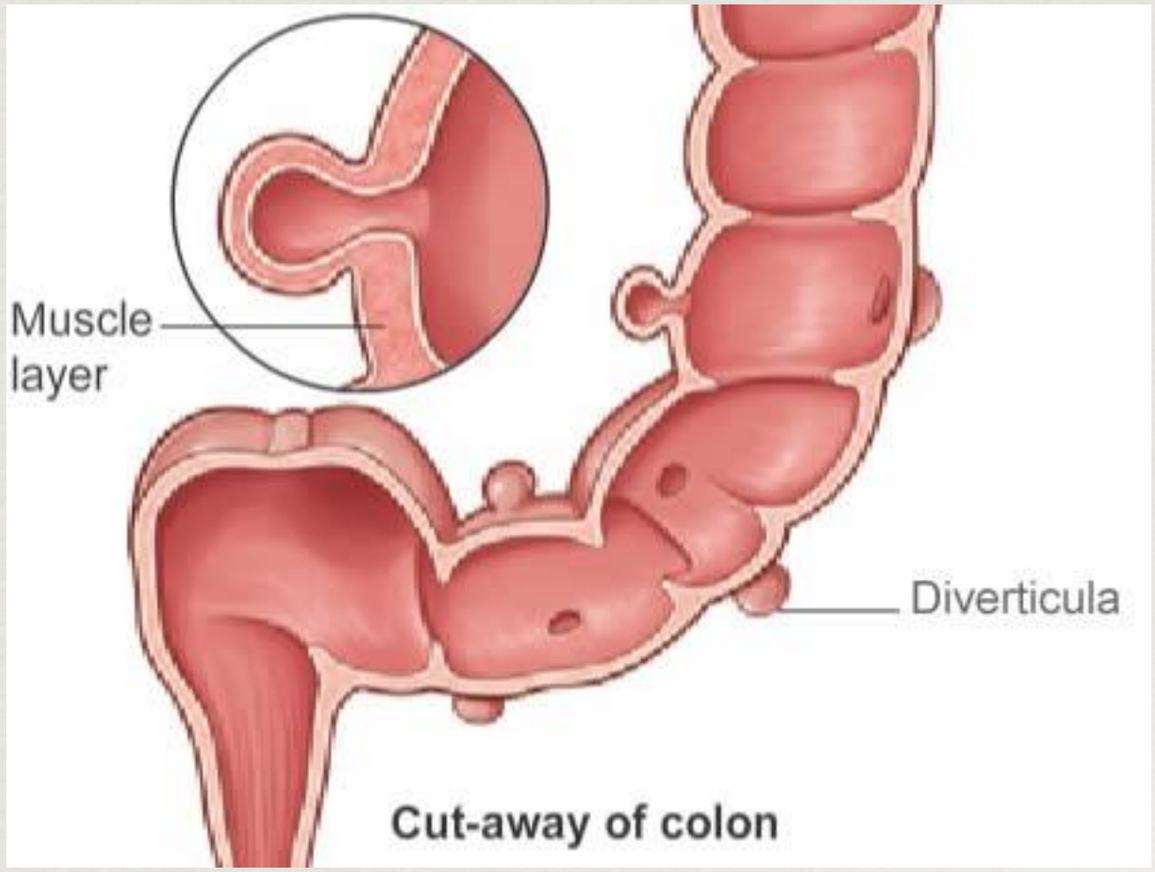


Diverticulitis with pericolonic abscess

What would you do?

Etiology of Diverticulitis

- Complex interaction
- low fiber diet/obesity
- ?genetic issues
- sedentary lifestyle
- smoking
- age
- all theories



Incidence

- 5-10% under age 50
- 30% after age 50
- 50% after age 70
- 66% after age 85
- true numbers uncertain without universal screening

Modified Hinchey Classification

- Stage 0 Mild clinical diverticulitis
- Stage 1a Confined pericolic inflammation, no abscess
- Stage 1b Confined pericolic abscess
- Stage 2a Distant abscess amenable to percutaneous drainage
- Stage 2b Complex abscess +/- fistula
- Stage 3 Generalized purulent peritonitis
- Stage 4 Feculent peritonitis, open communication with bowel lumen

CT-based Severity Grading

- Moderate Severity Grading
  - Localized thickening of colonic wall >4mm and signs of inflammation in pericolic fat
  - 4% failure of medical treatment at index episode
  - 17% initially nonoperative at index episode have recurrence or complication

Ambrosetti et al, Eur Radiol, 2002

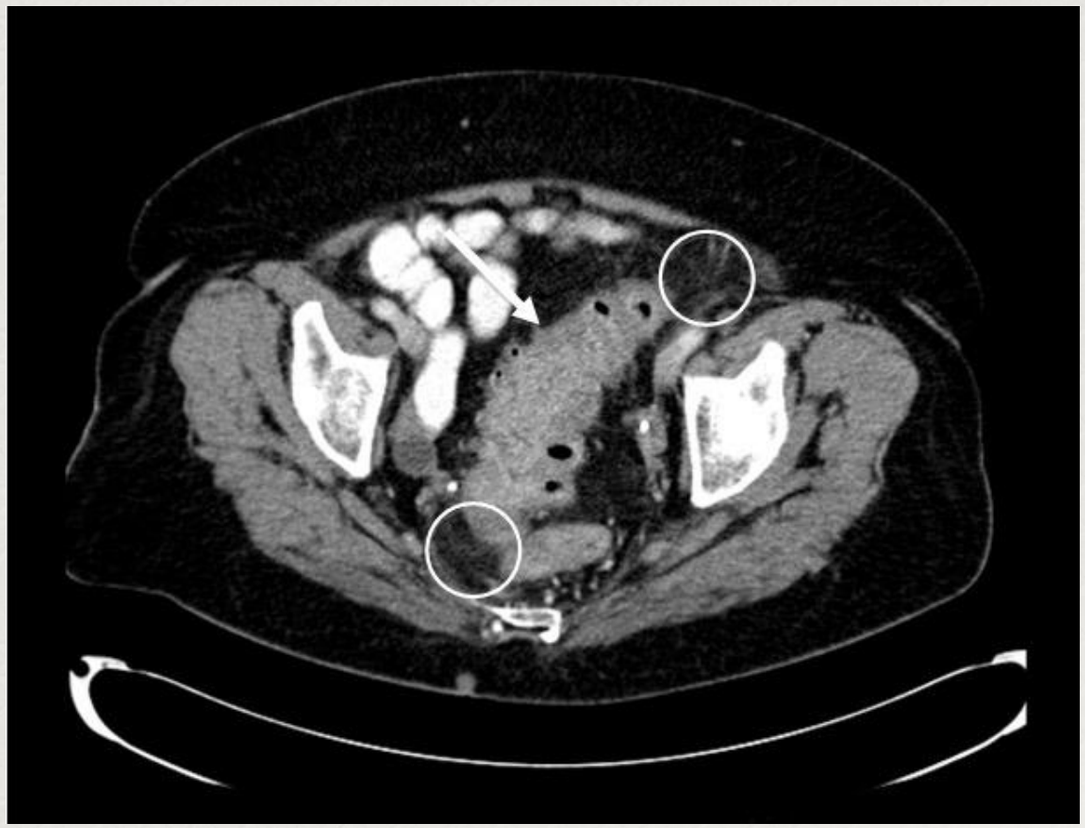
CT-based Severity Grading

- Severe Grading
  - moderate grade findings plus abscess, extraluminal air, and extraluminal contrast
  - 26% failure of medical treatment at index episode
  - 36% initially nonoperative at index episode have recurrence or complication

Ambrosetti et al, Eur Radiol, 2002

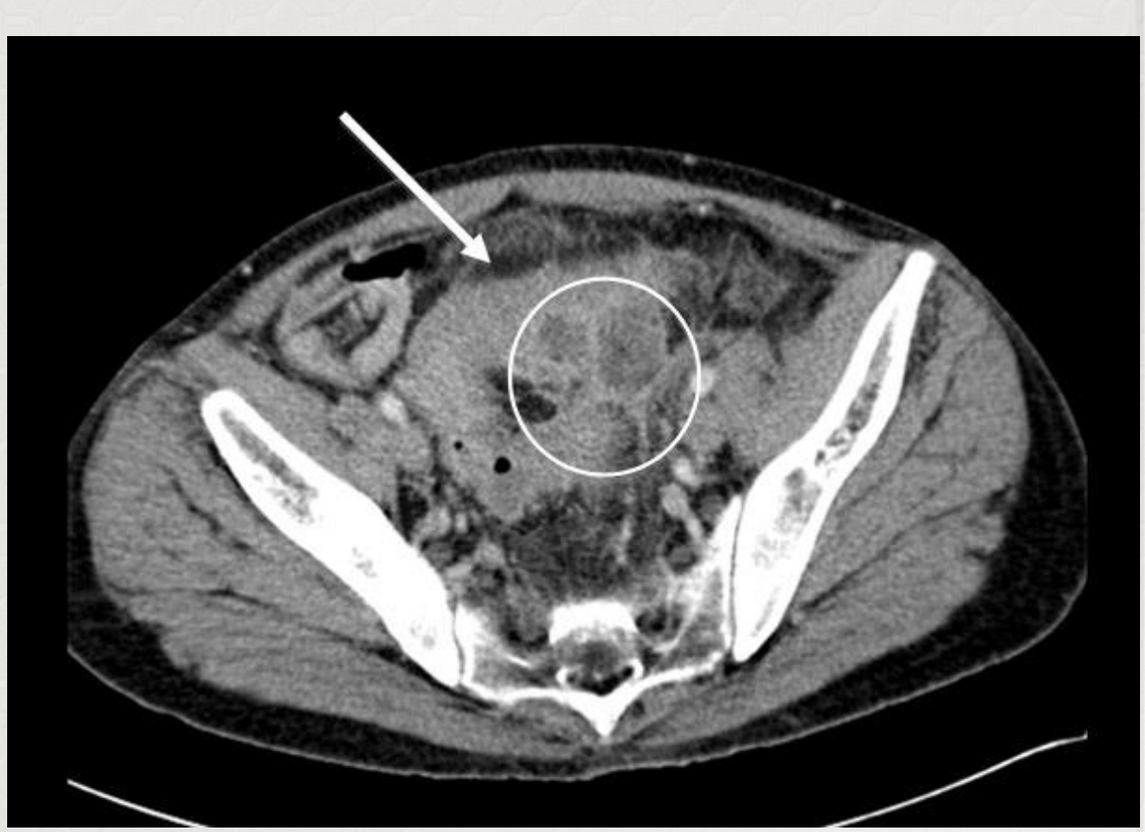
Uncomplicated Diverticulitis

- Mural thickening
- fat stranding
- often outpatient treatment
- rarely requires surgery
- Stage 0
- moderate CT grade



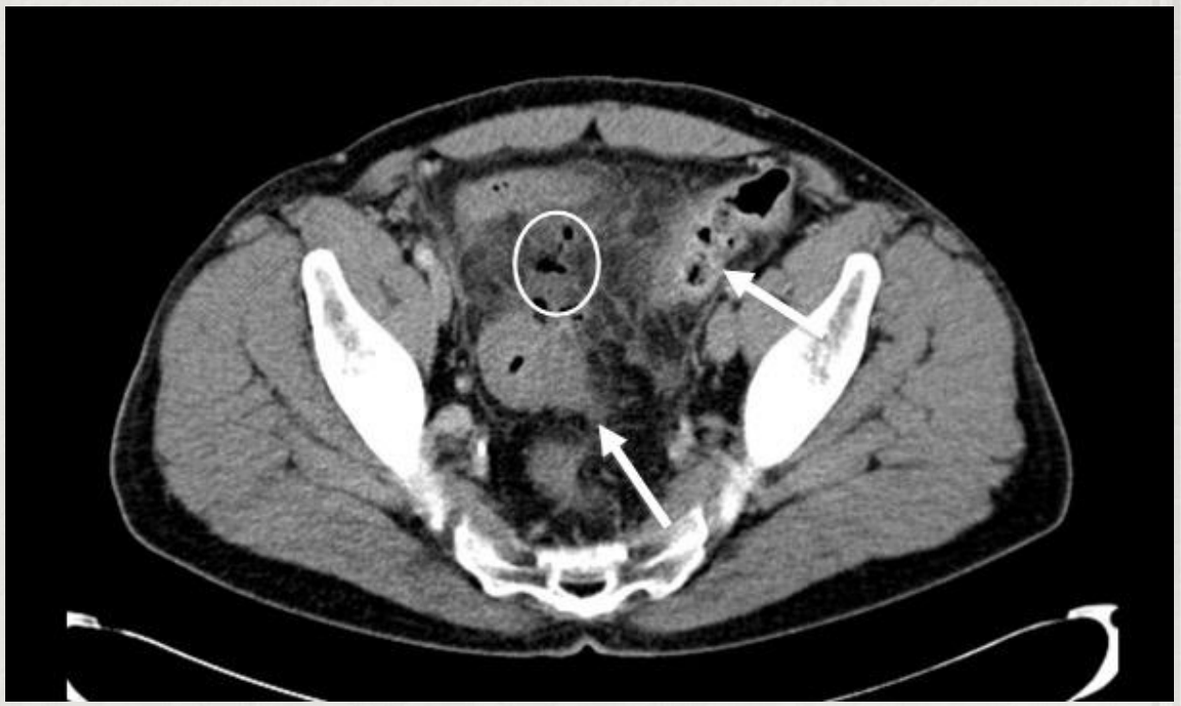
Complicated Diverticulitis

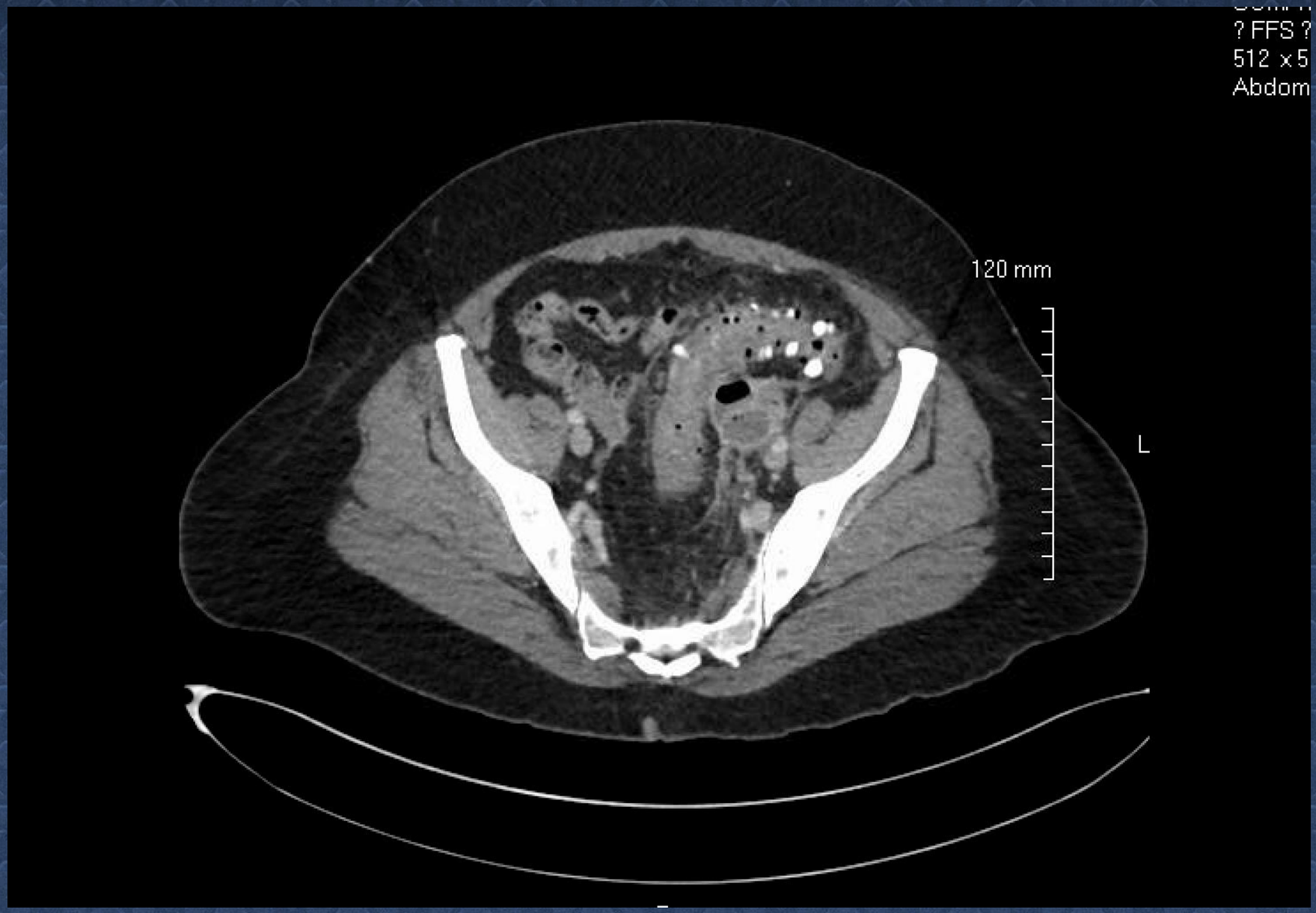
- sigmoid diverticulitis with abscess
- arrow - fat stranding
- circle - multiloculated abscess
- Stage 1b
- Severe CT grade



Complicated Diverticulitis

- Free air
- fat stranding
- wall thickening
- Hinchey Stage 1b or 2
- Severe CT grade





Surgery for Diverticulitis

So just when do we operate?

Controversies

- What type of operation?
  - partial colectomy with colostomy
  - partial colectomy with anastomosis
    - with or without diverting ileostomy
  - laparoscopic/open drainage without resection
- How many recurrences before we operate?
- When can we get by with nonoperative treatment
  - abscesses accessible by percutaneous drainage
  - Hinchey Stage 3?
    - maybe?, in non-toxic patient

Hartmann's Procedure

- Sigmoid resection with end colostomy
- tried and true
- requires 2nd, sometimes difficult, operation to establish continuity
  - up to 40% of patients don't have reversal
- open vs laparoscopic

Primary Anastomosis

- Most trials included diverting ileostomy in Hinchey 3&4 diverticulitis
- Most trials underpowered for definitive answer
- Multiple studies suggesting similar complications to Hartmann's at index operation
- More likely to reverse ileostomy than colostomy
- Fewer complications for 2nd stage operation

Laparoscopic Lavage

- DILALA trial (Sweden/Denmark) -safe v Hartmann's (<80 pts)
- LOLA trial (Netherlands) - terminated early at 90 pts due to complications in lavage group
- SCANDIV trial (Sweden/Denmark) - no benefit to lavage group (197 pts)
- may have role in drainage of abscesses not amenable to percutaneous drainage

Acta Chir Belg. 2011 Nov-Dec;111(6):378-83.

Complicated sigmoid diverticulitis--Hartmann's procedure or primary anastomosis?

Herzog T1, Janot M, Belyaev O, Sülberg D, Chromik AM, Bergmann U, Mueller CA, Uhl W.

Primary Anastomosis Versus Hartmann's Procedure for Perforated Diverticulitis With Peritonitis: An Impracticable Trial

Binda, Gian Andrea MD; Serventi, Alberto MD; Puntoni, Matteo; Amato, Antonio MD

Ann Surg. 2012 Nov;256(5):819-26; discussion 826-7. doi: 10.1097/SLA.0b013e31827324ba.

A multicenter randomized clinical trial of primary anastomosis or Hartmann's procedure for perforated left colonic diverticulitis with purulent or fecal peritonitis.

Oberkofler CE1, Rickenbacher A, Raptis DA, Lehmann K, Villiger P, Buchli C, Grieder F, Gelpke H, Decurtins M, Tempia-Caliera AA, Demartines N, Hahnloser D, Clavien PA, Breitenstein S.

What is the Preferred Surgery for Perforated Left-Sided Diverticulitis?

Elijah Dixon, MD, W. Donald Buie, MD, Charles P. Heise, MD for Members of the Evidence Based Reviews in Surgery Group

Biomed Res Int. 2014;2014:380607. doi: 10.1155/2014/380607. Epub 2014 Jun 3.

The best choice of treatment for acute colonic diverticulitis with purulent peritonitis is uncertain.

Hupfeld L1, Burcharth J1, Pommergaard HC1, Rosenberg J1.

Laparoscopic peritoneal lavage or sigmoidectomy for **perforated diverticulitis** with purulent peritonitis: a multicentre, parallel-group, randomised, open-label trial.

Vennix S, Musters GD, Mulder IM, Swank HA, Consten EC, Belgers EH, van Geloven AA, Gerhards MF, Govaert MJ, van Grevenstein WM, Hoofwijk AG, Kruyt PM, Nienhuijs SW, Boermeester MA, Vermeulen J, van Dieren S, Lange JF, Bemelman WA; Ladies trial colloborators.

Lancet. 2015 Sep 26;386(10000):1269-77. doi: 10.1016/S0140-6736(15)61168-0. Epub 2015 Jul 22.

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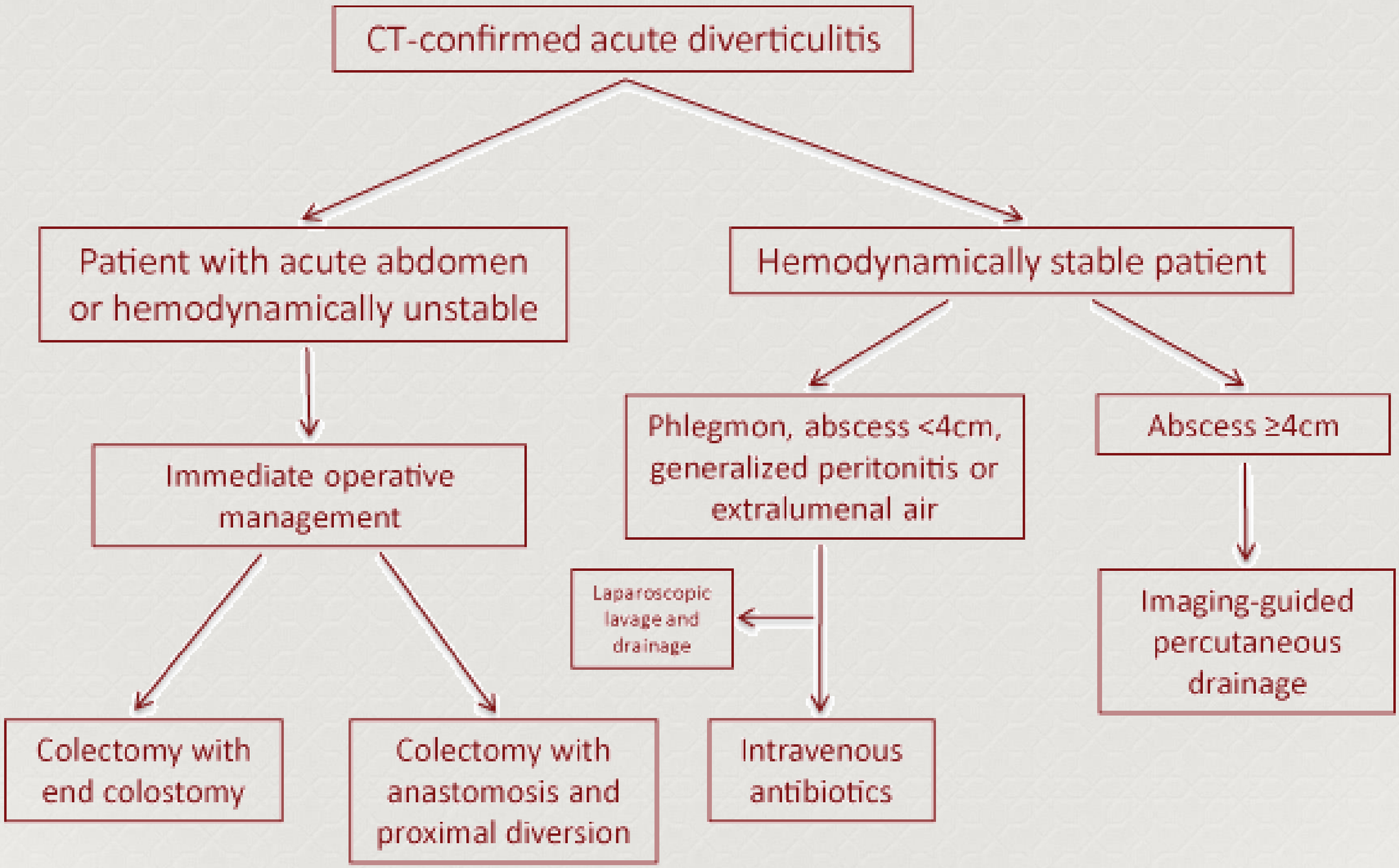
Acute laparoscopic and open sigmoidectomy for perforated diverticulitis: a propensity score-matched cohort.

Vennix S1,2, Lips DJ3, Di Saverio S4, van Wagensveld BA5, Brokelman WJ3, Gerhards MF6, van Geloven AA7, van Dieren S8, Lange JF9, Bemelman WA10.


CT-confirmed acute diverticulitis
Patient with acute abdomen or hemodynamically unstable
Hemodynamically stable patient
Immediate operative management
Phlegmon, abscess <4cm, generalized peritonitis or extralumenal air
Abscess ≥4cm
Laparoscopic lavage and drainage
Imaging-guided percutaneous drainage
Colectomy with end colostomy
Colectomy with anastomosis and proximal diversion
Intravenous antibiotics

Patient has complicated diverticulitis

Disease has progressed to obstruction, abscess or fistula formation, free perforation, or significant bleeding

Obstruction (signaled by marked abdominal distention)

Perform diagnostic imaging.

Small bowel obstruction

High-grade: treat surgically.
Low-grade: treat medically; consider surgical treatment if indicated.

Large bowel obstruction

Cecal distention present: treat surgically.
Cecal distention absent: treat medically; consider surgical treatment if indicated.

Abscess (signaled by localized peritonitis and fever)

Perform diagnostic imaging.

Small abscess

Perform elective one-stage resection.

Large abscess

Attempt percutaneous drainage.

Drainage succeeds

Perform elective one-stage resection.

Drainage fails

Initiate early surgical treatment.

Fistula (signaled by fecaluria and pneumaturia)

Perform diagnostic imaging; look for bladder air.
Treat medically.
Resect colon and fistula in one-stage procedure.

Free perforation (signaled by generalized peritonitis and rigid abdomen)

Initiate urgent surgical treatment.
Consider performing diagnostic imaging; look for free air.

Hinchey stage III

Perform resection with anastomosis; alternatively, perform Hartmann procedure.

Hinchey stage IV

Perform Hartmann procedure.

Bleeding (lower GI)

Massive bleeding

Administer transfusions.
Perform angiography.

Moderate bleeding

Observe patient.
Perform colonoscopy.

Angiogram is positive

Perform superselective embolization.

Angiogram is negative

Observe patient.
Consider RBC scanning.

Embolization succeeds

Observe patient.

Embolization fails

Treat surgically.