DIVERTICULAR DISEASE

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Diverticular Disease

Colonoscopy

Abdpelvic CT Scan

Surgical Indications

- Overall, approximately 20% of patients with diverticulitis require surgical treatment.[2,30]
- The most common indication for elective resection is recurrent attacks
  - A task force of the American Society of Colon and Rectal Surgeons recommended sigmoid resection after two attacks of diverticulitis.[31]
  - A cost analysis using a Markov model suggested that cost savings can be achieved if resection is done after three attacks.[32]

ACS Surgery, 2007 Edition

Surgical Indications

- The exact indications for surgery in uncomplicated diverticular disease remain under discussion, but the trend does favor nonoperative therapy and individualizing surgery for a particular indication.
- Recently, several studies have indicated that medical therapy can be continued beyond two attacks without an increase risk of perforation or need for colostomy

Current Surgical Therapy, 10th Edition

Surgical Options

- As a general rule, resection and immediate anastomosis are suitable for Hinchey stage I and perhaps stage II diverticular perforations, whereas resection with diversion (the Hartmann procedure) is the gold standard for stage III and especially stage IV
- Elective resection is done via either the open route or, increasingly, the laparoscopic route
  - Newer approaches (e.g., hand-assisted techniques) have markedly reduced the learning curve and shortened the operating time
  - Consequently, minimal access surgery is rapidly becoming the approach of choice in the management of uncomplicated diverticular disease

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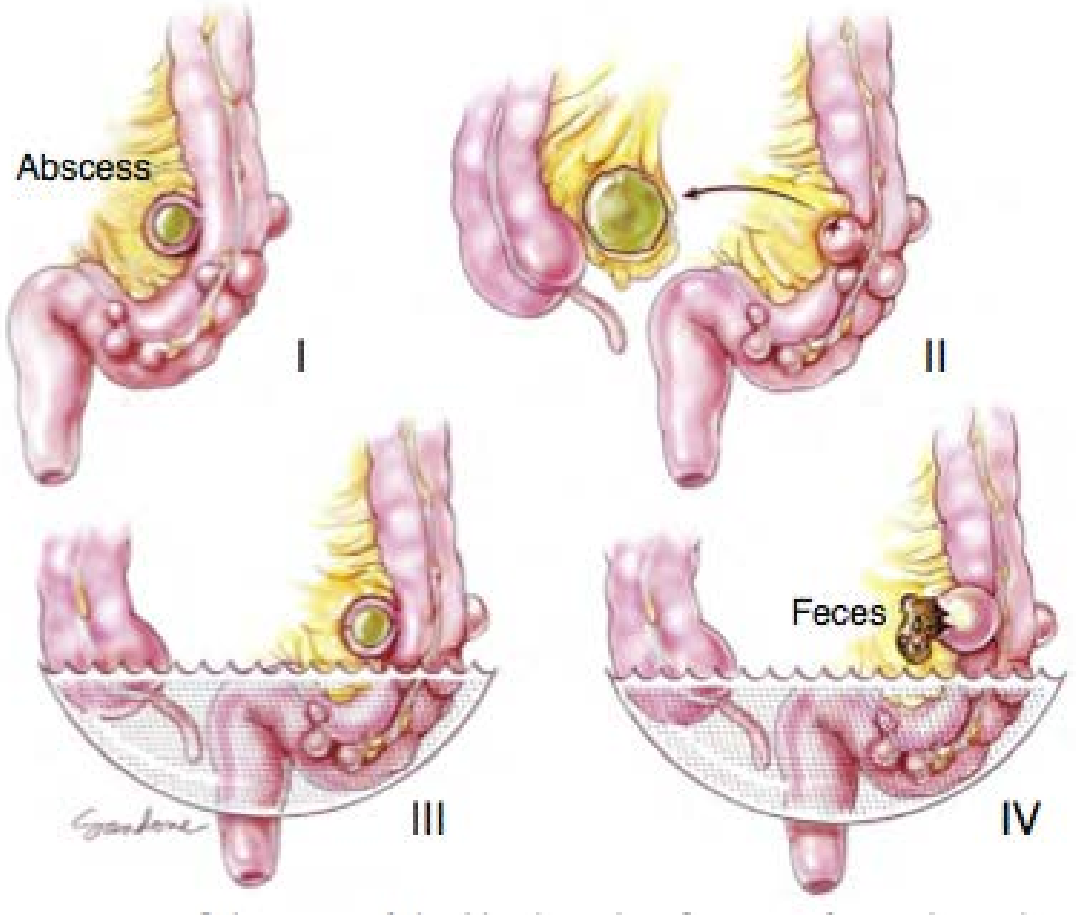
Hinchey Classification



Why Laparoscopy?

- Patients undergoing laparoscopic colectomy have been shown to resume a diet quicker, to need less narcotic analgesia, to have a quicker return of bowel function and a shorter hospital stay.

Surgical Pitfalls; Prevention and Management, Ch 24
-Edward C. Lee, MD and Kelly Garrett, MD

Predictors of Poor Outcome

- One of the unfortunate limitations of the Hinchey classification is that it does not take comorbidities into account
- The American Society of Anesthesiologists (ASA) physical status score and the degree of preoperative organ failure may be significant predictors of outcome.
- Unfavorable systemic factors (below) and the severity of the peritonitis play a vital role in determining patient outcomes
  - hypotension
  - renal failure
  - diabetes
  - malnutrition
  - immune compromise
  - ascites

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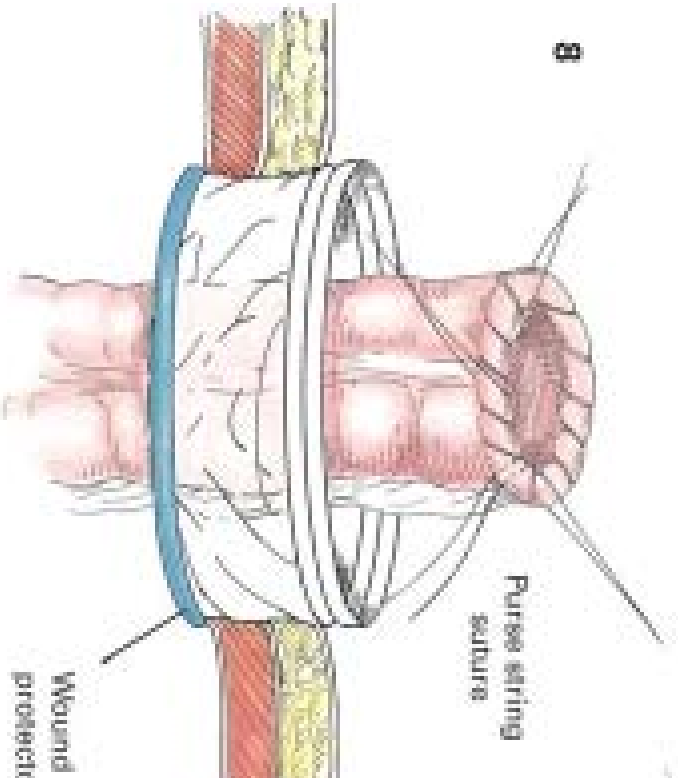
Anastomosis? Diversion?

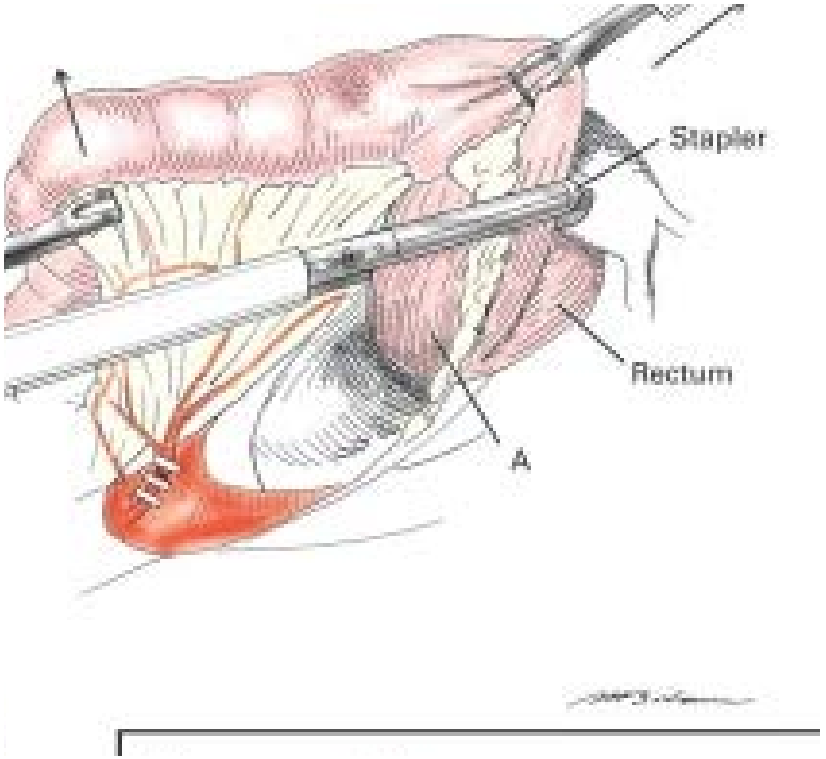
- Grading of comorbidities with classification systems such as APACHE II or the Mannheim peritonitis index can facilitate decision-making with respect to the question of anastomosis versus diversion.[52]

Procedure

Sigmoid Plane of Resection

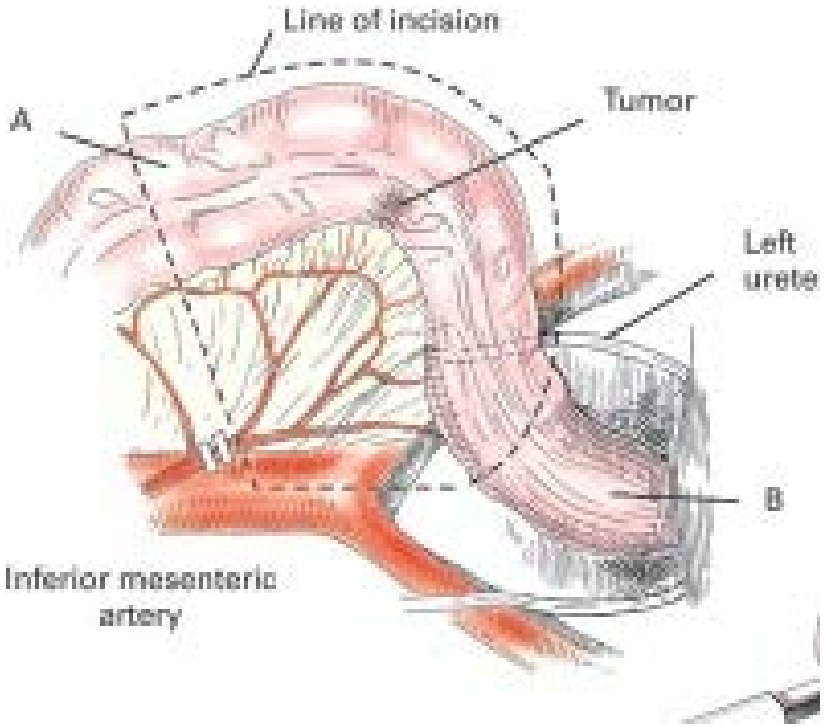


EndoGIA

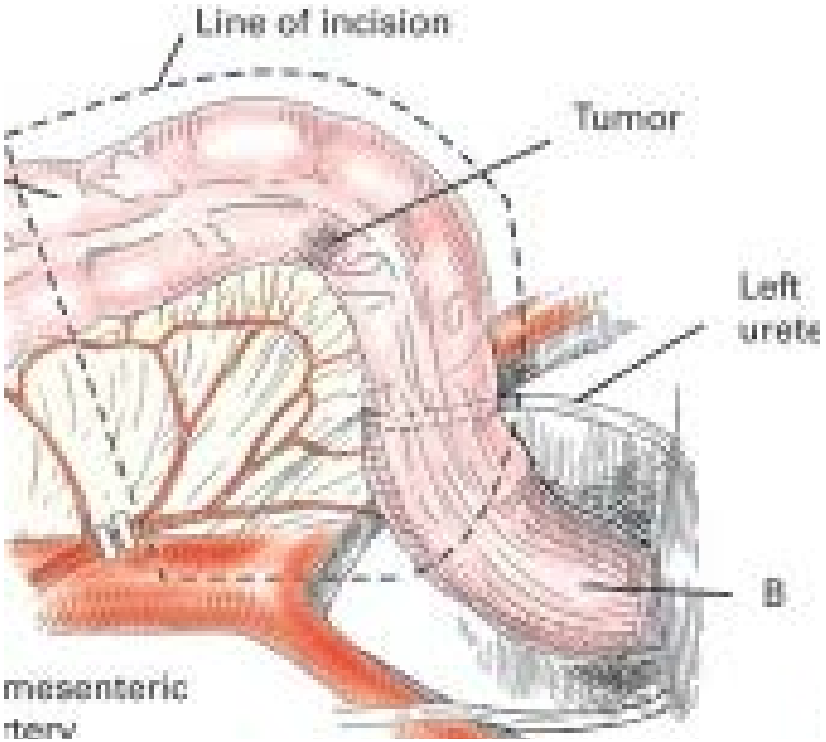


Procedure

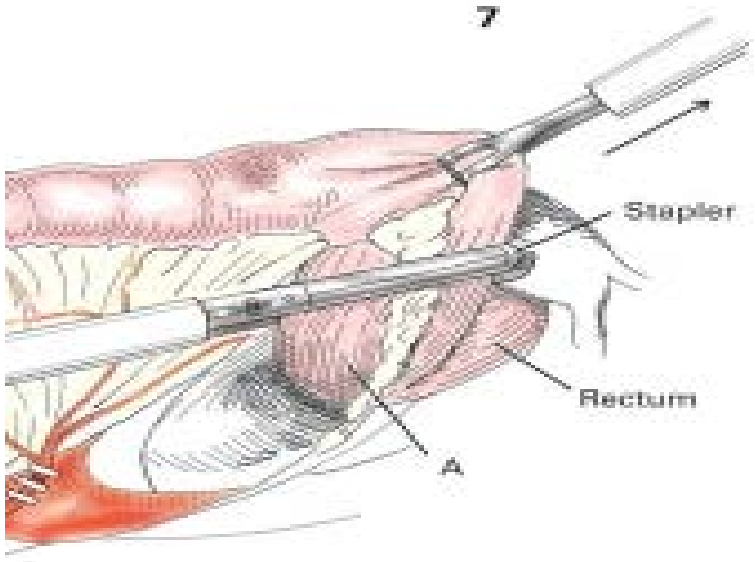
Purse String



EEA Anvil Placement



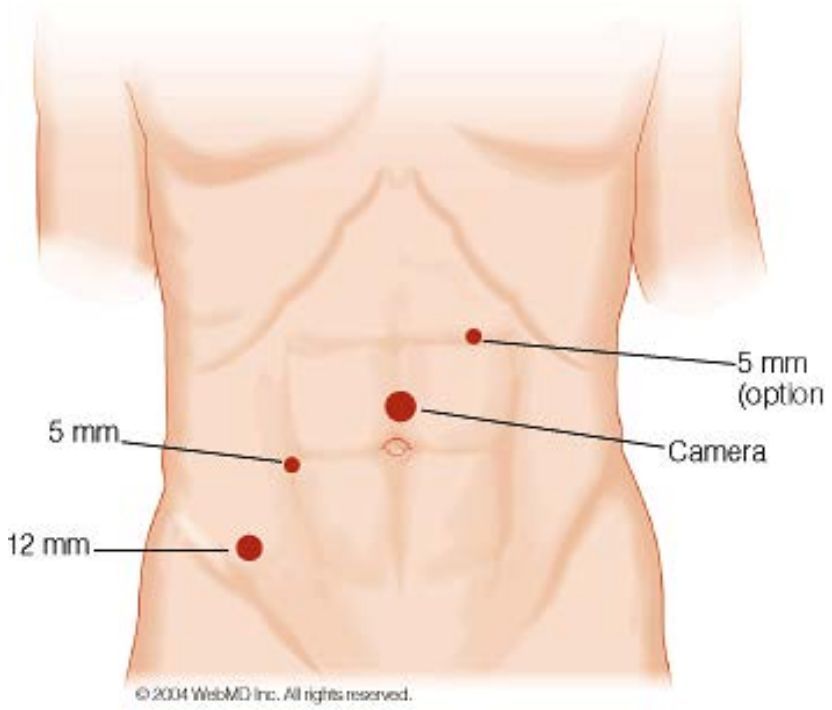
Procedure



HAND-ASSISTED LAPAROSCOPIC RESECTION (Step 1)

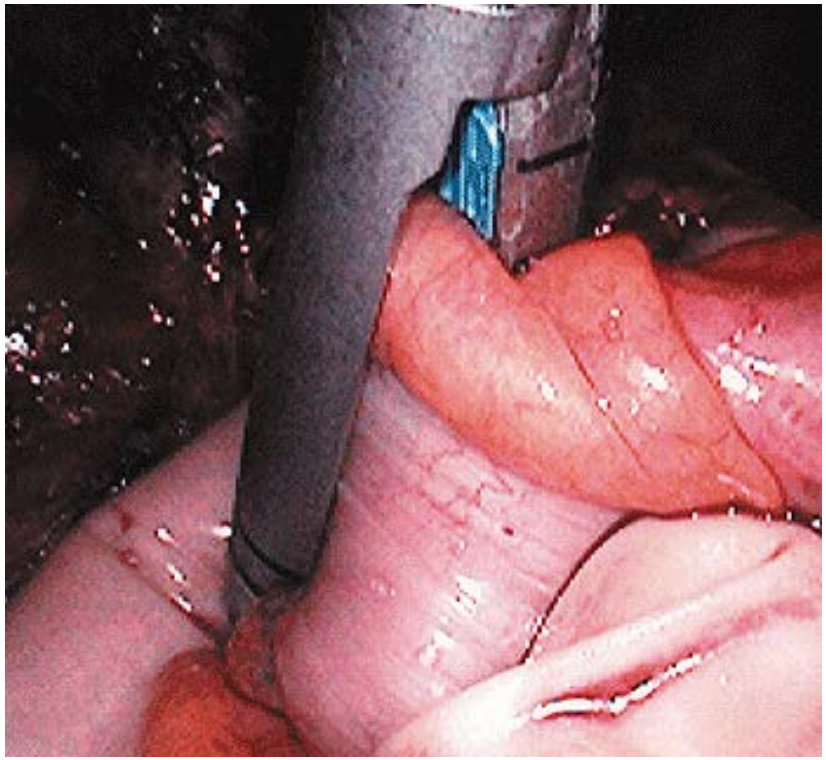
Gel port

Trocar Placement

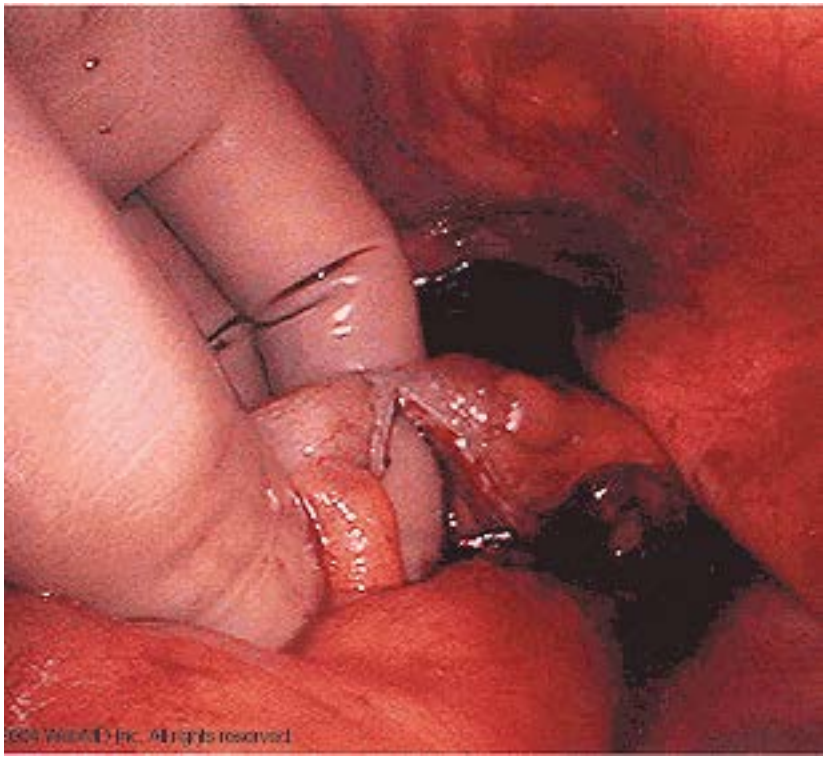


HAND-ASSISTED LAPAROSCOPIC RESECTION (Step 2)

Endoscopic GIA Stapler



Division of the rectum

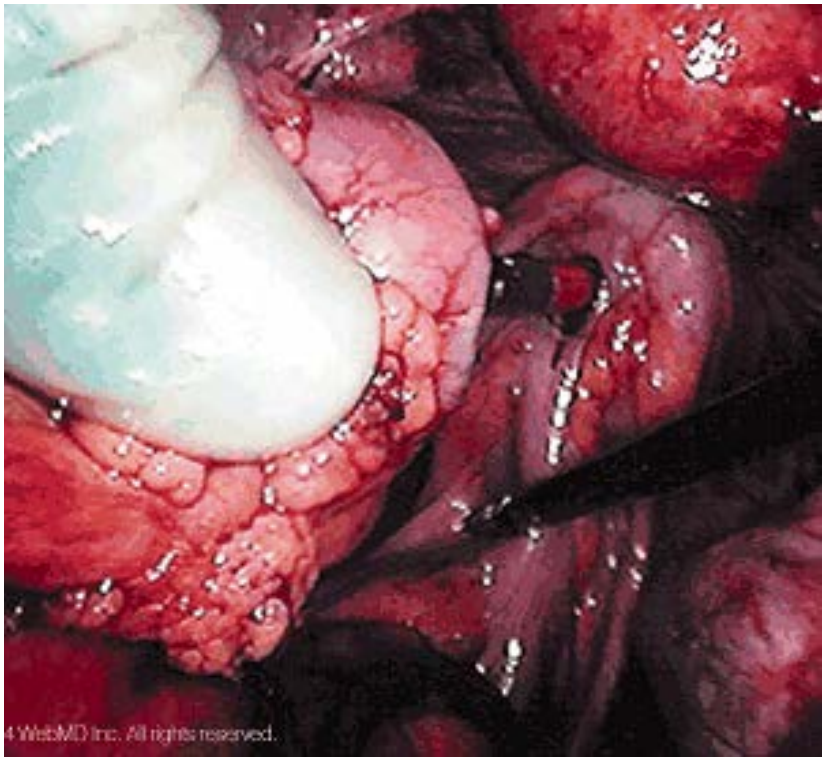


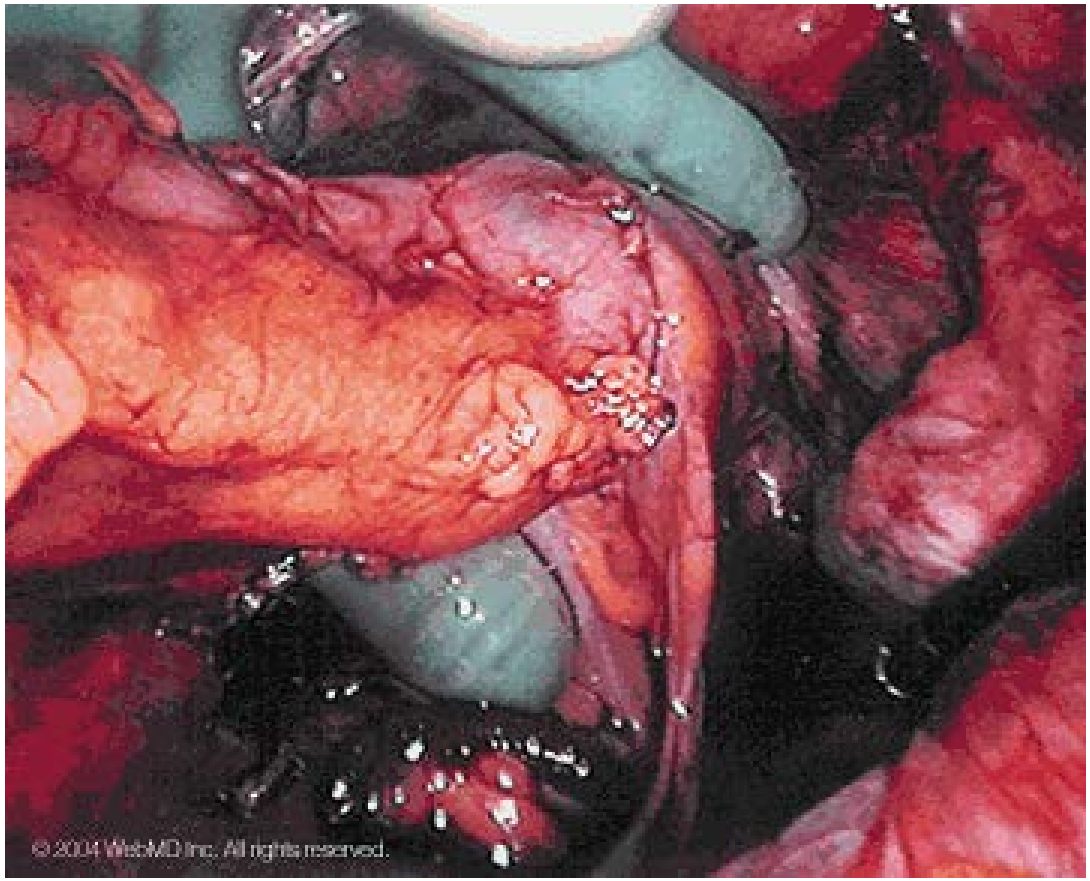
HAND-ASSISTED LAPAROSCOPIC RESECTION (Step 3-4)

Exteriorization of Sigmoid Colon

- Once the colon is mobilized and the blood supply divided, it is time to exteriorize the bowel through the gel port and use a purse string device to divide the proximal colon

Creation of Colorectal Anastomosis

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Complications (Colon surgery)

- Potential complications include
  - ureteral injuries
  - anastomotic leakage
  - anastomotic stricture
  - postoperative intra-abdominal abscesses
  - perioperative bleeding involving the mesentery adhesions, the splenic capsule, or the presacral venous plexus
  - postoperative small bowel obstruction
  - stomal complications
  - wound infection
  - wound dehiscence
  - abdominal compartment syndrome
  - acute respiratory distress syndrome (ARDS)
  - multiple organ dysfunction syndrome (MODS).

Anastomotic leakage

- Incidence
  - 2.7%
    - 33 out of 1223 patients undergoing resection and anastomosis (Ann Surg. 2007 February; 245(2): 254–258)
  - 2.4%
    - 40 out of 1639 of anastomoses (Colorectal Dis. 2007 Jan;9(1):71-9)
  - 10.5%
    - 13 out of 124 of anastomoses (Chir Ital. 2009 Jul-Aug;61(4):407-17)
  - 3.8%
    - (International Journal of Colorectal Disease, Volume 23, Number 3 (2008), 265-270

Anastomotic Leakage

- Anastomotic leaks generally become apparent between postoperative days 4 and 12
- Leaks may manifest as:
  - generalized peritonitis
  - subclinically as a localized collection found on CT
  - signs and symptoms
    - leukocytosis
    - slow return of bowel function (failure to thrive)
    - diarrhea
    - increasing drain output
    - oliguria
    - fevers
    - renal failure

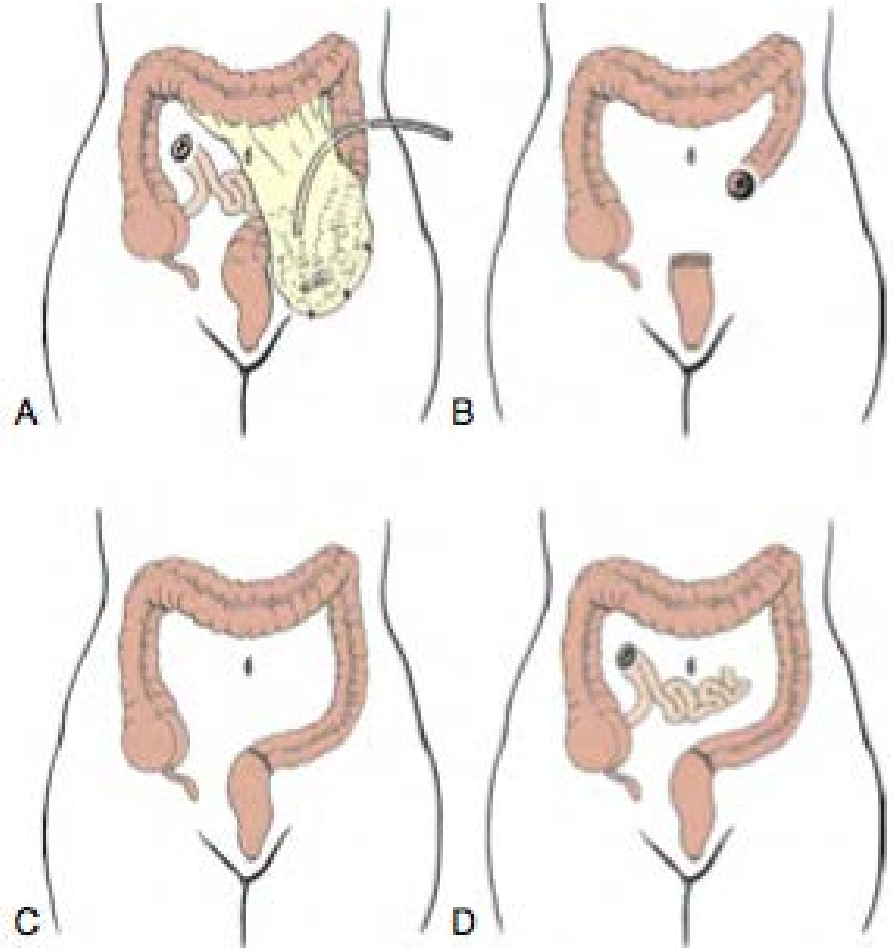
Anastomotic Leakage

- Many factors contribute to the maintenance of anastomotic integrity:
  - surgeon's technical ability
    - using healthy, non-inflamed tissue
    - ensuring an adequate blood supply (intraoperative Doppler)
    - avoiding tension on the anastomosis (performing adequate mobilization of splenic flexure)
    - preserving the superior rectal vessels****
  - patient's comorbidities
  - the setting in which the operation is carried out
    - Emergency vs. Elective Procedure
      - Patients undergoing emergency procedures are at four times higher risk for anastomotic leakage than those undergoing elective procedures

Management of Leak

- Admission, hydration, bowel rest, broad spectrum antibiotics and NGT placement.
- Invasive procedure of choice depends on clinical status of patient
  - drainage procedure by interventional radiology
  - second operation necessitating reinforcement of sutures, omental patch, drainage and/or creation of a temporary diverting stoma

Surgical Management



Journals

Title: Incidence, consequences, and risk factors for anastomotic dehiscence after colorectal surgery: a prospective monocentric study

Journal: Int J Colorectal Dis. 2008 mar; 23(3): 265-70. Epub 2007 Nov 22

Authors: Buchs NC, Gervaz P, Secic M, Bucher P, Mugnier-Konrad B, Morel P

Objective: To assess the incidence, to observe the consequences, and to identify the risk factors associated with anastomotic leakage after colorectal surgery

Type of Study and Time Frame: Prospective; November 2002-February 2006 (single institution)

N: 811 anastomoses

Findings: The following parameters were associated with an increased risk for anastomotic dehiscence:

(1) ASA score >or = 3 ($p = 0.004$)

(2) prolonged (>3 h) operative time ($p = 0.02$)

(3) rectal location of the disease ($p < 0.001$)

(4) and a body mass index > 25 ($p = 0.04$)

Journals

Title: Elective laparoscopic versus open colectomy for diverticulosis: an analysis of ACS-NSQIP database

Authors: Kakarla VR, Nurkin SJ, Sharma S, Ruiz DE, Tiszenkel H

Journal: Surg Endosc. 2012 Jan 19

Objectives: To determine the association between the surgical approach (LC vs. OC) and risk-adjusted overall mortality, overall morbidity, serious morbidity, and wound complications

Methods: Using the American College of Surgeons-National Surgical Quality Improvement Project (ACS-NSQIP) participant-user file, patients were identified who underwent elective colon resection for symptomatic colonic diverticulosis, between 2005 and 2008

N: 7,629 patients divided into two groups: OC (3,870 (50.7%)) and LC (3,759 (49.3%))

Findings:

- The patients treated with LC were significantly less likely to:
  - experience overall morbidity (11.9% vs. 23.2%)
  - serious morbidity (4.6% vs. 10.9%)
  - wound complications (9.1% vs. 17.5%)
  - but not mortality (0.3% vs. 0.8%).
- Operative duration was significantly longer with LC (176.64 vs. 166.70 min, $P < 0.0001$), but the length of stay was significantly shorter (4.77 vs. 7.68 days, $P < 0.0001$)

Conclusion: In the elective setting for symptomatic diverticulosis, LC seems to be associated with lower 30-day morbidity and complication rates compared with OC

Journals

Title: Hand-assisted laparoscopic colectomy (HALC)

Journal: Harefuah. 2011 Jul; 1 50(7): 568-71, 618

Authors: Spector R, Bard S, Wasserberg N

Goals: To report our experience in hand-assisted colorectal resections

Type of Study and Time Frame: prospective; in their institution from 2007-09

N: 100 hand assisted surgeries

Hospital: Department of General Surgery B, Rabin Medical Center, Beilinson Hospital, Petah Tikva, Israel

Findings: Postoperative complications were observed in 19% of patients:

-anastomotic leak (2)

-ileus (2)

-pulmonary emboli (1)

-urinary retention (3)

-urinary tract infection (3)

-wound infection (7)

-spontaneous pneumothorax (1)

Condlusions: HALC is a safe and effective procedure that enables the preservation of the laparoscopy advantages, in a short operative time, and a rapid learning curve

Journals

Title: Does sacrifice of the inferior mesenteric artery or superior rectal artery affect anastomotic leak following sigmoidectomy for diverticulitis? a retrospective review

Authors: Lehmann RK, Brounts LR, Johnson EK, Rizzo JA, Steele SR

Journal: Am J Surg. 2011 May; 201(5): 623-7

Objective: To evaluate whether preservation of the inferior mesenteric artery (IMA) or superior rectal artery (SRA) was associated with a decreased anastomotic leak rate

Type of study and time frame: retrospective review of adult patients undergoing sigmoidectomies from 2 military tertiary care centers

N: 130 patients

Conclusions: IMA or SRA preservation or sacrifice was not associated with an increased leak rate from colorectal anastomoses after sigmoidectomy for diverticular disease. Stapled anastomoses were associated with a lower leak rate than hand-sewn anastomoses

References

- Journals
  - Harefuah. 2011 Jul;150(7):568-71, 618
  - Int J Colorectal Dis 2008 mar; 23(3): 265-70
  - Surg Endosc. 2012 Jan 19
  - Scand J Surg. 2010;99(1):14-7
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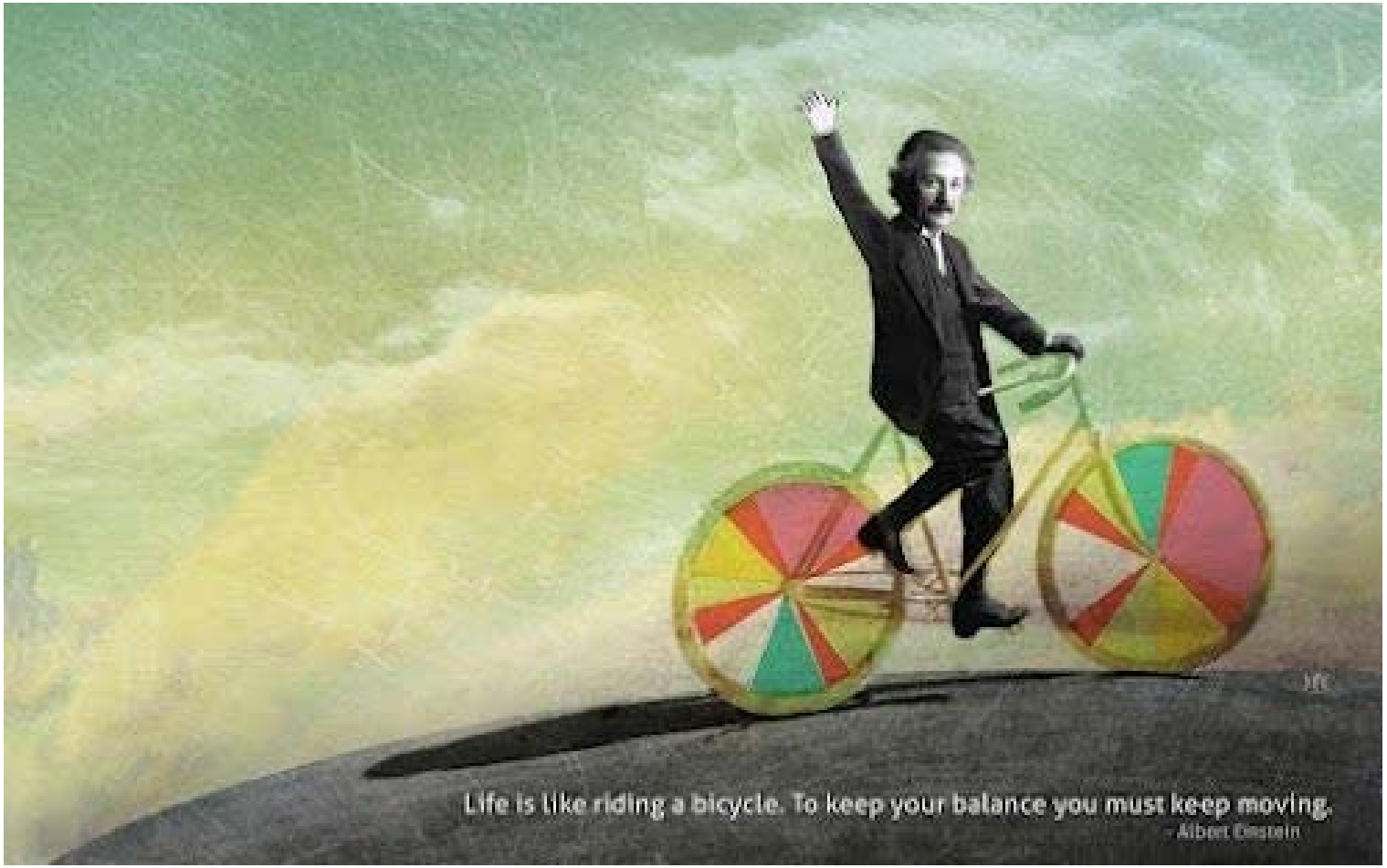
Questions?


Life is like riding a bicycle. To keep your balance you must keep moving.
- Albert Einstein