Diverticulitis: Clinical Understanding, Diagnosis, and Management

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Overview and Epidemiology of Diverticulitis

- **Diverticulitis Definition and Cause**
  - **Diverticulitis involves inflammation or infection of small pouches in the colon caused by structural weakness and pressure.**
- **Epidemiology and Risk Factors**
  - **Higher prevalence in Western countries is linked to low-fiber diets, aging populations, obesity, and lifestyle factors.**
- **Demographic Variations**
  - **Incidence is rising in younger adults**
- **Clinical and Management Impact**
  - **Significant health burden with millions of visits; evolving treatment moves away from routine antibiotics for uncomplicated cases.**

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Pathophysiology and Mechanisms Underlying Diverticulitis

- **Diverticula Formation**
  - **Diverticula form at weak points in the colon wall, often due to increased pressure from low-fiber diets.**
- **Inflammation Mechanisms**
  - **Microperforation triggers bacterial invasion, cytokine release, and neutrophil recruitment causing inflammation.**
- **Risk Factors**
  - **Low fiber diet, obesity, immune dysregulation, and genetic predisposition increase diverticulitis risk.**
- **Complicated Diverticulitis**
  - **Abscess, perforation, fistula, obstruction and may require surgical treatment.**
- **Chronic Refractory Diverticulitis**
  - **Chronic pain/inflammation - may also require surgery**

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Prevention, Long-Term Care, and Lifestyle Measures

- **High-Fiber Diet Benefits**
  - **A diet high in fiber reduces diverticulitis recurrence by increasing stool bulk and lowering colon pressure.**
- **Lifestyle Modifications**
  - **Maintaining healthy weight, regular exercise, and avoiding tobacco lowers the risk of diverticulitis recurrence.**
- **Emerging Prevention Research**
  - **Gut microbiome modulation and anti-inflammatory diets may offer future benefits in diverticulitis prevention.**

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Clinical Presentation and Symptomatology

- **Typical Clinical Symptoms**
  - **Left lower quadrant pain with fever, chills, nausea, and constipation is common in Western populations.**
- **Atypical Presentations**
  - **Right-sided diverticulitis may mimic appendicitis and is more common in Asian populations and younger patients.**
- **Complications and Signs**
  - **Signs like guarding, rebound tenderness, urinary symptoms, and fistula indicate suggestive of complicated diverticulitis.**
- **Diagnostic Importance**
  - **Detailed history and symptom differentiation aid timely diagnosis and appropriate management.**

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Diagnostic Workup and Imaging Approaches

- **Role of CT Scanning**
  - **Contrast-enhanced CT scans are the gold standard for diagnosing diverticulitis by showing inflammation and complications.**
- **Supporting Laboratory Tests**
  - **Laboratory evaluations like CBC and CRP assess disease severity and help identify dehydration or electrolyte imbalances.**
- **Alternative Imaging Options**
  - **Ultrasound and MRI serve as alternatives for patients who cannot undergo CT due to radiation concerns or pregnancy.**
- **Colonoscopy Timing**
  - **Colonoscopy is contraindicated during acute diverticulitis but recommended 6-8 weeks later to exclude malignancy and assess disease if not recently done.**

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DIVERTICULITIS, COLONOSCOPY AND RISK OF COLON CANCER

- Meta-analysis of 31 studies and 50,445 patients, the pooled prevalence of colon cancer was 1.9% among patients with diverticulitis.[12]
- Risk of colon cancer higher in complicated diverticulitis (7.9%) compared to uncomplicated diverticulitis (1.3%).
  - Prevalence of advanced adenomas 4.4% and adenomas 14.2% among those who underwent lower endoscopy.
- Randomized trial comparing observation with antibiotic treatment for uncomplicated diverticulitis, 1.2% patients were diagnosed with colon cancer within 3 months of randomization.[6]
  - Colonoscopy advised after episode of complicated diverticulitis and first episode of uncomplicated diverticulitis, unless a recent (within 1 year) high-quality colonoscopy was performed with no findings warranting short-interval follow-up.

Meyer, J. · Orci, L.A. · Combescure, C. ...
Risk of colorectal cancer in patients with acute diverticulitis: a systematic review and meta-analysis of observational studies *Clin Gastroenterol Hepatol.* 2019; **17**:1448-1456.e17

Daniels, L. · Ünlü, Ç. · de Korte, N. ...
Randomized clinical trial of observational versus antibiotic treatment for a first episode of CT-proven uncomplicated acute diverticulitis *Br J Surg.* 2017; **104**:52-61

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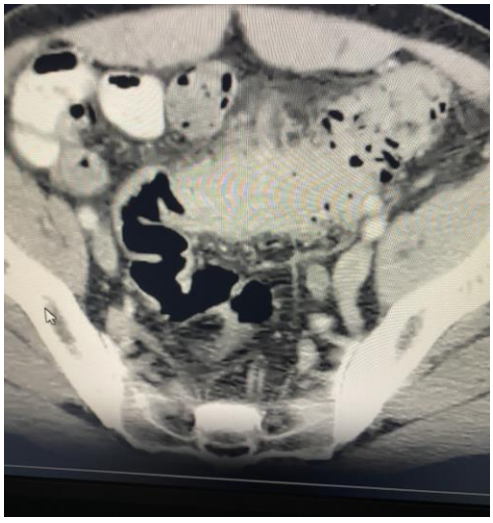
UNCOMPLICATED SIGMOID DIVERTICULITIS CT



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Management of Uncomplicated Diverticulitis

- **Selective Antibiotic Use**
  - **Antibiotics are reserved for patients with systemic infection signs or high-risk features, reducing unnecessary exposure.**
- **Supportive Outpatient Care**
  - **Most patients tolerate outpatient management with hydration, rest, analgesia, and dietary modifications safely.**
- **Patient Education and Prevention**
  - **Education dispels myths about diet; emphasizes high-fiber diet after acute episodes resolves, exercise, and weight management for prevention.**
- **Antibiotic Therapy is broad spectrum aerobic and anaerobic coverage such as amoxicillin-clavulanate or levofloxacin and metronidazole.**

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AVOD AND DIABOLO TRIALS

- RCTs published short-term results of omitting antibiotics compared to routine antibiotic treatment.
  - Both showed no significant differences regarding recovery from the initial episode, as well as rates of complicated or recurrent diverticulitis and sigmoid resection. However, **both studies showed a trend of higher rates of sigmoid resection in the observational groups.**
- **DIABOLO:** 528 patients with CT-proven, primary, left-sided, uncomplicated acute diverticulitis randomized to either an observational or an antibiotic treatment strategy. Outcome measures were complicated diverticulitis, recurrent diverticulitis and sigmoid resection at 24 months' follow up.
- **Results:** No difference in rates of recurrent diverticulitis (15.4% in the observational group versus 14.9% in the antibiotic group; p = 0.885), complicated diverticulitis (4.8% versus 3.3%; p = 0.403) and sigmoid resection (9.0% versus. 5.0%; p = 0.085). **Young patients (<50 years) and patients with a pain score at presentation of 8 or higher on a visual analogue pain scale were at risk for complicated or recurrent diverticulitis.**
  - Treatment type (with or without antibiotics) was not an independent predictor for complicated or recurrent diverticulitis.
- **Conclusion:** Omitting antibiotics in the treatment of uncomplicated acute diverticulitis did not result in more complicated diverticulitis, recurrent diverticulitis or sigmoid resections at long-term follow up. As the **DIABOLO trial was not powered for these secondary outcome measures, some uncertainty remains whether (small) non-significant differences could be true associations.**

Long-Term Effects of Omitting Antibiotics in Uncomplicated Acute Diverticulitis
S T van Dijk[1], L Daniels[1,1], C Ünlü[1], N de Korte[1], S van Dieren[1], H B Stockmann[1], B C Vrouenraets[1], E C Consten[1], J A van der Hoeven[1], Q A Eijsbouts[1], I F Faneyte[1], W A Bemelman[1], M G Dijkgraaf[1], M A Boermeester[1]; Dutch Diverticular Disease (3D) Collaborative Study Group 2018 Jul;113(7):1045-1052.

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Complications and Broader Clinical Implications

- **Serious Complications**
  - **Diverticulitis can cause abscesses, perforations, and fistulas, each requiring specific medical or surgical treatment.**
- **Symptoms and Impact**
  - **Symptoms like pneumaturia and recurrent infections indicate fistulas, while chronic inflammation affects quality of life.**
- **Healthcare Implications**
  - **Complicated diverticulitis increases hospital stays, healthcare costs, and morbidity, especially in vulnerable patients.**
- **Preventive and Therapeutic Strategies**
  - **Understanding lifestyle and microbial factors aids in prevention and guides therapeutic interventions in diverticulitis.**

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Management of Complicated Diverticulitis

- **Abscess Management**
  - **Small abscesses under 3 cm may be treated with antibiotics, while larger abscesses often require image-guided percutaneous drainage.**
- **Perforation and Surgical Intervention**
  - **Perforation with diffuse peritonitis is a surgical emergency needing urgent operation such as primary anastomosis with protecting stoma or Hartmann's procedure.**
- **Fistula Repair**
  - **Chronic inflammation may cause fistulas requiring elective surgical repair after infection control to restore normal function.**
- **Obstruction and Supportive Care**
  - **Obstruction caused by strictures necessitates surgical resection; supportive care includes antibiotics, fluid, and electrolyte management.**

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HINCHEY CLASSIFICATION & TREATMENT

- **Hinchey I – Pericolic abscess/phlegmon: antibiotics ± drainage.**
- **Hinchey II – Pelvic/retroperitoneal abscess: percutaneous drainage + antibiotics.**
- **Hinchey III – Purulent peritonitis: operative management; no lavage; sigmoid resection.**
- **Hinchey IV – Fecal peritonitis: urgent surgery (Hartmann's or primary anastomosis).**

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LIVER ABSCESSES

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Right Tubo-ovarian Abscess

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Left Peridiverticular Abscess/Phlegmon

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Localized Perforation / Small Bowel Obstruction

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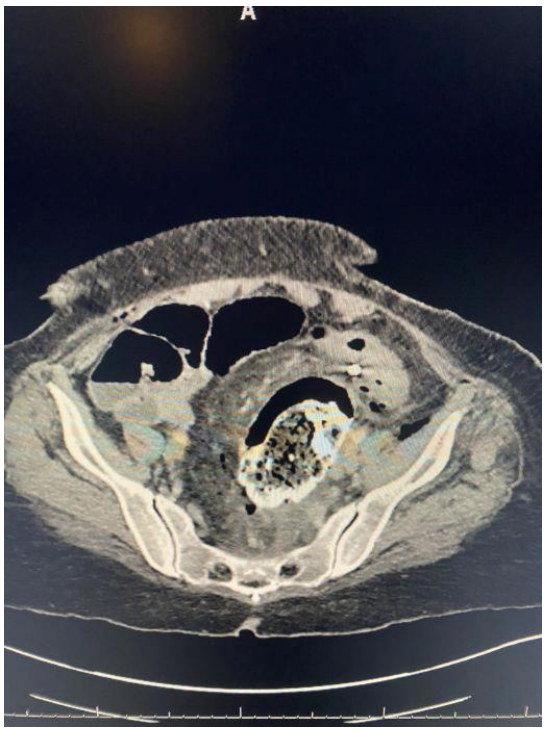

Chronic Pelvic Perforation / Fecal Peritonitis

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SURGICAL INDICATIONS AND OPERATIVE STRATEGIES

- **Surgical Indications and Operative Strategies**
- **Indications for Surgery**
  - **Surgery is indicated for failed medical therapy, recurrent episodes affecting QoL, and complications like fistulas or perforation.**
- **Elective Surgical Techniques**
  - **Segmental colectomy with primary anastomosis is common, performed laparoscopically, robotic or via open surgery based on inflammation severity.**
- **Emergency Surgery Options**
  - **Emergent cases with perforation may require Hartmann's procedure or primary anastomosis with diversion.**
- **Preoperative and Postoperative Care**
  - **Optimization includes infection control and nutrition; postoperative care focuses on mobilization and complication monitoring.**

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LAPAROSCOPIC LAVAGE EVIDENCE

- **Randomized trials (SCANDIV, LADIES) showed no benefit vs resection for Hinchey III.**
- **Higher rates of reoperation, abscess, and sepsis with lavage.**
- **ASCRS & WSES: Lavage NOT recommended as first-line therapy.**
- **Preferred: sigmoid resection based on stability and contamination.**

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DIVERTICULITIS SUMMARY

- **Most diverticulitis is uncomplicated and managed outpatient.**
- **Selective—not routine—antibiotics for mild uncomplicated cases with caveat that RCTs underpowered for secondary outcomes.**
- **CT imaging guides classification and treatment.**
- **Hinchey staging directs escalation from medical to surgical care.**
- **Complicated cases (abscess, fistula, obstruction, perforation) need intervention.**
- **Laparoscopic lavage not recommended based on SCANDIV & LADIES.**

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Key References

- **ASCRS Clinical Practice Guidelines, 2020.**
- **AGA Clinical Practice Update on Diverticulitis, 2021.**
- **WSES Guidelines for Diverticulitis, 2020.**
- **SCANDIV Trial (JAMA 2015).**
- **LADIES Trial (Lancet 2015).**
- **DINAMO Trial (Ann Surg 2021).**

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