Endoscopic diagnosis of inflammatory bowel disease in adults

AUTHOR: Michael A Roy, MD, FACP
SECTION EDITORS: John R Saltzman, MD, FACP, FACG, FASGE, AGAF, Sunanda V Kane, MD, MSPH
DEPUTY EDITOR: Kristen M Robson, MD, MBA, FACG

All topics are updated as new evidence becomes available and our peer review process is complete.

Literature review current through: **Sep 2023.**
This topic last updated: **Aug 09, 2023.**

INTRODUCTION

Inflammatory bowel disease (IBD) is a chronic relapsing and remitting inflammatory disorder of the gastrointestinal tract, and ulcerative colitis (UC) and Crohn disease (CD) are common phenotypes of IBD. The diagnosis of IBD is based on clinical, laboratory, endoscopic and radiologic findings. Ileocolonoscopy with biopsy has a pivotal role in the diagnostic evaluation of patients with suspected IBD. For patients with established IBD, gastrointestinal endoscopy may be utilized for screening for dysplasia, assessing response to medical therapy, evaluating symptoms of a disease flare, detecting postoperative recurrence, and treating luminal strictures.

This topic will focus on the endoscopic features of IBD and distinguishing UC from CD based on such features. The topic will also discuss endoscopy-related issues that are unique to patients with IBD. The clinical manifestations, diagnosis and management of UC are discussed separately:

- (See "Clinical manifestations, diagnosis, and prognosis of ulcerative colitis in adults".)
- (See "Medical management of low-risk adult patients with mild to moderate ulcerative colitis".)
- (See "Management of moderate to severe ulcerative colitis in adults".)
- (See "Management of the hospitalized adult patient with severe ulcerative colitis".)

The clinical manifestations, diagnosis, and management of CD are discussed separately:

- (See "Clinical manifestations, diagnosis, and prognosis of Crohn disease in adults".)
- (See "Overview of the medical management of mild (low risk) Crohn disease in adults".)
- (See "Medical management of moderate to severe Crohn disease in adults".)

The role of colonoscopy in cancer surveillance for patients with IBD is discussed separately. (See "Surveillance and management of dysplasia in patients with inflammatory bowel disease".)

The diagnosis of IBD in children and adolescents is discussed separately. (See "Clinical presentation and diagnosis of inflammatory bowel disease in children", section on 'Diagnostic evaluation'.)

ILEOCOLONOSCOPY

Patient selection

Indications — Endoscopic evaluation with ileocolonoscopy (ie, colonoscopy with intubation and inspection of the terminal ileum) with mucosal biopsy is indicated for patients with suspected IBD. The goals of endoscopic evaluation are:

- To exclude other causes of colitis
- To establish the diagnosis
- To determine the extent and severity of disease
- To identify complications of IBD (eg, luminal stricture, fistula)

Ileocolonoscopy is also performed for patients with established IBD to monitor disease activity or to evaluate symptoms of a disease flare. Diarrhea (with or without gross bleeding) and abdominal pain are commonly reported symptoms in patients with active IBD, and clinical features of IBD are discussed in more detail separately. (See "Clinical manifestations, diagnosis, and prognosis of Crohn disease in adults" and "Clinical manifestations, diagnosis, and prognosis of ulcerative colitis in adults".)

Contraindications — Contraindications to ileocolonoscopy include:

- Hemodynamic instability
- Suspected or known perforated viscus
- Acute diverticulitis
- Suspected or known toxic megacolon (see "Toxic megacolon")

For patients with suspected severe colitis (ie, evidence of systemic toxicity such as fever, tachycardia), we do not perform a complete colonoscopy but may perform a more limited endoscopic exam of the colon (eg, flexible sigmoidoscopy) without a bowel preparation to assess the severity of mucosal disease. Endoscopic examination to the cecum and terminal ileum is avoided in patients with severe colitis because of the increased risk of colonic dilation and perforation [1]. Management of acute severe colitis is discussed separately. (See "Management of the hospitalized adult patient with severe ulcerative colitis".)

Patient preparation — Most patients with suspected or established IBD can tolerate an oral lavage (ie, oral consumption of liquid solution for colon cleansing) [2]. However, we do not use an oral lavage for bowel preparation in patients with severe colitis and typically perform a limited flexible sigmoidoscopy without bowel preparation when endoscopic evaluation is indicated. (See "Management of the hospitalized adult patient with severe ulcerative colitis", section on 'Pretreatment evaluation'.)

We typically use a polyethylene glycol-based solution for bowel preparation for patients with IBD because they minimize preparation-related mucosal injury. Specific options for bowel preparation including their administration, safety, and efficacy are discussed separately. (See "Bowel preparation before colonoscopy in adults".)

Other aspects of patient preparation for colonoscopy (eg, diet, medication adjustments) are discussed separately. (See "Overview of colonoscopy in adults", section on 'Patient preparation'.)

Differentiating ulcerative colitis from Crohn disease — Differentiating between ulcerative colitis (UC) and Crohn disease (CD) is important because there are implications for prognosis and treatment [3]. In approximately 10 percent of patients with IBD, the distinction between UC and CD cannot be made; such patients are referred to as having indeterminate colitis (also termed unclassified IBD). For patients in whom the IBD phenotype is uncertain, the prognosis may be worse than for those with a confirmed diagnosis of UC (as they may have CD). In addition, there may be an increased risk of perianal complications and pouch failure for patients with indeterminate colitis who require surgery, and this is discussed separately. (See "Surgical management of ulcerative colitis", section on 'Patients with indeterminate colitis'.)

Direct visualization

- Ulcerative colitis – Typical endoscopic features of UC are (table 1) [4]:
    - General mucosal appearance – Mucosal abnormalities include erythema, friability, ulcerations, and granularity. The granular appearance is manifested by changes in light reflection during colonoscopy. Instead of reflecting light in large patches, the granular

mucosa reflects a multitude of small points of light, and this results in an appearance of "wet sandpaper."

- Pseudopolyps – Pseudopolyps result from chronic mucosal hyperplasia due to repeated episodes of inflammation and ulceration that has resolved. Thus, they are more often seen in the setting of mild or no active inflammation. Pseudopolyps (also referred to as filiform polyps) are more common in patients with UC than CD, but they are not specific for either form of IBD (picture 1) [5]. They can range in size from a few millimeters in diameter to a centimeter or more. They tend to be taller than they are wide. Most pseudopolyps can be identified based on endoscopic visualization alone because of their characteristic appearance. However, if the etiology is uncertain, biopsy of the polyp confirms its inflammatory nature based on histology and excludes other polyp types (eg, adenomatous polyp). (See "Overview of colon polyps", section on 'Inflammatory polyps'.)

- Extent – For most treatment-naïve patients with ulcerative colitis, the endoscopic appearance of the colon is usually characterized by continuous, circumferential involvement of the rectal mucosa that extends proximally [3]. The inflammatory changes begin from the point of origin and gradually transition to normal mucosa (picture 2). Involvement of the left side of the colon is more common in UC than in CD.

  Some patients with UC who have been treated with topical mesalamine or glucocorticoids or systemic therapy may have rectal sparing or a patchy distribution of inflammatory changes [6,7]. In addition, some patients have focal inflammation around the appendiceal orifice that is not contiguous with disease elsewhere in the colon (also referred to as a cecal patch) [8].

The severity of the endoscopic appearance of UC has been graded using a variety of scoring systems. The Mayo score for assessing overall UC disease activity is commonly used in clinical trials (calculator 1) [9]. Values for the Mayo score range from zero to 12, with higher scores corresponding with more severe disease. Values for the Mayo endoscopic subscore range from zero (normal mucosa) to 3 (severe colitis with ulcerations and spontaneous bleeding).

- Backwash ileitis – Backwash ileitis refers to inflammation in the terminal ileum in patients with UC. The term "backwash" evolved from a belief that the inflammation arose from exposure of the ileal mucosa to cecal contents, although its pathogenesis is not well understood. In a study including 200 patients with UC in whom CD was

definitively excluded, the prevalence of backwash ileitis based on examination of ileocolonic resection specimens was 17 percent [10].

Studies have suggested that risk factors for backwash ileitis include extensive colitis and primary sclerosing cholangitis, and the severity of ileitis is usually similar to the severity of colitis [10-13]. Biopsies of the terminal ileum can help distinguish backwash ileitis from CD-related ileitis. Granulomas on ileal biopsy support the diagnosis of CD rather than UC. Other diagnostic testing such as small bowel radiologic imaging for evaluating patients with suspected CD is discussed separately. (See "Clinical manifestations, diagnosis, and prognosis of Crohn disease in adults", section on 'Diagnostic evaluation'.)

- Crohn disease – Endoscopic findings that are specific for the diagnosis of CD and help to distinguish it from UC are (table 1) [14]:

  - Ulceration – Aphthous ulcers are small, discrete ulcers that can be seen in mild to moderate CD (picture 3), whereas patients with moderate to severe CD may have deep, transmural ulcers that involve the entire colonic wall [15].

  - Cobblestone appearance – Serpiginous and linear ulcers can course for several centimeters along the longitudinal axis of the colon in CD (picture 4). This type of ulceration results in the typical cobblestone appearance (ie, the deep linear ulcers are the crevices between the stones, while islands of inflamed or normal tissue form the stones).

  - Discontinuous lesions (ie, skip lesions) – The inflammatory pattern of CD is typically discontinuous (ie, spatially intermittent bowel inflammation). Segments of inflammation can be adjacent to normal tissue, resulting in skip lesions or skip areas (picture 5).

  Other endoscopic findings that support the diagnosis but are not specific for CD include the following:

  - Normal-appearing rectal mucosa
  - Inflammation of the terminal ileum in the absence of colonic inflammation
  - Normal vasculature adjacent to inflamed mucosa is often seen in CD, while loss of vascularity and friability is more typical of UC

  Clinical trials including patients with CD often use formal grading systems to describe disease activity based on endoscopic visualization. Two such systems are the CD index of

severity and the simple endoscopic score for CD (SES-CD score) [16,17]. The SES-CD score is based on the following endoscopic findings: ulcer size, extent of ulcerated and inflamed surfaces, and luminal narrowing [16].

- Role of ileoscopy – Visualization and biopsy of the terminal ileum can be routinely accomplished in most patients. Studies suggest that rates of successful ileal intubation during colonoscopy range from 80 to 97 percent [18,19]. Biopsies of the terminal ileum appear to have their greatest value for patients with established or suspected CD or for patients who have abnormal imaging of the terminal ileum [20]. However, some patients with evidence of active small bowel CD on computed tomography with enterography may have normal ileoscopy. This can occur if the distal ileum is not involved, or if the inflammation is confined to the intramural portion of the bowel wall and mesentery [21].

Histologic findings — During ileocolonoscopy for patients with suspected IBD, mucosal biopsies are obtained from at least five sites throughout the colon including the terminal ileum and rectum during the initial endoscopic evaluation, even if the mucosa appears normal using endoscopic visualization [22]. The biopsy specimens are labelled according to the site from which they were taken. We routinely use standard-sized biopsy forceps for mucosal biopsies in this setting.

The goals of histologic examination of the biopsy specimen are to define the phenotype and severity of IBD and to exclude other conditions. Specific histologic features that help differentiate UC from CD include [23]:

- Crypt abscesses – Crypt abscesses are more common in UC than CD.
- Granulomas – Non-caseating granulomas are highly suggestive of CD and have been reported in approximately 5 to 25 percent of biopsy specimens from patients with CD [24].
- Distribution – Histologic findings of CD tend to occur in a discontinuous pattern (ie, spatially intermittent), similar to the pattern of mucosal inflammation on direct endoscopic visualization. (See 'Direct visualization' above.)

Rectal biopsies are useful for differentiating IBD from infectious colitis. Crypt distortion with forked glands, crypt atrophy, and a villiform surface appearance support the diagnosis of IBD and are not usually seen with infectious colitis. A mixed inflammatory infiltrate in the lamina propria is also associated with IBD. Changes in crypt architecture occur early in the course of the disease, being seen as soon as seven days after the onset of symptoms in patients with acute onset IBD [25].

Complications — The risk of serious complications such as bleeding and perforation following colonoscopy with biopsy is low [26]. Data on inflammatory bowel disease as a possible risk factor for perforation are mixed. Most large studies have not identified inflammatory bowel disease as a risk factor for perforation associated with colonoscopy [27-29]. However, in one study including over 80,000 colonoscopies with 50 reported perforations, CD was associated with increased risk of perforation (odds ration [OR] 5.16, 95% 1.79-14.88) [30].

Complications related to colonoscopy and related to procedural sedation are discussed in more detail separately. (See "Overview of colonoscopy in adults", section on 'Adverse events' and "Adverse events related to procedural sedation for gastrointestinal endoscopy in adults".)

OTHER ENDOSCOPIC EXAMINATIONS

Upper endoscopy — Patients with suspected CD do not routinely require upper gastrointestinal endoscopy as part of the diagnostic evaluation unless they have upper gastrointestinal symptoms (eg, dyspepsia, vomiting). Gastroduodenal CD has a reported prevalence ranging from one to 16 percent, and it is usually accompanied by ileal and/or colonic disease [31-35].

Gastroduodenal CD can be diagnosed with esophagogastroduodenoscopy with mucosal biopsies. The endoscopic findings of gastroduodenal CD are similar to those of distal small bowel mucosal disease and include mucosal nodularity and friability. Stellate, linear, or serpiginous ulcers may be seen. Aphthous ulcers also occur. Histologic examination has an important role in confirming the diagnosis, particularly for patients with isolated gastroduodenal disease. (See "Medical management of moderate to severe Crohn disease in adults", section on 'Gastroduodenal disease'.)

Small bowel enteroscopy — Endoscopic evaluation of the small bowel has been historically limited due to its length, intraperitoneal location, and contractility. As an example, push enteroscopy typically only examines the part of the small bowel that is 50 to 150 cm distal to the ligament of Treitz. However, advances in endoscopic technology have facilitated small bowel examination for patients with suspected CD (see "Clinical manifestations, diagnosis, and prognosis of Crohn disease in adults", section on 'Endoscopy'):

- Device-assisted enteroscopy – Device-assisted enteroscopy (eg, balloon-assisted enteroscopy) can provide direct endoscopic visualization throughout the small bowel by using insertion techniques that pleat the small bowel onto an overtube. The instruments can be inserted orally or rectally and complete small bowel visualization can be achieved in some patients, but others have mucosal abnormalities that limit the examination (eg,

stricture, scarring) [36]. In addition, the procedure is invasive and requires deep sedation. Major complications are uncommon but include bleeding and perforation [37]. The indications, techniques, and complications of device-assisted small bowel enteroscopy are discussed in more detail separately. (See "Overview of deep small bowel enteroscopy".)

Video capsule endoscopy — For patients with suspected CD, video capsule endoscopy is a diagnostic tool that provides endoluminal images of the small bowel but is less invasive than conventional optical endoscopy. (See 'Small bowel enteroscopy' above.)

However, patients with known or suspected small bowel strictures require careful preprocedure evaluation because of the risk of capsule retention. A patency capsule is used in patients who are at risk for having small bowel strictures such as those with symptoms of small bowel obstruction or imaging that suggests stricturing. Patient selection, safety, and diagnostic accuracy of video capsule endoscopy is discussed separately. (See "Wireless video capsule endoscopy".)

Endoscopic ultrasound (EUS) — Examination with endoscopic ultrasonography (EUS) can assess bowel wall thickness of the sigmoid colon and rectum and the severity of inflammatory changes to help distinguish transmural from mucosal inflammation (table 1) [38]. EUS is also valuable in the diagnosis of perirectal complications of Crohn disease [39,40]. The use of EUS in the evaluation of suspected perianal Crohn disease is discussed separately. (See "Perianal Crohn disease", section on 'Pretreatment evaluation'.)

SOCIETY GUIDELINE LINKS

Links to society and government-sponsored guidelines from selected countries and regions around the world are provided separately. (See "Society guideline links: Crohn disease in adults" and "Society guideline links: Ulcerative colitis in adults".)

INFORMATION FOR PATIENTS

UpToDate offers two types of patient education materials, "The Basics" and "Beyond the Basics." The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading

level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on "patient info" and the keyword(s) of interest.)

- Basics topics (see "Patient education: Crohn disease in adults (The Basics)" and "Patient education: Ulcerative colitis in adults (The Basics)")
- Beyond the Basics topics (see "Patient education: Crohn disease (Beyond the Basics)" and "Patient education: Ulcerative colitis (Beyond the Basics)")

SUMMARY AND RECOMMENDATIONS

- For patients with suspected inflammatory bowel disease (IBD), endoscopic evaluation with ileocolonoscopy with mucosal biopsy is performed with the following goals (see 'Indications' above):
  - To exclude other causes of colitis
  - To establish the diagnosis
  - To determine the extent and severity of disease
  - To identify complications of IBD (eg, luminal stricture, fistula)
- Most patients with suspected or established IBD can tolerate an oral lavage (ie, oral consumption of a liquid solution for colon cleansing). (See 'Patient preparation' above.)

  However, we do not use an oral lavage for bowel preparation in patients with acute severe colitis and typically perform a limited flexible sigmoidoscopy without bowel preparation when endoscopic evaluation is indicated. (See "Management of the hospitalized adult patient with severe ulcerative colitis", section on 'Pretreatment evaluation'.)
- Differentiating between ulcerative colitis (UC) and Crohn disease (CD) is important because there are implications for prognosis and treatment. In approximately 10 percent of patients with IBD, the distinction between UC and CD cannot be made; such patients are referred to as having indeterminate colitis. (See 'Differentiating ulcerative colitis from Crohn disease' above.)
- For patients with CD undergoing ileocolonoscopy, the typical endoscopic appearance includes aphthous ulcers, edema, and cobblestoning in a discontinuous pattern of

distribution and often with rectal sparing (picture 3 and picture 4 and picture 5).

For patients with UC, the typical endoscopic appearance includes mucosal erythema, friability, ulcerations, and granularity in a continuous, circumferential pattern starting in the rectum and extending proximally (picture 2 and table 1). (See 'Direct visualization' above.)

- Specific histologic features that help differentiate UC from CD include (see 'Histologic findings' above):
  - Crypt abscesses – Crypt abscesses are more common in UC
  - Granulomas – Non-caseating granulomas are highly suggestive of CD
- Patients with suspected CD do not routinely require upper gastrointestinal endoscopy as part of the diagnostic evaluation unless they have upper gastrointestinal symptoms (eg, dyspepsia, vomiting). (See 'Upper endoscopy' above.)

ACKNOWLEDGMENT

The UpToDate editorial staff acknowledges Paul Rutgeerts, MD (deceased), who contributed as a section editor for UpToDate in Gastroenterology.

REFERENCES

1. Makkar R, Bo S. Colonoscopic perforation in inflammatory bowel disease. Gastroenterol Hepatol (N Y) 2013; 9:573.
2. Kumar A, Shenoy V, Buckley MC, et al. Endoscopic Disease Activity and Biologic Therapy Are Independent Predictors of Suboptimal Bowel Preparation in Patients with Inflammatory Bowel Disease Undergoing Colonoscopy. Dig Dis Sci 2022; 67:4851.
3. Bharadwaj S, Narula N, Tandon P, Yaghoobi M. Role of endoscopy in inflammatory bowel disease. Gastroenterol Rep (Oxf) 2018; 6:75.
4. Spiceland CM, Lodhia N. Endoscopy in inflammatory bowel disease: Role in diagnosis, management, and treatment. World J Gastroenterol 2018; 24:4014.
5. Bernstein CN. Neoplasia in inflammatory bowel disease: surveillance and management strategies. Curr Gastroenterol Rep 2006; 8:513.

6. Park SH, Yang SK, Park SK, et al. Atypical distribution of inflammation in newly diagnosed ulcerative colitis is not rare. Can J Gastroenterol Hepatol 2014; 28:125.
7. Joo M, Odze RD. Rectal sparing and skip lesions in ulcerative colitis: a comparative study of endoscopic and histologic findings in patients who underwent proctocolectomy. Am J Surg Pathol 2010; 34:689.
8. Park SH, Loftus EV Jr, Yang SK. Appendiceal skip inflammation and ulcerative colitis. Dig Dis Sci 2014; 59:2050.
9. Schroeder KW, Tremaine WJ, Ilstrup DM. Coated oral 5-aminosalicylic acid therapy for mildly to moderately active ulcerative colitis. A randomized study. N Engl J Med 1987; 317:1625.
10. Haskell H, Andrews CW Jr, Reddy SI, et al. Pathologic features and clinical significance of "backwash" ileitis in ulcerative colitis. Am J Surg Pathol 2005; 29:1472.
11. Heuschen UA, Hinz U, Allemeyer EH, et al. Backwash ileitis is strongly associated with colorectal carcinoma in ulcerative colitis. Gastroenterology 2001; 120:841.
12. Rutter M, Saunders B, Wilkinson K, et al. Severity of inflammation is a risk factor for colorectal neoplasia in ulcerative colitis. Gastroenterology 2004; 126:451.
13. Abdelrazeq AS, Wilson TR, Leitch DL, et al. Ileitis in ulcerative colitis: is it a backwash? Dis Colon Rectum 2005; 48:2038.
14. Pera A, Bellando P, Caldera D, et al. Colonoscopy in inflammatory bowel disease. Diagnostic accuracy and proposal of an endoscopic score. Gastroenterology 1987; 92:181.
15. Waye JD. Endoscopy in inflammatory bowel disease: indications and differential diagnosis. Med Clin North Am 1990; 74:51.
16. Daperno M, D'Haens G, Van Assche G, et al. Development and validation of a new, simplified endoscopic activity score for Crohn's disease: the SES-CD. Gastrointest Endosc 2004; 60:505.
17. Simple endoscopic score (SES – CD) http://www.e-guide.ecco-ibd.eu/resources/calculator/simple-endoscopic-score-ses-cd (Accessed on August 06, 2021).
18. Gaisford WD. Fiberendoscopy of the cecum and terminal ileum. Gastrointest Endosc 1974; 21:13.
19. Nagasako K, Yazawa C, Takemoto T. Biopsy of the terminal ileum. Gastrointest Endosc 1972; 19:7.
20. McHugh JB, Appelman HD, McKenna BJ. The diagnostic value of endoscopic terminal ileum biopsies. Am J Gastroenterol 2007; 102:1084.
21. Samuel S, Bruining DH, Loftus EV Jr, et al. Endoscopic skipping of the distal terminal ileum in Crohn's disease can lead to negative results from ileocolonoscopy. Clin Gastroenterol

Hepatol 2012; 10:1253.

22. Lamb CA, Kennedy NA, Raine T, et al. British Society of Gastroenterology consensus guidelines on the management of inflammatory bowel disease in adults. Gut 2019; 68:s1.
23. Sands BE. From symptom to diagnosis: clinical distinctions among various forms of intestinal inflammation. Gastroenterology 2004; 126:1518.
24. Lee JM, Lee KM. Endoscopic Diagnosis and Differentiation of Inflammatory Bowel Disease. Clin Endosc 2016; 49:370.
25. Surawicz CM, Haggitt RC, Husseman M, McFarland LV. Mucosal biopsy diagnosis of colitis: acute self-limited colitis and idiopathic inflammatory bowel disease. Gastroenterology 1994; 107:755.
26. Kim SY, Kim HS, Park HJ. Adverse events related to colonoscopy: Global trends and future challenges. World J Gastroenterol 2019; 25:190.
27. Blotière PO, Weill A, Ricordeau P, et al. Perforations and haemorrhages after colonoscopy in 2010: a study based on comprehensive French health insurance data (SNIIRAM). Clin Res Hepatol Gastroenterol 2014; 38:112.
28. Bielawska B, Day AG, Lieberman DA, Hookey LC. Risk factors for early colonoscopic perforation include non-gastroenterologist endoscopists: a multivariable analysis. Clin Gastroenterol Hepatol 2014; 12:85.
29. Arora G, Mannalithara A, Singh G, et al. Risk of perforation from a colonoscopy in adults: a large population-based study. Gastrointest Endosc 2009; 69:654.
30. Hamdani U, Naeem R, Haider F, et al. Risk factors for colonoscopic perforation: a population-based study of 80118 cases. World J Gastroenterol 2013; 19:3596.
31. Nugent FW, Roy MA. Duodenal Crohn's disease: an analysis of 89 cases. Am J Gastroenterol 1989; 84:249.
32. Annunziata ML, Caviglia R, Papparella LG, Cicala M. Upper gastrointestinal involvement of Crohn's disease: a prospective study on the role of upper endoscopy in the diagnostic work-up. Dig Dis Sci 2012; 57:1618.
33. Witte AM, Veenendaal RA, Van Hogezand RA, et al. Crohn's disease of the upper gastrointestinal tract: the value of endoscopic examination. Scand J Gastroenterol Suppl 1998; 225:100.
34. Reynolds HL Jr, Stellato TA. Crohn's disease of the foregut. Surg Clin North Am 2001; 81:117.
35. Kefalas CH. Gastroduodenal Crohn's disease. Proc (Bayl Univ Med Cent) 2003; 16:147.
36. Yamamoto H, Kita H. Double-balloon endoscopy. Curr Opin Gastroenterol 2005; 21:573.

37. Xin L, Liao Z, Jiang YP, Li ZS. Indications, detectability, positive findings, total enteroscopy, and complications of diagnostic double-balloon endoscopy: a systematic review of data over the first decade of use. Gastrointest Endosc 2011; 74:563.

38. Ellrichmann M, Wietzke-Braun P, Dhar S, et al. Endoscopic ultrasound of the colon for the differentiation of Crohn's disease and ulcerative colitis in comparison with healthy controls. Aliment Pharmacol Ther 2014; 39:823.

39. Schwartz DA, Wiersema MJ, Dudiak KM, et al. A comparison of endoscopic ultrasound, magnetic resonance imaging, and exam under anesthesia for evaluation of Crohn's perianal fistulas. Gastroenterology 2001; 121:1064.

40. Orsoni P, Barthet M, Portier F, et al. Prospective comparison of endosonography, magnetic resonance imaging and surgical findings in anorectal fistula and abscess complicating Crohn's disease. Br J Surg 1999; 86:360.

Topic 4072 Version 25.0

GRAPHICS

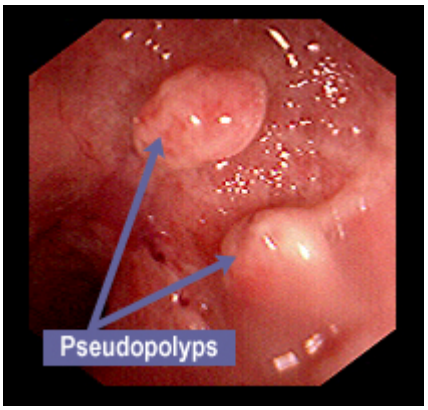
Differentiating ulcerative colitis from Crohn disease

Characteristic	Ulcerative colitis	Crohn disease
Disease distribution	▪ Colon and rectum	▪ Commonly affects terminal ileum ▪ May involve any part of the gastrointestinal tract (ie, mouth to rectum)
Skip lesions (ie, spatially intermittent bowel inflammation)	▪ Rare	▪ Common
Vascularity of the mucosa	▪ Friable mucosa with loss of vascularity	▪ Normal vasculature adjacent to inflamed mucosa
Ulceration	▪ Mainly mucosal ▪ Transmural only in severe colitis	▪ Aphthous ulcers: Small discrete mucosal ulcers ▪ Transmural ulcers: Deeper ulcers that involve the colon wall
Cobblestone appearance	▪ Not seen	▪ Common
Stricture	▪ Rare	▪ Common
Fistula	▪ Rare	▪ Common ▪ Examples include perianal, enterocutanous, or rectovaginal fistula
Perianal disease	▪ Rare	▪ Common ▪ Examples include perianal fistula or deep anal fissure

Refer to UpToDate content on endoscopic diagnosis of inflammatory bowel disease for additional details.

Graphic 132365 Version 1.0

Colonic pseudopolyps in inflammatory bowel disease

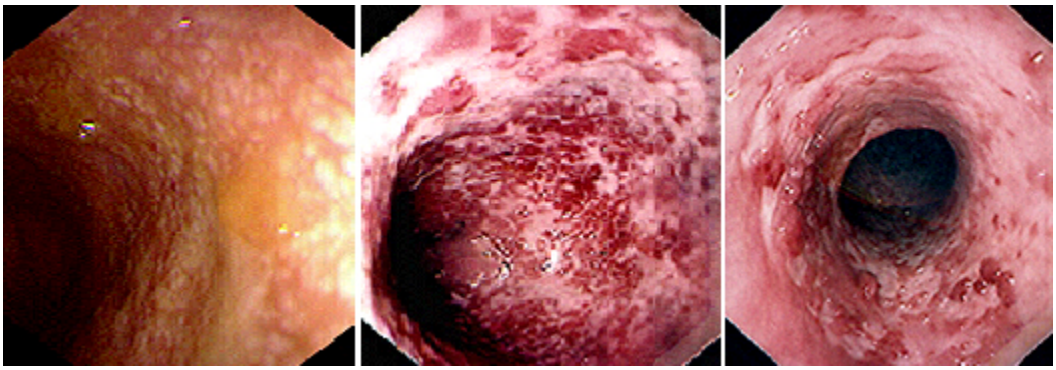


Endoscopy of pseudopolyps; these lesions are not specific to ulcerative colitis, although they are more common in this disorder than in Crohn disease.

Courtesy of James B McGee, MD.

Graphic 76729 Version 3.0

Continuous involvement of colonic lesions in ulcerative colitis

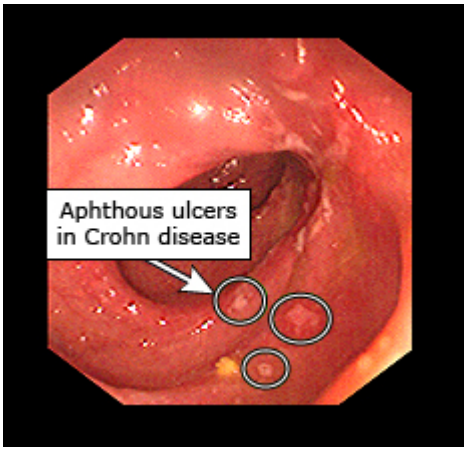


In contrast with Crohn disease, lower endoscopy in ulcerative colitis shows continuous and circumferential involvement, with no normal areas of mucosa.

Courtesy of James B McGee, MD.

Graphic 76332 Version 4.0

Aphthous lesions in Crohn disease

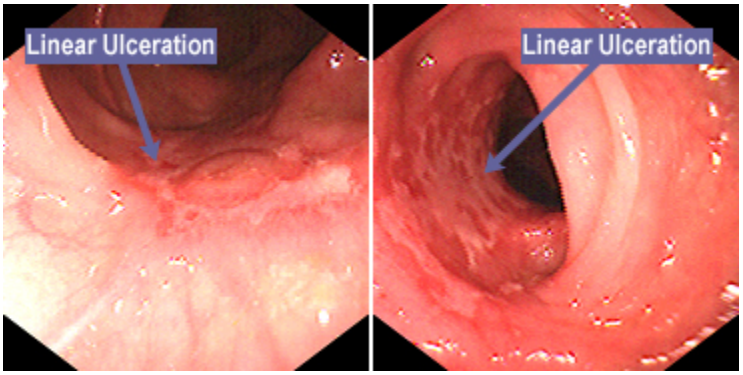


Colonoscopy demonstrates small discreet aphthous lesions (superficial ulcerations) that are characteristic of early lesions in Crohn disease.

Courtesy of James B McGee, MD.

Graphic 78561 Version 9.0

Linear ulcerations in Crohn disease

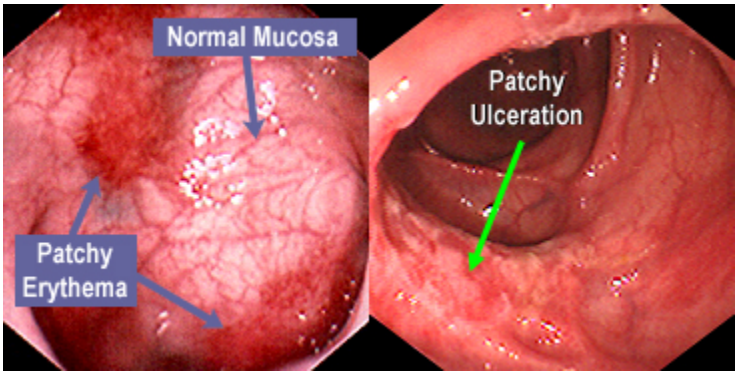


Colonoscopy shows linear ulcers that can course for several centimeters along the longitudinal axis of the colon in Crohn disease.

Courtesy of James B McGee, MD.

Graphic 68093 Version 4.0

Asymmetric distribution of lesions in Crohn disease



Colonoscopy in Crohn disease demonstrates the characteristic patchy erythema (left panel) and ulceration (right panel) that occur next to areas of normal mucosa.

Courtesy of James B McGee, MD.

Graphic 71769 Version 4.0

Contributor Disclosures

Michael A Roy, MD, FACP No relevant financial relationship(s) with ineligible companies to disclose. **John R Saltzman, MD, FACP, FACG, FASGE, AGAF** No relevant financial relationship(s) with ineligible companies to disclose. **Sunanda V Kane, MD, MSPH** Grant/Research/Clinical Trial Support: Bristol Myers Squibb [IBD]. Consultant/Advisory Boards: Boehringer Ingelheim [IBD]; Bristol Myers Squibb [IBD]; Fresenius Kabi [IBD]; InveniAI [IBD]; Janssen [IBD]; Lilly [IBD]; Takeda [IBD]; Techlab [IBD]. Other Financial Interest: PredicaMed [Scientific Board]. All of the relevant financial relationships listed have been mitigated. **Kristen M Robson, MD, MBA, FACG** No relevant financial relationship(s) with ineligible companies to disclose.

Contributor disclosures are reviewed for conflicts of interest by the editorial group. When found, these are addressed by vetting through a multi-level review process, and through requirements for references to be provided to support the content. Appropriately referenced content is required of all authors and must conform to UpToDate standards of evidence.

Conflict of interest policy

→