Imaging for Inflammatory Bowel Disease

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KEYWORDS

• Imaging • Inflammatory bowel disease • Crohn's disease • Ulcerative colitis
• CT enterography • MRI • MRE

KEY POINTS

- Plain abdominal radiographs can diagnose complications from inflammatory bowel disease and should be a first imaging study in critically ill patients to evaluate for free intraperitoneal air.
- Upper gastrointestinal series with small bowel follow through (SBFT) is useful in diagnosing stricturing Crohn's disease, and upper gastrointestinal series with SBFT may diagnose fistulas related to Crohn's disease.
- Abdominal computed tomographic (CT) scanning is usually the preferred initial radiographic imaging study in patients with inflammatory bowel disease; CT scans can evaluate the entire gastrointestinal tract and other intra-abdominal organs.
- MRI is a noninvasive, nonionizing imaging modality useful in evaluating intestinal and extraintestinal pathology, particularly in Crohn's disease.
- Capsule endoscopy (CE) provides state-of-the-art imaging of the mucosal lining of the intestines, particularly in the small bowel; CE is an expensive test but is outpatient, noninvasive, with no nonionizing radiation.

PLAIN RADIOGRAPHS

Introduction

Plain abdominal radiographs still play a role in imaging for inflammatory bowel disease (IBD) including diagnosing dilation, obstruction, bowel perforation, bowel wall thickening, or loss of haustral markings. Radiographs can be portable, are widely available, quick, painless, inexpensive, and have low radiation dose exposure making them a good initial diagnostic test in some scenarios (**Table 1**). However, plain radiographs do not give much detailed information and cannot make a definitive diagnosis of IBD.

Authors have nothing to disclose.
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Surg Clin N Am 95 (2015) 1143–1158
http://dx.doi.org/10.1016/j.suc.2015.07.007 **surgical.theclinics.com**
0039-6109/15/$ – see front matter Published by Elsevier Inc.

Table 1
Clinical relevance of plain radiograph findings

Plain Radiograph Findings	Clinical Relevance
Free air (pneumoperitoneum)	Perforated viscous
Thumbprinting	Colitis (ischemic, ulcerative, or infectious)
Megacolon	Colon dilated >6 cm, concern for perforation
Tubelike/lead-pipe/featureless	Chronic ulcerative colitis

Radiographs use invisible electromagnetic energy beams to produce images of internal tissues, bones, and organs on film. Standard radiographs are performed for many reasons. Abdominal radiographs may be taken with the patient in the upright position (erect abdominal view), lying flat with the exposure made from above the patient (supine abdominal view), or lying flat with the exposure made from the side of the patient (cross-table lateral view). The left side-lying position (left lateral decubitus view) may be used for patients who cannot stand erect.

A plain flat and upright abdominal radiograph should be the first imaging study in critically ill patients in whom a perforation is suspected. Perforation is identified by free air on an upright abdominal radiograph (Fig. 1) and should be ordered on any patient with acute onset abdominal pain. These images can be performed in most settings with portable radiograph machines and are widely available.

Patients with ulcerative colitis may exhibit "thumbprinting" on a plain abdominal radiograph. On radiograph the distance between loops of bowel is increased because of thickening of the bowel wall from inflammation (Fig. 2). Although classically described with ischemic colitis, this finding is also noted in other forms of colitis, including ulcerative and infectious colitis.[1]

Patients with fulminant colitis may be followed with serial abdominal radiographs to diagnose "toxic megacolon." Toxic megacolon is defined as dilation greater than 6 cm and is an indication for emergent surgical intervention to prevent perforation. Chronic

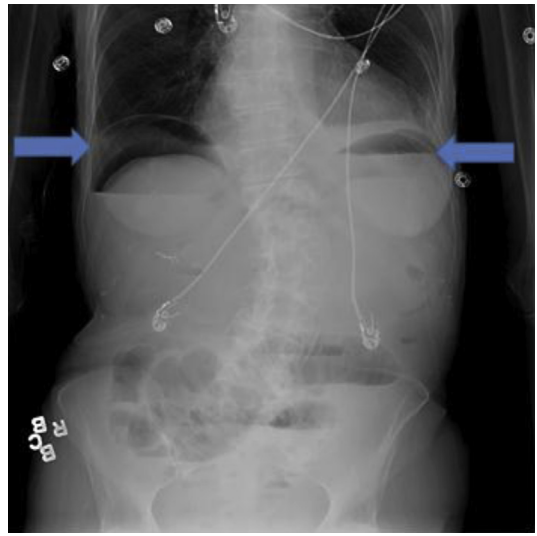

Fig. 1. An upright abdominal radiograph in a patient with known Crohn's disease and acute onset of abdominal pain. *Arrows* indicate pneumoperitoneum.