

PROBLEM

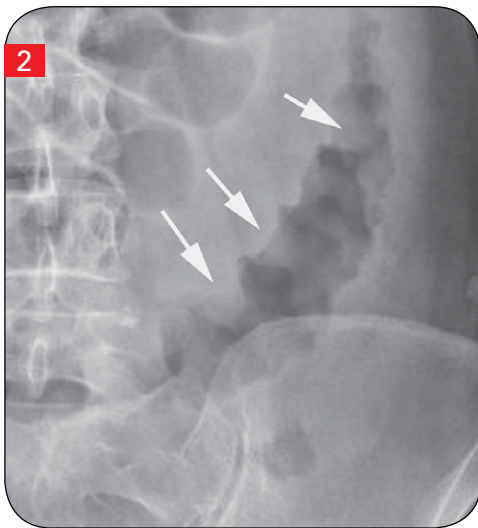


>> One week after being treated for a urinary tract infection, a 46-year-old woman returns to your hospital's ED, reporting abdominal pain and diarrhea. An abdominal radiograph is obtained (Figure 1).

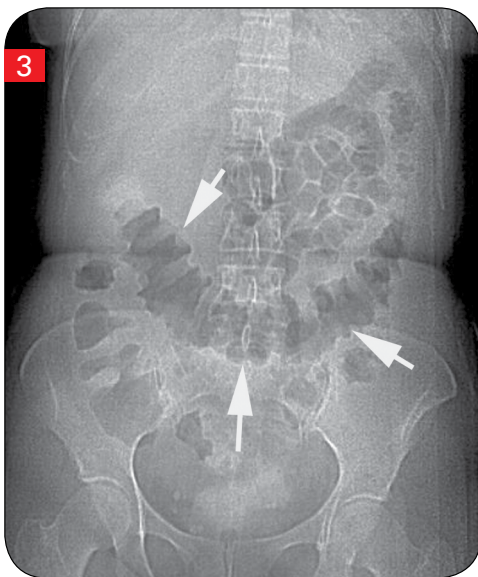
What is your diagnosis?

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ANSWER



>> The abdominal radiograph shows air throughout nondilated large and small bowel, thereby ruling out a small bowel obstruction. However, there is an abnormal appearance to the transverse colon. There is nodular thickening of the haustral folds (white arrows, Figure 2). This appearance has been described as “thumbprinting,” as the thickened folds make thumbprint-like impressions on the air contained within the colon. These thickened folds are again seen on the scout film from a CT study ordered for the same patient (white arrows, Figure 3). An axial slice from this patient’s CT examination (Figure 4) directly demonstrates the multiple areas of wall thickening (white arrows), as well as areas of pericolonic inflammatory change (asterisks).



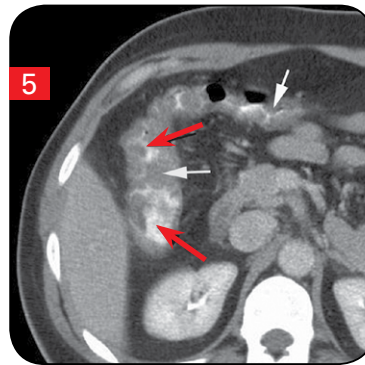
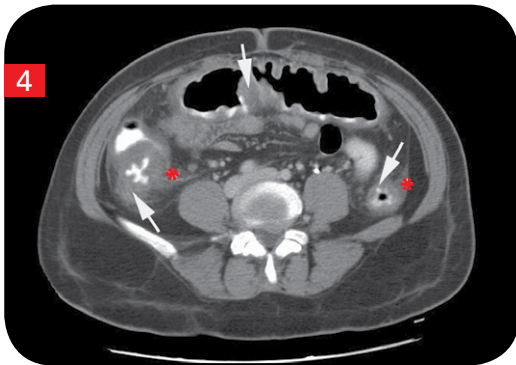
Thumbprinting, which indicates mucosal edema, has a differential diagnosis that includes infectious colitis (pseudomembranous colitis [PMC], cytomegalovirus, parasitic colitis); inflammatory bowel disease (ulcerative colitis, Crohn’s disease); bowel wall hemorrhage (trauma, vasculitis, coagulopathy); and ischemic colitis. Less commonly, lymphoma and hematogenously spread metastases may also present radiographically as thumbprinting of the colon.

In our patient, the history of antibiotic treatment for a urinary tract infection suggested the diagnosis of PMC, an infectious colitis caused by the uninhibited growth of *Clostridium difficile*. PMC usually results from a decrease in normal bowel flora secondary to antibiotic treatment. However, it may also occur after abdominal surgery or with prolonged obstruction or ischemia. Its frequency is increased in immunocompromised patients. PMC may result in

significant morbidity; mortality rates range between 1% and 4%.¹

Radiographs may show colonic ileus, small bowel ileus, ascites, or haustral thickening (thumbprinting). Radiographic abnormalities are identified in approximately one-third of PMC cases.² On CT, PMC is demonstrated by wall thickening, pericolonic inflammatory changes, and ascites. Typically, the surrounding inflammation is mild compared to the degree of wall thickening. Findings may either involve the entire colon or be segmental. Figure 5 shows the “accordion sign,” a typical CT presentation of PMC, in which high-density contrast (red arrows) is trapped between the low-density edematous mucosa and submucosa (white arrows). Use of CT in identifying *C difficile*-associated colitis has been shown

ANSWER



to be 70% sensitive and 93% specific, with a positive predictive value of 88%, when the diagnostic criteria include bowel wall thicker than 4 mm along with other aforementioned signs, such as the accordion sign.³

References

1. Kawamoto S, Horton KM, Fishman EK. Pseudomembranous colitis: spectrum of imaging findings with clinical and pathologic correlation. *Radiology*. 1999;19(4):887-897.
2. Boland GW, Lee MJ, Cats A, Mueller PR. Pseudomembranous colitis: diagnostic sensitivity of the abdominal plain radiograph. *Clin Radiol*. 1994;49(7):473-475.
3. Kirkpatrick ID, Greenberg HM. Evaluating the CT diagnosis of *Clostridium difficile* colitis: should CT guide therapy? *AJR Am J Roentgenol*. 2001;176(3):635-639.

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