American College of Radiology
ACR Appropriateness Criteria®

Clinical Condition: **Left Lower Quadrant Pain**

Variant 1: **Older patient with typical clinical presentation for diverticulitis.**

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen and pelvis with oral and IV contrast	8		High
CT abdomen and pelvis with oral IV and colonic contrast	7	Indicated when visualization of colon lumen might be helpful.	High
X-ray colon barium enema double-contrast	6		Med
CT abdomen and pelvis without contrast	6		High
CT abdomen and pelvis with colonic contrast	6		High
X-ray colon barium enema single-contrast	5		Med
X-ray colon water soluble contrast enema	5		Med
US abdomen transabdominal graded compression	5		None
X-ray abdomen and pelvis	5		Low
US abdomen transrectal or transvaginal	4		None
MRI abdomen and pelvis	4		None
NUC scintigraphy abdomen and pelvis	2		IP
Rating Scale: 1=Least appropriate, 9=Most appropriate			*Relative Radiation Level

Clinical Condition: **Left Lower Quadrant Pain**

Variant 2: **Acute, severe, with or without fever.**

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen and pelvis with oral and IV contrast	8		High
CT abdomen and pelvis with oral IV and colonic contrast	7	Indicated when visualization of colon lumen might be helpful.	High
CT abdomen and pelvis without contrast	6		High
CT abdomen and pelvis with colonic contrast	6		High
X-ray abdomen and pelvis	6		Low
US abdomen transabdominal graded compression	5		None
X-ray colon water soluble contrast enema	4		Med
X-ray colon barium enema single-contrast	4		Med
X-ray colon barium enema double-contrast	4		Med
US abdomen transrectal or transvaginal	4		None
MRI abdomen and pelvis	3		None
NUC scintigraphy abdomen and pelvis	2		IP
Rating Scale: 1=Least appropriate, 9=Most appropriate			*Relative Radiation Level

Variant 3: **Chronic, intermittent, or low grade.**

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen and pelvis with oral and IV contrast	8		High
X-ray colon barium enema double-contrast	7		Med
CT abdomen and pelvis with oral IV and colonic contrast	7	Indicated when visualization of colon lumen might be helpful.	High
X-ray colon barium enema single-contrast	6		Med
CT abdomen and pelvis with colonic contrast	6		High
X-ray colon water soluble contrast enema	5		Med
US abdomen transabdominal graded compression	5		None
CT abdomen and pelvis without contrast	5		High
X-ray abdomen and pelvis	5		Low
US abdomen transrectal or transvaginal	4		None
MRI abdomen and pelvis	4		None
NUC scintigraphy abdomen and pelvis	2		IP
Rating Scale: 1=Least appropriate, 9=Most appropriate			*Relative Radiation Level

Clinical Condition: **Left Lower Quadrant Pain**

Variant 4: **Woman of childbearing age.**

Radiologic Procedure	Rating	Comments	RRL*
US abdomen transabdominal graded compression	8	Could be done first to exclude gynecologic abnormality.	None
US abdomen transrectal or transvaginal	8	Could be done first to exclude gynecologic abnormality.	None
CT abdomen and pelvis with oral and IV contrast	7		High
CT abdomen and pelvis with oral IV and colonic contrast	7	Indicated when visualization of colon lumen might be helpful.	High
X-ray colon barium enema double-contrast	6		Med
CT abdomen and pelvis with colonic contrast	6		High
X-ray colon barium enema single-contrast	5		Med
CT abdomen and pelvis without contrast	5		High
X-ray abdomen and pelvis	5		Low
MRI abdomen and pelvis	5		None
X-ray colon water soluble contrast enema	4		Med
NUC scintigraphy abdomen and pelvis	2		IP
Rating Scale: 1=Least appropriate, 9=Most appropriate			*Relative Radiation Level

Variant 5: **Obese patient.**

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen and pelvis with oral and IV contrast	8		High
CT abdomen and pelvis with oral IV and colonic contrast	7	Indicated when visualization of colon lumen might be helpful.	High
CT abdomen and pelvis with colonic contrast	6		High
X-ray colon water soluble contrast enema	5		Med
X-ray colon barium enema single-contrast	5		Med
X-ray colon barium enema double-contrast	5		Med
CT abdomen and pelvis without contrast	5		High
X-ray abdomen and pelvis	5		Low
US abdomen transabdominal graded compression	4		None
US abdomen transrectal or transvaginal	4		None
MRI abdomen and pelvis	4		None
NUC scintigraphy abdomen and pelvis	2		IP
Rating Scale: 1=Least appropriate, 9=Most appropriate			*Relative Radiation Level

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Summary of Literature Review

The most common cause of left lower quadrant pain in adults is acute sigmoid diverticulitis, which is estimated to occur in 20%-25% of patients with diverticulosis. Appropriate imaging triage for patients with suspected diverticulitis (ie, left lower quadrant pain) should address two major clinical questions: 1) what are the differential diagnostic possibilities in this clinical situation and 2) what information is necessary to make a definitive management decision. Some patients with acute diverticulitis may not require any imaging, notably those with typical symptoms of diverticulitis (eg, left lower quadrant pain and tenderness, fever) or those with a previous history of diverticulitis who present with clinical symptoms of recurrent disease. Many such patients are treated medically without undergoing radiologic examinations, but diverticulitis can be simulated by other acute abdominal disorders. Furthermore, 15%-30% of patients with diverticulitis require surgery because of associated abscesses, fistulas, obstruction, or perforation. As a result, there has been a trend toward greater use of radiologic imaging tests to confirm the diagnosis of diverticulitis, evaluate the extent of disease, and detect complications before treatment.

Abdominal plain films are of limited value in evaluating diverticulitis unless complications such as free perforation (pneumoperitoneum) or obstruction are suspected. Nuclear medicine imaging appears to have little role in the evaluation of left lower quadrant pain. The role of magnetic resonance imaging (MRI) has not been adequately evaluated, but preliminary data suggest that it may have diagnostic potential in patients with suspected diverticulitis. The two imaging tests most often used for diagnosing diverticulitis are the contrast enema and computed tomography (CT), but graded compression sonography has also been used.

In the past, the contrast enema was the primary imaging test for diverticulitis. Some authors were reluctant to perform contrast enemas during an acute episode of diverticulitis because of concern about colonic perforation. Others recommended the use of water-soluble contrast media to avoid contaminating the peritoneal cavity with barium if perforation occurred. However, many studies have shown that single-contrast or even double-contrast barium enemas can be safely performed during the acute episode if there are no clinical signs of perforation. The barium enema has a reported sensitivity of 59%-90% in diagnosing sigmoid diverticulitis. It can also be used to detect other colonic diseases (eg, ischemic colitis, inflammatory bowel disease) that cause similar clinical findings. Finally, it is a relatively low-cost examination that is available in nearly all imaging departments. Although CT has replaced the contrast enema as the initial imaging test for diverticulitis in most patients, the contrast enema may be helpful as a follow-up study for patients in whom the CT findings cannot unequivocally differentiate diverticulitis from colonic carcinoma. Also, some patients with chronic or low-grade diverticulitis may initially be evaluated by contrast enema because of altered bowel habits without other typical clinical findings of diverticulitis. The contrast enema therefore should be considered complementary to CT for evaluating these patients.

CT is now widely advocated as the primary imaging test for evaluating patients with suspected sigmoid diverticulitis because of its high sensitivity and specificity and its ability to diagnose other causes of left lower quadrant pain that mimic diverticulitis. It is less invasive than the contrast enema and has a reported sensitivity of 79%-99%. CT also has a major role in determining disease extent; this assessment is rarely possible with contrast enema. By assessing the presence and extent of abscess formation, CT facilitates selection of patients for medical versus surgical therapy. When abscesses are present, it has been shown that CT-guided percutaneous drainage of abscess collections can eliminate multistage operative procedures and, in some cases, can eliminate the need for surgery entirely. Finally, CT can demonstrate extracolonic diseases (eg, genitourinary and gynecologic abnormalities) that have a similar clinical presentation.

A variety of contrast media have been used for CT to optimize the sensitivity and specificity of the examination, including oral and intravenous contrast agents and rectally administered contrast or air. Many authors currently advocate the routine use of rectal

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contrast material to improve colonic distention and increase the accuracy of the examination for detecting diverticulitis.

Although most of the reported experience has been with CT, transabdominal sonography has been advocated as an alternative technique for evaluating patients with suspected diverticulitis. Graded compression sonography is reported to have a sensitivity of 77%-98% and a specificity of 80%-99% in diagnosing diverticulitis. Some investigators advocate the select use of transrectal sonography to improve detection of diverticulitis if the findings on transabdominal sonography are negative or equivocal. Sonography is particularly of value when left lower quadrant pain and fever occurs in women of childbearing age. In this setting, gynecologic processes such as ectopic pregnancy and pelvic inflammatory disease are also important diagnostic considerations. Sonography is therefore an excellent choice for the initial imaging of this patient population, because it is more sensitive than CT or contrast enemas in detecting gynecologic abnormalities that cause left lower quadrant pain. However, graded compression sonography is a technique that is highly operator dependent.

Finally, it should be recognized that a perforated colon cancer can mimic both the clinical and radiographic findings of diverticulitis. An argument could therefore be made that patients with equivocal CT findings of diverticulitis should undergo a follow-up examination of the colonic mucosa after the acute symptoms have resolved. Either a colonoscopy or barium enema could be performed to differentiate healing diverticulitis from a perforated colon cancer in these patients.

In summary, CT is now widely advocated as the primary imaging test for evaluating acute sigmoid diverticulitis because of its high sensitivity and specificity, its ability to determine the presence and extent of disease that might warrant percutaneous catheter drainage or surgery, and its ability to demonstrate extracolonic disease in these patients. Nevertheless, the contrast enema remains a useful follow-up test for patients with equivocal CT findings. Alternatively, the contrast enema or sonography can be performed as the primary imaging test for suspected diverticulitis, depending on the availability of these various modalities and the experience and preferences of the examining radiologist.

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