Clinical Condition: Suspected Small Bowel Obstruction

Variant 1: Suspected complete or high-grade partial SBO.

<table>
<thead>
<tr>
<th>Radiologic Procedure</th>
<th>Rating</th>
<th>Comments</th>
<th>RRL*</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT abdomen and pelvis without oral contrast with IV contrast</td>
<td>8</td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>X-ray abdomen supine and upright</td>
<td>7</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>CT abdomen and pelvis with oral water soluble contrast with IV contrast</td>
<td>5</td>
<td>Positive contrast in the bowel can obscure the etiology of the obstruction and enhancement of the mucosal bowel lumen.</td>
<td>High</td>
</tr>
<tr>
<td>CT abdomen and pelvis with oral dilute barium contrast with IV contrast</td>
<td>5</td>
<td>Positive contrast in the bowel can obscure the etiology of the obstruction and enhancement of the mucosal bowel lumen.</td>
<td>High</td>
</tr>
<tr>
<td>CT enterography with IV and water or water density contrast</td>
<td>4</td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>CT enteroclysis</td>
<td>4</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>X-ray small bowel follow-through</td>
<td>4</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>X-ray small bowel enteroclysis</td>
<td>4</td>
<td></td>
<td>Med</td>
</tr>
<tr>
<td>MRI abdomen</td>
<td>4</td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>US abdomen</td>
<td>2</td>
<td></td>
<td>None</td>
</tr>
</tbody>
</table>

Rating Scale: 1=Least appropriate, 9=Most appropriate

*Relative Radiation Level (RRL)
### Clinical Condition:

**Suspected Small Bowel Obstruction**

### Variant 2:

**Suspected intermittent or low-grade SBO.**

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**Rating Scale:** 1=Least appropriate, 9=Most appropriate  

**Rating Level:**  

*Relative Radiation Level*
SUSPECTED SMALL BOWEL OBSTRUCTION

There is no single generally accepted approach to evaluate patients with suspected small bowel obstruction (SBO). This, in part, reflects not only the differing perspectives of investigators who have written on the topic (surgeons and radiologists) but also the increasing application of sophisticated imaging studies. The diagnostic approach also depends upon the clinical presentation, ie, acute high-grade vs low-grade or intermittent [1].

Plain film radiography has been the traditional starting point for imaging evaluation of suspected SBO. It must be conceded, however, that studies testing the utility of plain film have yielded quite disparate results [2-5]. While some investigators report 80%-90% success in diagnosing SBO using radiographs [5], an overall accuracy equal to that of computed tomography (CT) [6], others have achieved rates only in the 30%-70% range [3,4,6]. In some even less encouraging studies, abdomen films have proved to be of little to no help in assessing the site or cause of SBO [6,7], or even to be misleading in 20%-40% of patients [3].

In light of these inconsistent results, it is reasonable to expect that abdomen radiographs will not be definitive in many patients with suspected SBO. In such a setting, gastrointestinal contrast studies (small bowel follow-through (SBFT), enteroclysis, barium enema) or cross-sectional imaging studies (CT, ultrasound (US), magnetic resonance imaging (MRI)) are options.

The single contrast barium enema with attempted reflux into the distal ileum can exclude colonic obstruction and may occasionally aid in distinguishing SBO from an ileus [9,10]. It is unreliable, however, for localizing and characterizing the site of SBO [9,11], as well as for identifying patients who will need surgery [11].

Opinion is divided on the usefulness of SBFT with orally administered barium. Some investigators have found this study useful for management of suspected SBO in 68%-100% of cases [10-12]. Because SBFT suffers from nonuniform small bowel filling, inability to test distensibility, and limitations posed by intermittent fluoroscopy, some authorities argue that enteroclysis is the appropriate examination in problematic SBO cases [9,13,14].

Methods of examination that challenge the distensibility of the small bowel, such as standard or CT enteroclysis, offer improved sensitivity and specificity over standard barium small bowel and CT exams in evaluating suspected intermittent or low-grade small bowel obstruction [1,3,9,15,16]. Evidence is compelling that enteroclysis is highly reliable in pinpointing sites of low- and high-grade obstruction [13,17,18], as well as in distinguishing adhesions from obstructing neoplasms [13]. CT enteroclysis (CT-E) should be considered as an alternative, especially in patients with a history of malignancy [1]. Enteroclysis has low patient acceptance and is dependent on the skill of the radiologist performing the examination.

CT enterography does not require intubation of the small bowel and therefore has greater patient acceptance and is less dependent on the technical skill of the radiologist. CT enterography with a water density contrast agent offers an alternative to CT enteroclysis, particularly where there is reluctance to use pharmacologic manipulation of small bowel activity. This is particularly true in patients with partial or intermittent small bowel obstruction. Its clinical usefulness in this clinical scenario has not yet been convincingly established, however.

Evaluation of suspected small bowel obstruction with oral water-soluble contrast agents is controversial. Some authors point out that this technique is disadvantageous because of the potential for intravascular volume depletion and electrolyte imbalance, plus the poorer imaging characteristics as compared with barium [9,20]. Others have found both low osmolar and high osmolar water-soluble agents to be useful in diagnosis, amelioration, and high-grade obstruction [13,17,18], as well as in distinguishing adhesions from obstructing neoplasms [13]. CT enteroclysis (CT-E) should be considered as an alternative, especially in patients with a history of malignancy [1]. Enteroclysis has low patient acceptance and is dependent on the skill of the radiologist performing the examination.

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Convincing studies have confirmed the usefulness of the standard CT examination in suspected high-grade SBO. Diagnostic accuracy of more than 90% has been reported [4,5,27], with success in distinguishing SBO from ileus [28] and in identifying the cause of obstruction [3,27]. Patients with suspected high grade obstruction do not require additional oral contrast medium since the fluid in the bowel provides adequate contrast. Low-grade obstruction is a relative “blind spot” for standard CT. One study demonstrated correct diagnosis in fewer than half of such cases [15]. Newer multidetector (MDCT) scanners with MPR capabilities have been noticeably more effective in evaluating SBO and other abdominal pathology, particularly when coronal reconstructions are added. CT is an excellent means of detecting complications of bowel obstruction such as ischemia and strangulation [29-33].

Largely because of the success of enteroclysis and CT in strangulation [29-33], complications of bowel obstruction such as ischemia and added. CT is an excellent means of detecting pathology, particularly when coronal reconstructions are added. CT proved superior to US in evaluating suspected high-grade SBO. The barium enema and small bowel examination play a less significant role and should not be used as a primary modality in the diagnosis of acute small bowel obstruction.

If intermittent or low-grade small bowel obstruction is a chief diagnostic concern, standard or CT-E is appropriate [1,3,15,16]. CT-E offers several advantages over standard CT and enteroclysis techniques, but its role in evaluation of small bowel obstruction is unclear at this time.

References


ACR Appropriateness Criteria®

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An ACR Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the FDA have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

ACR Appropriateness Criteria®

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