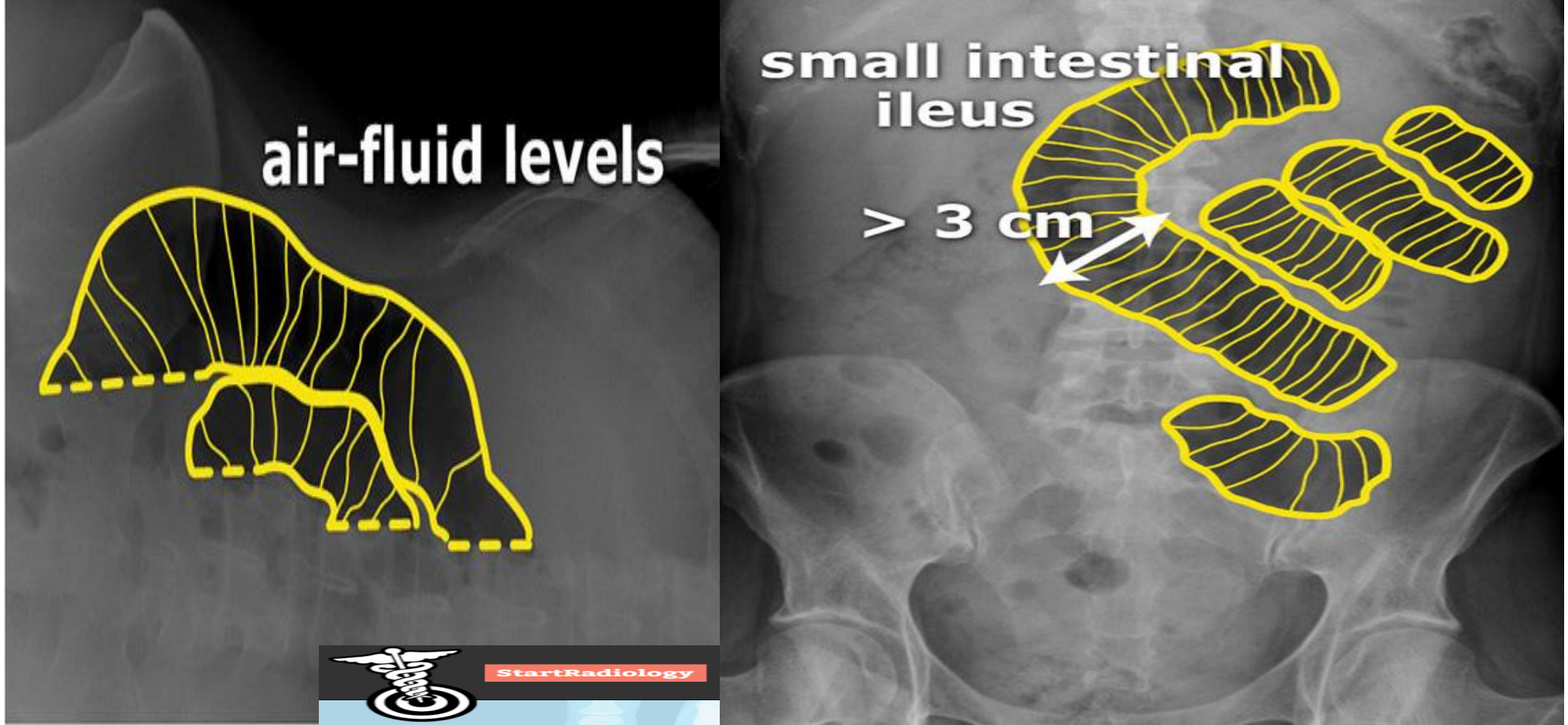


# İleus-Subileus; Lavman ve Görüntüleme



# İleus-Subileus; Lavman ve Görüntüleme

- Barsak pasajından gıda ve barsak içeriklerinin düzenli geçişinin olmaması.
- “to twist” kelimesinden köken alır.
- failure of appropriate forward movement of bowel contents.
- It may be secondary to either mechanical obstruction of the bowel (*mechanical ileus*) or a disturbance in neural stimulation (*adynamic ileus*). Ileus is a surgical emergency that may or may not require surgical intervention; the cause needs to be established promptly.

## **The meaning of ileus. Its changing definition over three millennia.**

Ballantyne GH.

### **Abstract**

Ileus comes from the Greek word for twisted. The early classical literature suggests that this term was used for what we now call sigmoid volvulus. The Romans translated this word as volvulus. During later classical times, investigators used ileus and volvulus in describing conditions other than sigmoid volvulus. Roman investigators used ileus to describe midgut volvulus, intussusception, and incarcerated hernias because the symptoms of these conditions were similar. During the Renaissance, ileus, volvulus, and intussusception were synonymous and were closely linked to the vulgar terms iliac passion and Miserere Mei. The sine qua non of ileus was the clinical triad of abdominal pain, obstipation, and fecal vomiting. Autopsies in the 16th, 17th, and 18th centuries exposed the various causes of these symptoms. Ileus became the clinical diagnosis whereas such terms as intussusception were used to describe autopsy findings. Physicians classified diseases by symptoms not by cause. During the 19th century, emphasis switched to the pathologic basis of disease. The classification of intestinal obstruction became one of cause. Ileus was abandoned because its classical definition did not encompass all forms of intestinal obstruction. In the last 50 years, ileus has been relegated to mean nonmechanical obstruction that does not initially require operative treatment. Thus, ileus which was the twisted intestine of Asclepiades, the Miserere Mei of Paré and the iliac passion of Barrough, has come in the 20th century to mean nonmechanical intestinal obstruction.

# Adinamik ileus

mortality rate.

In contrast to a mechanical obstruction, a *neurogenic* or *functional* obstruction occurs as a result of disruption of the normal coordinated peristaltic activity of the gastrointestinal tract in the absence of a physical blockage within the intestinal lumen. This is also commonly referred to as an *adynamic ileus*. The causes of

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# Adynamik ileus

**Table 86-2 Key Features of Ileus and Mechanical Bowel Obstruction**

	<b>Ileus</b>	<b>Bowel Obstruction</b>
Pain	Mild to moderate	Moderate to severe
Location	Diffuse	May localize
Physical examination	Mild distention, $\pm$ tenderness, decreased bowel sounds	Mild distention, tenderness, high-pitched bowel sounds
Laboratory	Possible dehydration	Leukocytosis
Imaging	May be normal	Abnormal
Treatment	Observation, hydration, $\pm$ nasogastric tube	Nasogastric tube, surgery

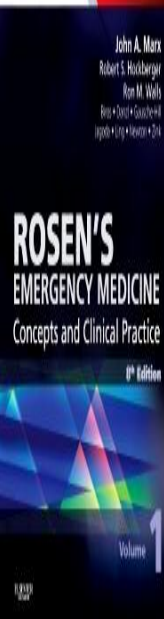
Sadece ince bağırsak değil kalın bağırsağı da içerir.  
Geçiş noktası yok.

## Box 92-2 Causes of Adynamic Ileus

Metabolic disease (especially hypokalemia)  
Medications (e.g., narcotics)  
Infection (retroperitoneal, pelvic, intrathoracic)  
Abdominal trauma  
Laparotomy



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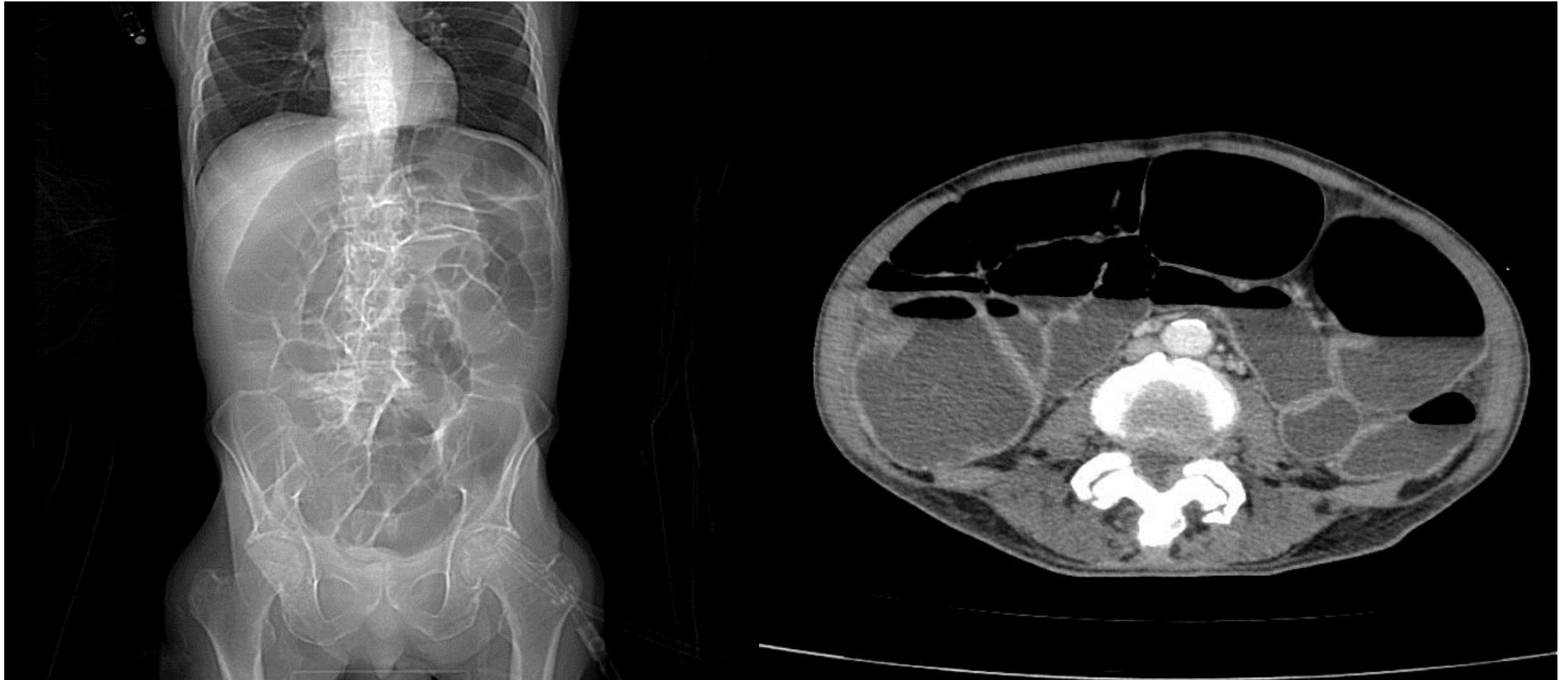


# Adinamik ileus





70 y, e= mekanik obst yok, elektrolit imbalansı



# Adinamik ileus





## Search Results for "Ileus"

## All Topics

☐ Adult☐ Pediatric☐ Patient **FREE**☐ Graphics 

- Postoperative ileus
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- Gastrointestinal dysmotility
  - Inflammation
  - Inhibitory neural reflexes
  - Neurohumoral peptides

## EPIDEMIOLOGY AND RISK

## FACTORS

## Postoperative ileus

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## INTRODUCTION

Postoperative paralytic ileus refers to obstipation and intolerance of oral intake due to nonmechanical factors that disrupt the normal coordinated propulsive motor activity of the gastrointestinal tract following abdominal or nonabdominal surgery [1-3]. There is general consensus that some degree of postoperative ileus is a normal obligatory and physiologic response to abdominal surgery [4,5]. Physiologic postoperative ileus is generally a benign condition that resolves without serious sequelae. However, when ileus is prolonged, it leads to patient discomfort, dissatisfaction, and prolonged hospitalization, and it must be differentiated from mechanical bowel

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# Post operative İleus



- Görünüm olarak mekanik obstrüksiyona benzer.
- Karın üzerinden merkezi olarak yansıyan hava ile dolu birçok bağırsak segmenti bulunmaktadır.
- sezeryan sonrası kolik tarzda olmayan uzamış ağrı-spontan iyileşme



# SMALL BOWEL OBSTRUCTION

## İleus: Günlük Pratikte Radyolojik Yaklaşım

Ileus: Radiological Approach in Daily Practice

Hülya Kurtul Yıldız<sup>1</sup>, Elif Evrim Ekin<sup>1</sup>, Aylin Hasanefendioğlu Bayrak<sup>1</sup>, İsmail Sinan Duman<sup>1</sup>, Samed Sayar<sup>2</sup>, Gökhan Tolga Adaş<sup>2</sup>

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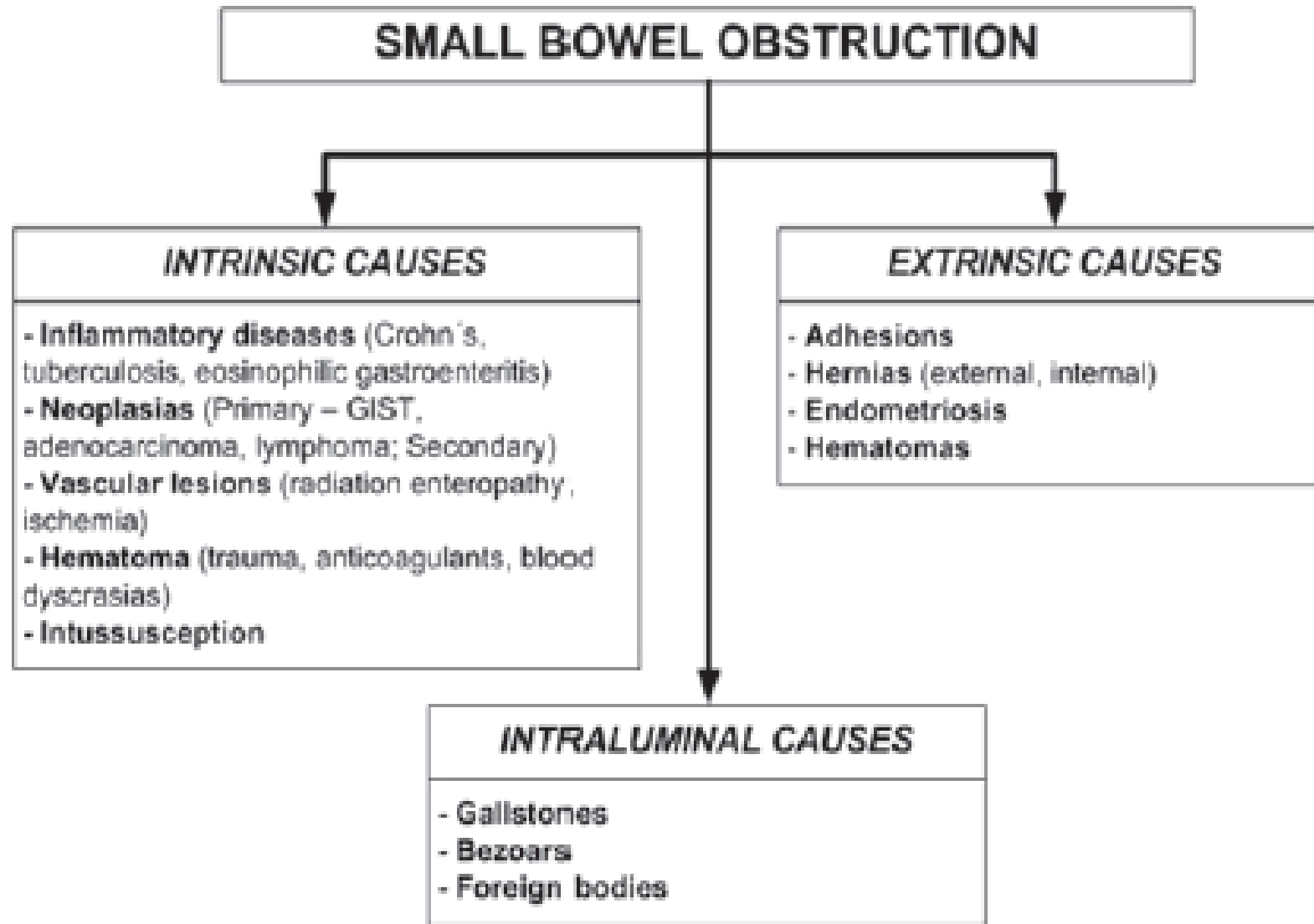
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DOI: 10.5152/jarem.2016.1087

## KAYNAKLAR

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2. Torreggiani WC, Harris AC, Lyburn ID, al-Nakshabandi NA, Zwirowich CV, Brenner C, et al. Computed tomography of acute small bowel obstruction: pictorial essay. Can Assoc Radiol J 2003; 54: 93-9.
3. Fukuya T, Hawes DR, Lu CC, Chang PJ, Barloon TJ. CT diagnosis of small-bowel obstruction: efficacy in 60 patients. AJR Am J Roentgenol 1992; 158: 765-9. [CrossRef]



**Figure 9.** Causes of SBO. *GIST* = gastrointestinal stromal tumor.

# American College of Radiology ACR Appropriateness Criteria®

**Clinical Condition:** Suspected Small-Bowel Obstruction

**Variant 1:** Suspected high-grade small-bowel obstruction (SBO), based on clinical evaluation or initial radiography (if performed).

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen and pelvis with IV contrast	9	Oral contrast should not be used if high-grade SBO is known or suspected. Oral contrast will not reach the site of obstruction, wastes time, adds expense, can induce further patient discomfort, will not add to diagnostic accuracy, and can lead to complications, particularly vomiting and aspiration.	☹ ☹ ☹ ☹
CT abdomen and pelvis without IV contrast	7	Perform this procedure in patients who have known or suspected high-grade SBO when IV contrast is contraindicated.	☹ ☹ ☹ ☹
MRI abdomen and pelvis without and with IV contrast (routine)	6	MRI is most appropriate in children and younger adult patients who have had multiple prior CT examinations.	○
X-ray abdomen and pelvis	5	Perform this procedure if it has not already been performed.	☹ ☹ ☹
CT abdomen and pelvis without and with IV contrast	4		☹ ☹ ☹ ☹
MRI abdomen and pelvis without IV contrast (routine)	4	MRI is most appropriate for pregnant women, children, and younger adult patients who have had multiple prior CT examinations.	○
X-ray small bowel follow-through	4	This procedure has a limited role if a high-grade obstruction has been confirmed by radiography or CT/MRI. Perform the x-ray with water-soluble contrast material, and use iso- or low-osmolar contrast material if there is a risk of aspiration.	☹ ☹ ☹
CT enteroclysis	3	This procedure may not be readily available at most institutions or radiology practices. Generally, it is not indicated in the acute setting. This procedure has a limited role if	☹ ☹ ☹ ☹

US abdomen and pelvis

2

○

**Rating Scale:** 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate

\*Relative  
Radiation Level



# Small bowel obstruction-imaging

## Abdominal radiography

- % 64-82 sensitivite, % 79-83 spesifite
- Tıkanıklığın proksimal kısmında dilatasyon distal kısmı normal
- Transvers çap > 3 cm (from outer wall to outer wall)
- Kolon normal görünümde



February 2012, Volume 198, Number 2

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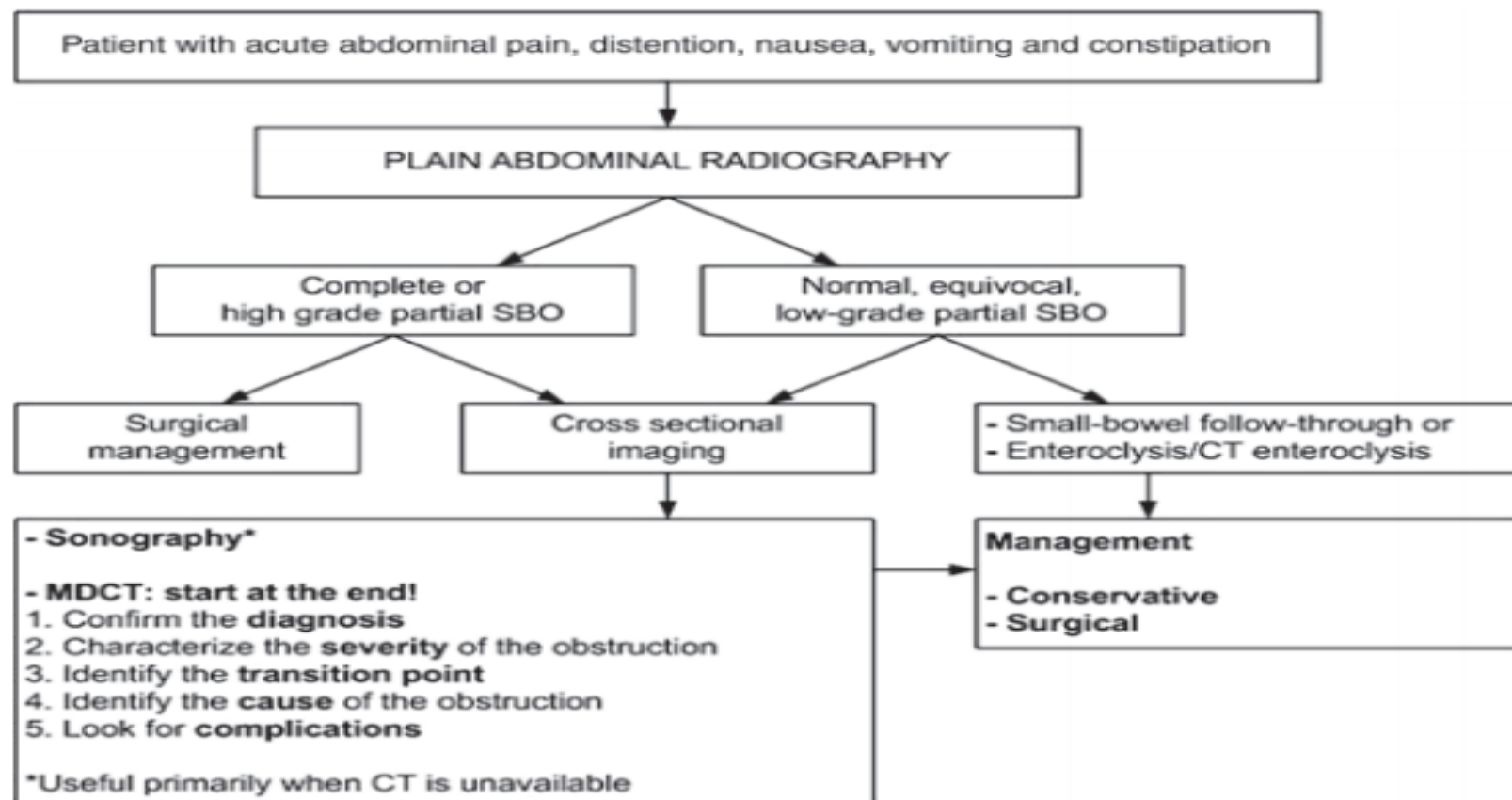
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### Small Bowel Obstruction

Charles P. Mullan<sup>1</sup>, Bettina Siewert<sup>1</sup> and Ronald L. Eisenberg<sup>1</sup>

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**Affiliation:** <sup>1</sup> All authors: Department of Radiology, Beth Israel Deaconess Medical Center, Harvard Medical School, 330 Brookline Ave, Boston, MA 02115.



**Figure 1.** Algorithm for imaging work-up of patients suspected to have SBO. *MDCT* = multidetector CT.

# EDUCATION EXHIBIT

423

## Small Bowel Obstruction: What to Look For<sup>1</sup>

Ana Catarina Silva, MD • Madalena Pimenta, MD • Luís S. Guimarães, MD

**TEACHING  
POINTS**  
See last page

## Abdominal Radiography Findings in Small-Bowel Obstruction Relevance to Triage for Additional Diagnostic Imaging

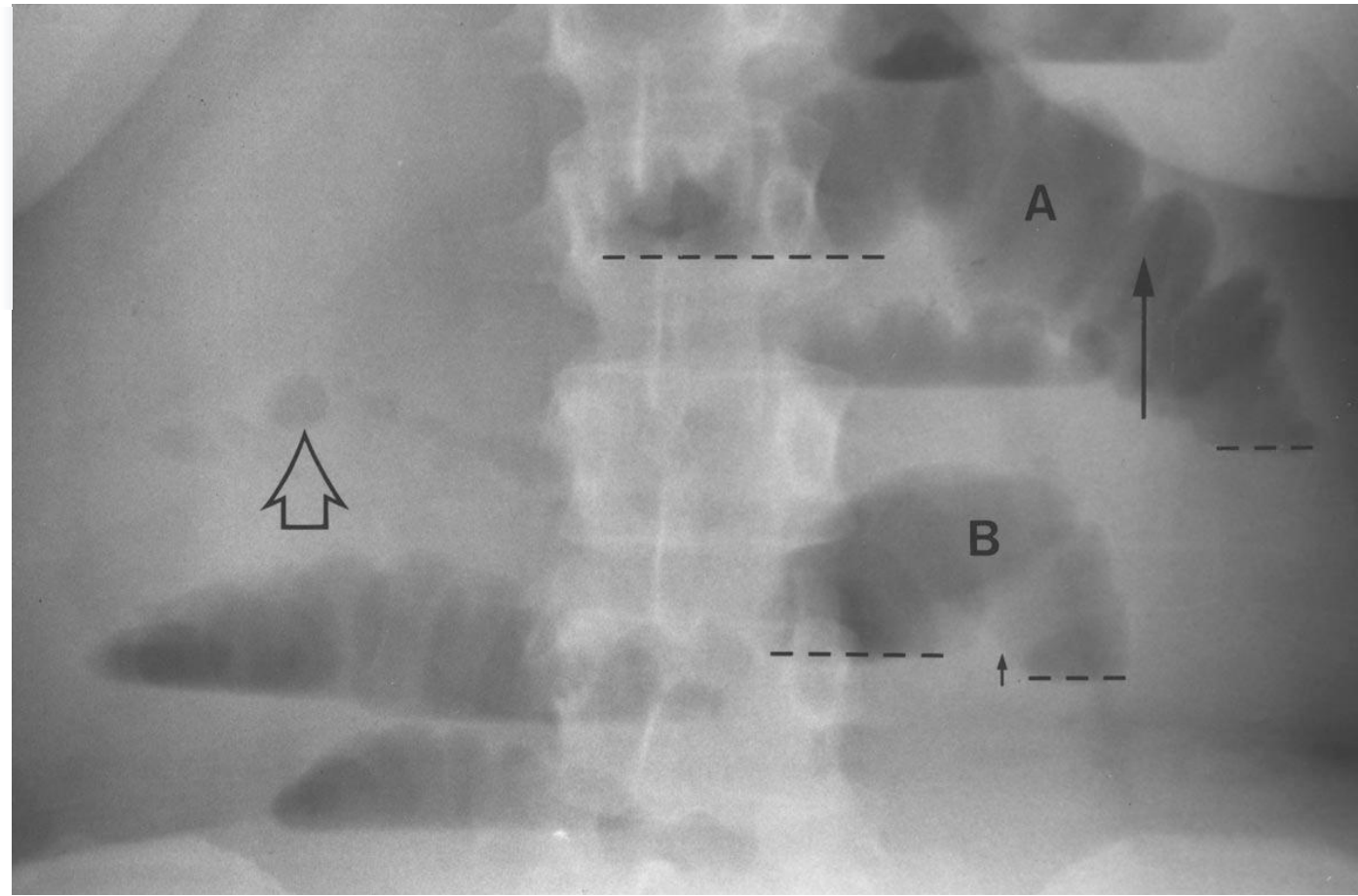
John C. Lappas<sup>1</sup>, Benedicto L. Reyes<sup>2</sup> and Dean D. T. Maqilinte<sup>3</sup>

**OBJECTIVE.** Our aim was to determine which findings on abdominal radiography are relevant for distinguishing complete or high-grade partial small-bowel obstruction from low-grade partial or no small-bowel obstruction.

**MATERIALS AND METHODS.** Admitting abdominal radiographs with the patients in the supine and upright positions were scored for 25 different findings in 81 patients with clinically suspected small-bowel obstruction. Forty-one patients had complete or high-grade partial small-bowel obstruction, and 40 had low-grade partial small-bowel obstruction or no obstruction as determined by enteroclysis examination. Abdominal radiography findings were subjected to statistical analysis for correlation with degree of obstruction.

**RESULTS.** Of 12 radiographic findings strongly associated ( $p < 0.05$ ) with the severity of obstruction, two findings were found to be the most significant ( $p \leq 0.0003$ ) and predictive of a higher grade small-bowel obstruction: the presence of air-fluid levels of differential height in the same small-bowel loop and the presence of a mean air-fluid level width greater than or equal to 25 mm on upright abdominal radiographs.

**CONCLUSION.** When both critical findings are present, the degree of small-bowel obstruction is likely high-grade or complete. When both signs are absent, small-bowel obstruction is likely low-grade or nonexistent. Upright abdominal radiographs are important in the examination of patients with suspected small-bowel obstruction and may contribute to the imaging triage of these patients.



41 hasta yüksek derecede SBO-

40 hasta düşük derecede SBO veya normal

Abdominal grafide 25 bulgunun tanısal değerine bakılmış.

2 bulgu yüksek anlamlılık düzeyine sahip:

1-bağırsak distansiyon > 25 mm

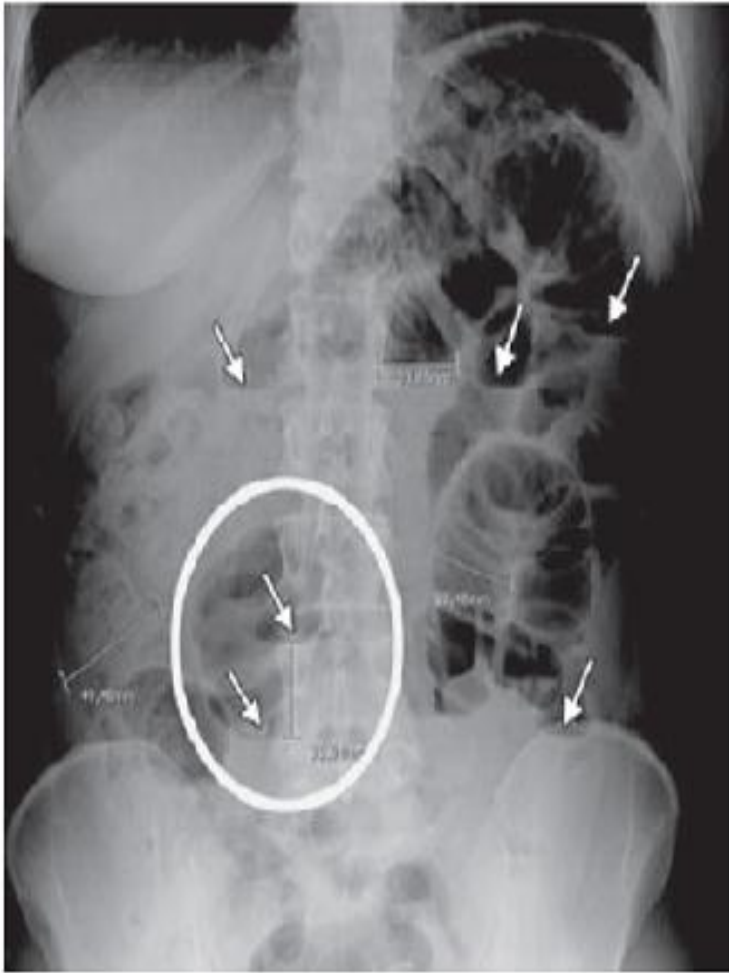
2-aynı bağırsak segmentinde farklı yükseklikteki hava sıvı seviyelenmeleri

36 yaş, kadın hasta, yüksek derecede parsiyel bağırsak obstrüksiyonu. A ve B bağırsak segmentlerinde farklı yüksekliklerde hava sıvı seviyeleri. Aynı bağırsak segmentinde hava-sıvı seviyelerinin vertikal ölçümü.

A segmenti=31 mm, B segmenti 5 mm (vertikal ölçüm)

Boncuk ipliği şeklinde dizilmiş hava-sıvı seviyelenmeleri (<10 mm) (açık ok)



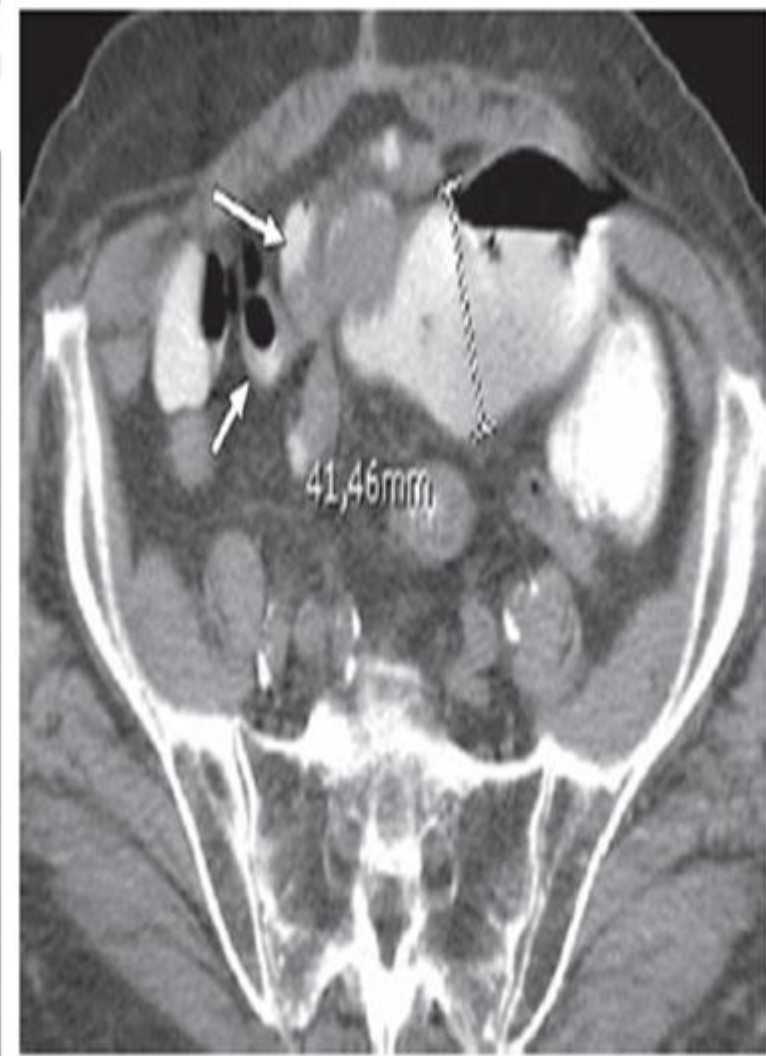


Yüksek-dereceli SBO. Abdominal grafide bir çok hava-sıvı seviyelenmeleri. Bazılarının genişliği  $>2.5$  cm.  $>2$  cm aynı bağırsak segmentlerin hava-sıvı seviyelenmeleri arasındaki vertikal ölçüm (circle area).

Ince bağırsak segmenti/kolon distansiyon  $>0.5$



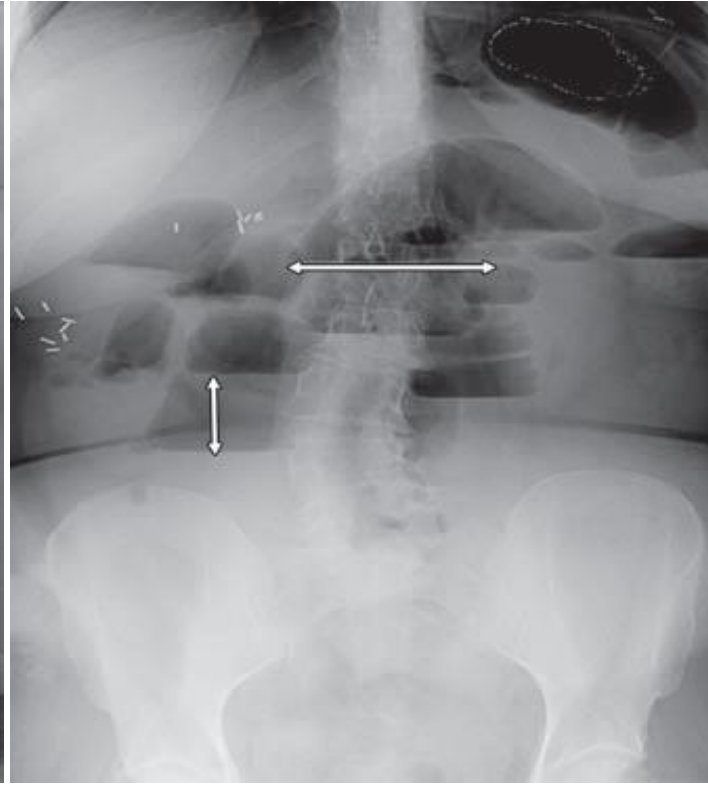
Crohn'a sekonder ileal obst.  
Dilate bağırsak segment  $>3$  cm



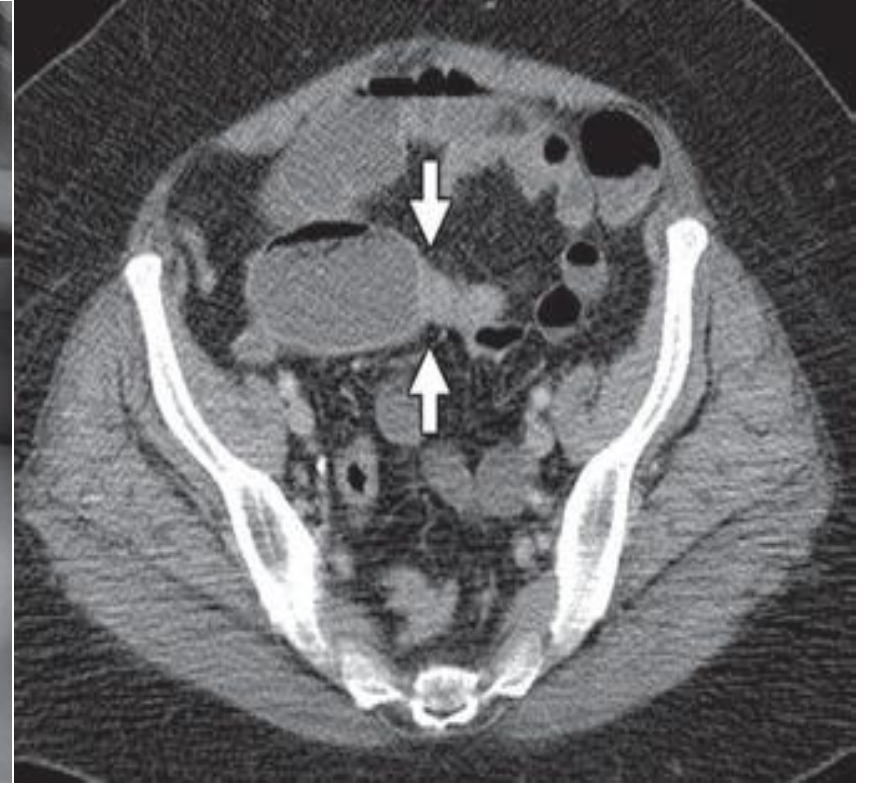
CT criteria for SBO. Axial CT. Proximal dilated bowel segment  $>3$  cm.  
Collapse distal bowel



Supine abdominal radiograph shows dilated loops of small bowel.



Erect abdominal radiograph shows small bowel dilatation with multiple air-fluid levels. Air-fluid level wider than 2.5 cm (*horizontal line*) and differential air-fluid levels within same small bowel loop (*vertical line*) are identified.



Axial CT image shows transition point in mid ileum (*arrows*), confirming mechanical obstruction due to ileal stricture.

**Mid ileumda geçiş noktası (transition point)**



February 2012, Volume 198, Number 2

Residents' Section  
Pattern of the Month

### Small Bowel Obstruction

Charles P. Mullan<sup>1</sup>, Bettina Siewert<sup>1</sup> and Ronald L. Eisenberg<sup>1</sup>

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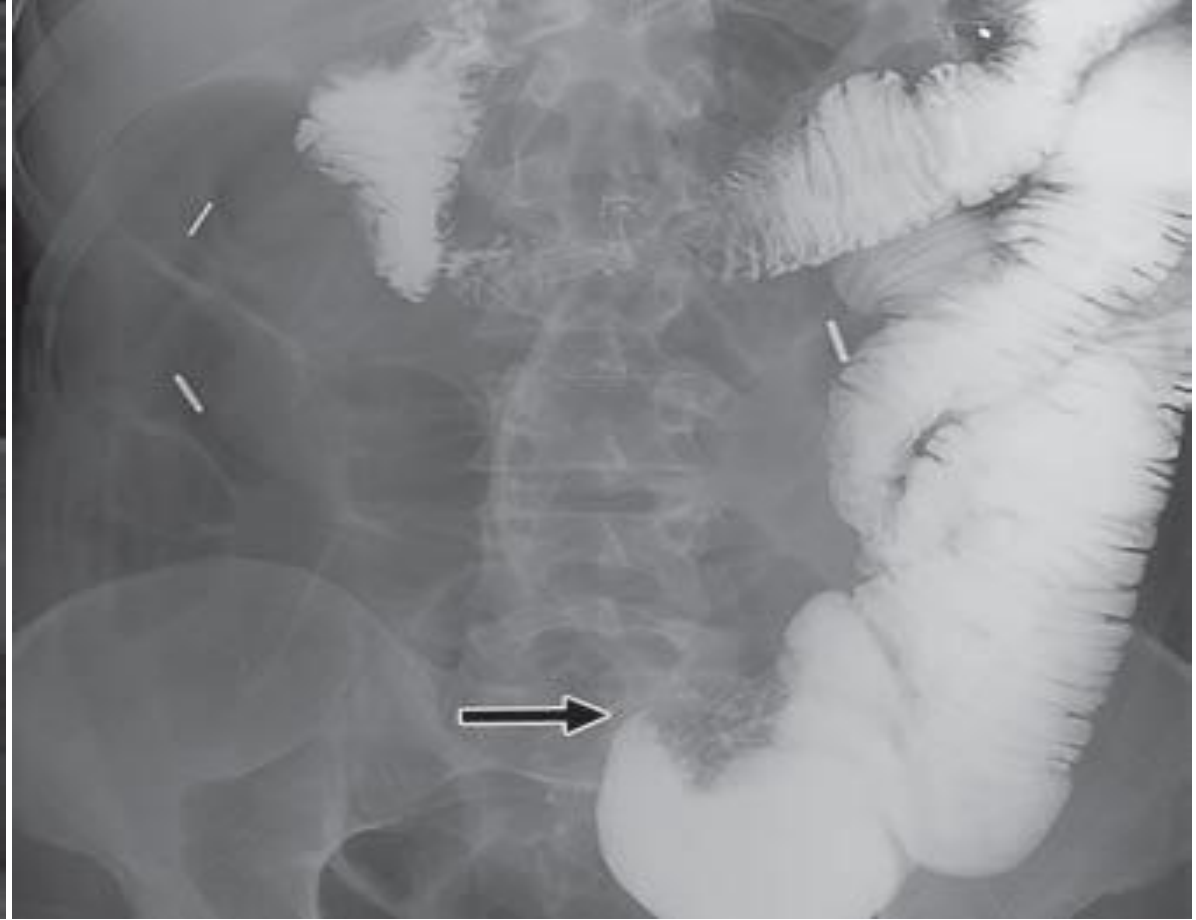
Affiliation: <sup>1</sup> All authors: Department of Radiology, Beth Israel Deaconess Medical Center, Harvard Medical School, 330 Brookline Ave, Boston, MA 02115.

Small Bowel Obstruction: Pattern of the Month. *AJR*. 2012;198:W105-W117. 10.3941/ajr.12.16999





**A**, Supine abdominal radiograph shows dilated small bowel loops throughout abdomen.



**B**, Proximal ileumda obst'dan kaynaklı gittikçe incelen opak madde geçişinin tamamen engellendiği görünüm.



February 2012, Volume 198, Number 2

Residents' Section  
Pattern of the Month

### Small Bowel Obstruction

Charles P. Mullan<sup>1</sup>, Bettina Siewert<sup>1</sup> and Ronald L. Eisenberg<sup>1</sup>

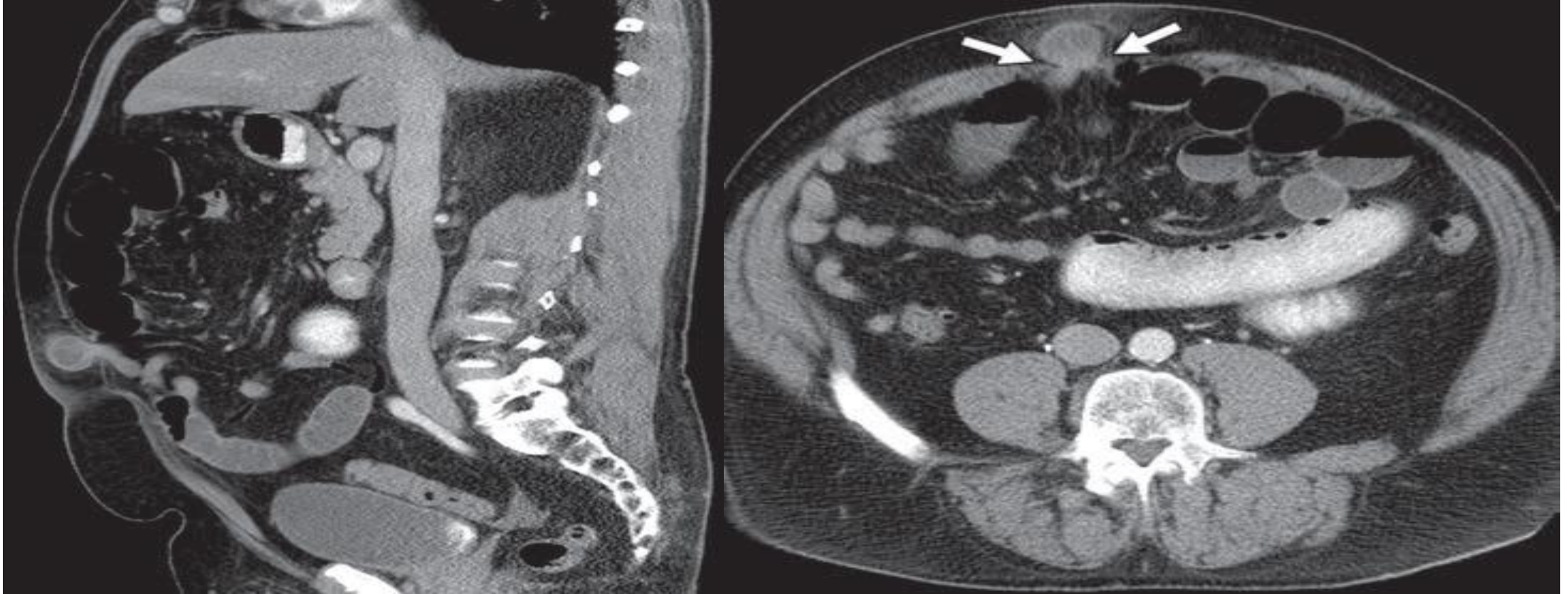
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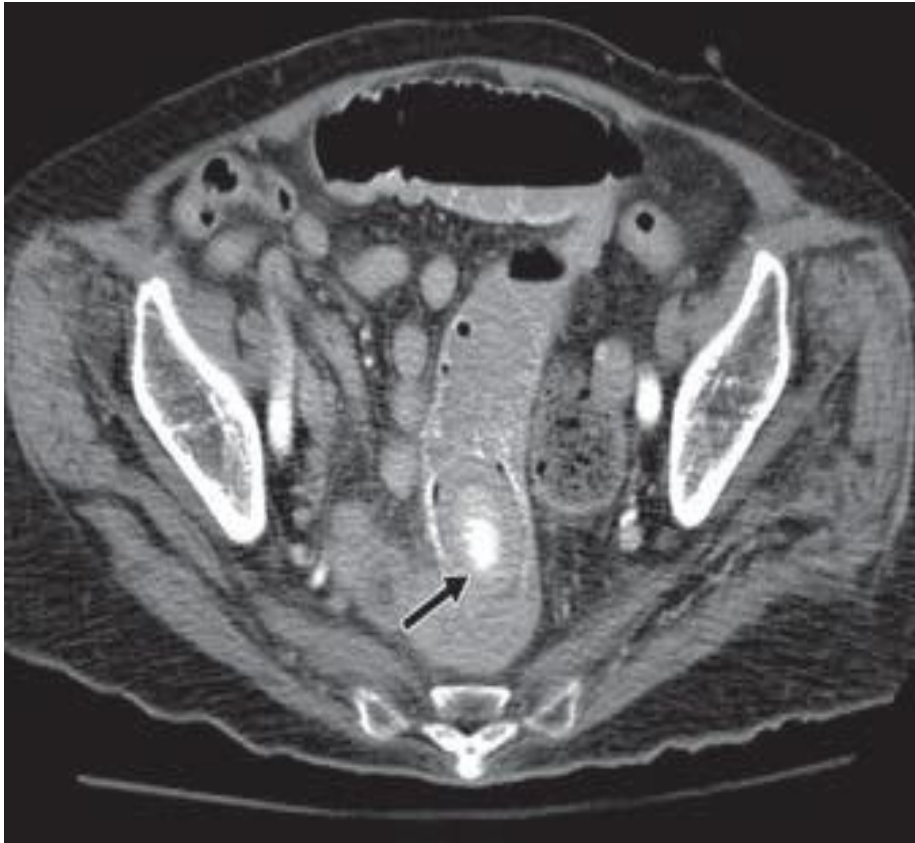
# Richter's hernia with strangulated small bowel in 54-year-old patient with no prior surgical history



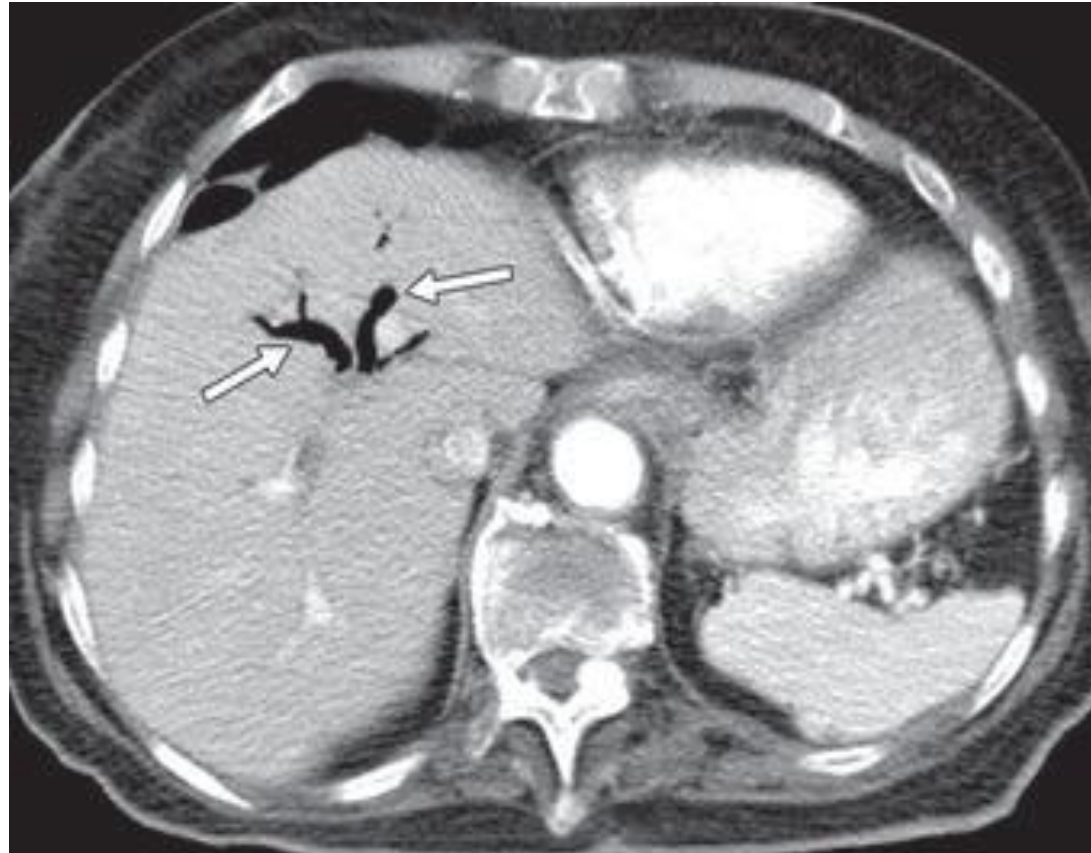
CT images show small defect in musculature of right anterior abdominal wall that developed spontaneously. Antimesenteric wall of segment of small bowel protrudes into hernial sac

Herniden kaynaklı orta derecede SBO. Herniasyon strangüle olduğu için yine de akut cerrahi müdahale gerekli.

# Gallstone ileus in elderly woman with small bowel obstruction due to gallstone ileus.



Axial CT image of pelvis shows large laminated calculus within dilated loop of distal ileum in midline (*arrow*).



Axial CT image through liver shows pneumobilia (*arrows*), consistent with biliary-enteric fistula.



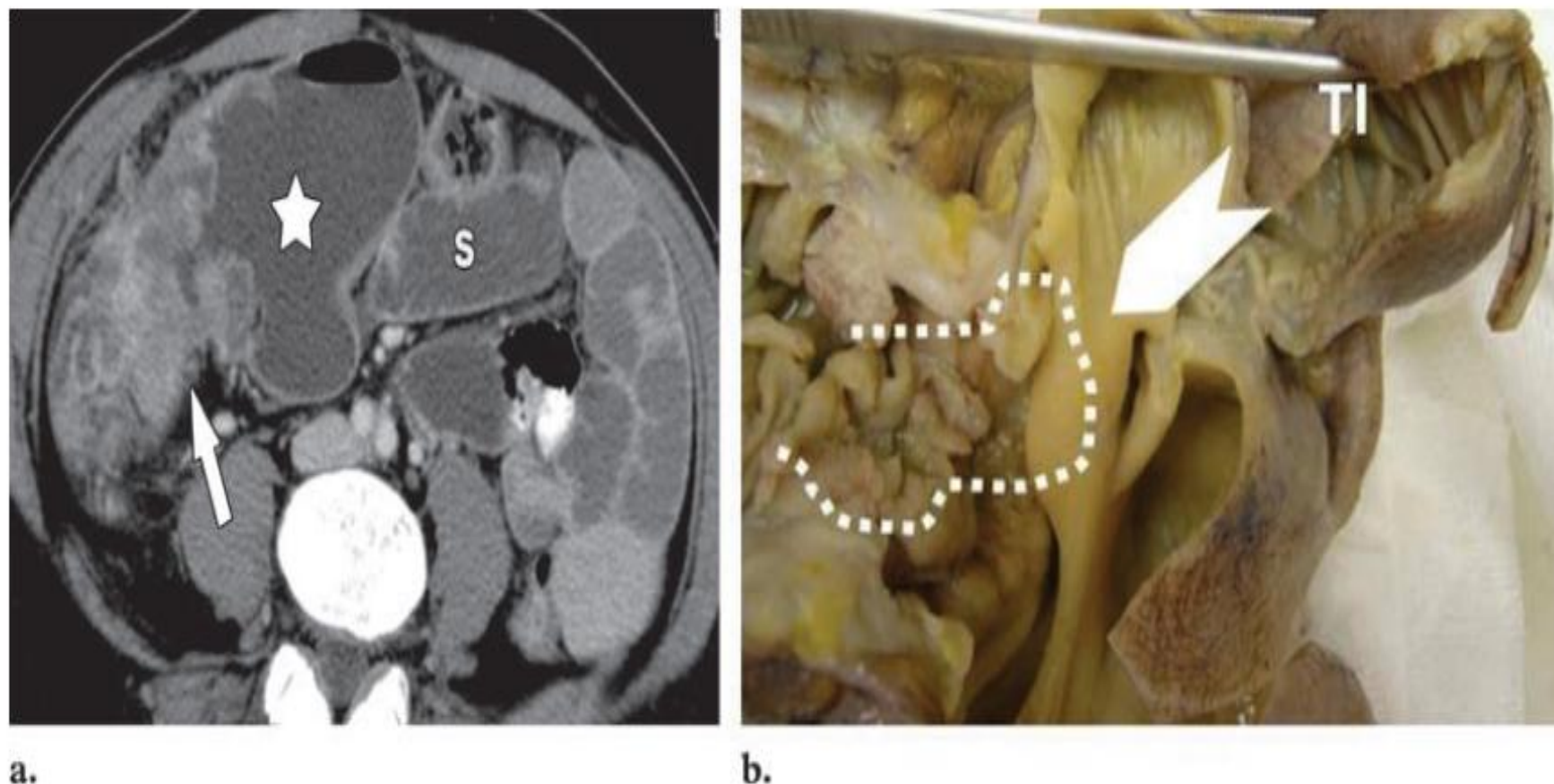


a.



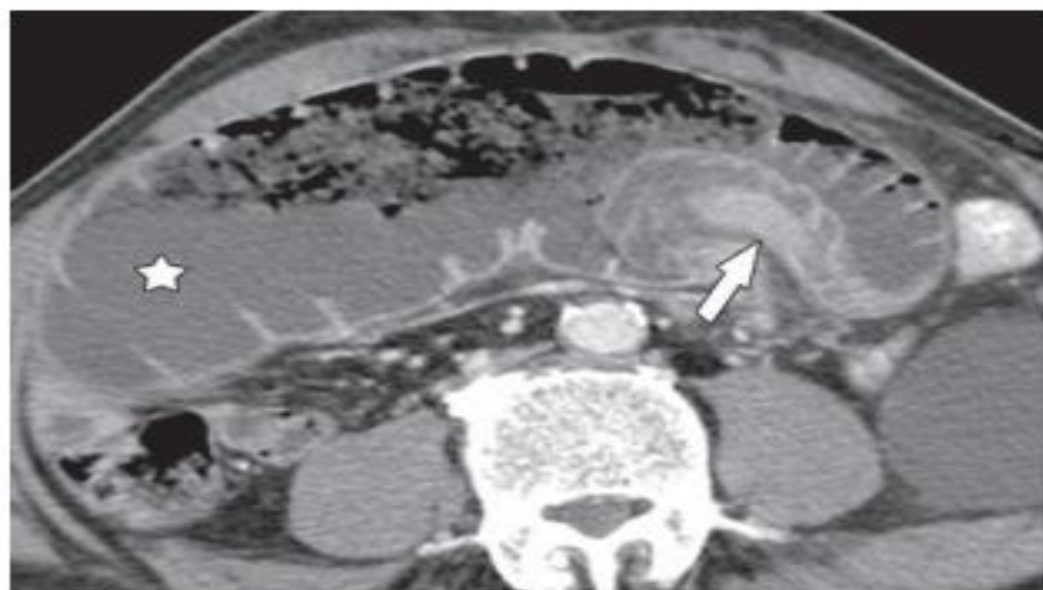
b.

**Figure 11.** SBO due to the stenotic phase of Crohn disease. **(a)** Axial CT scan shows fluid-filled dilated small bowel loops with intraluminal positive contrast material of different dilutions (\*). At the terminal ileum, a transition point with a thickened bowel wall and mural stratification (arrowheads) and perienteric hypervascularity are identified. **(b)** Photograph of the gross specimen shows the narrowed lumen of the involved segment (arrowheads) and a dilated bowel loop proximally (\*); this bowel loop corresponds to one of the bowel loops seen on the CT image (\* in a).

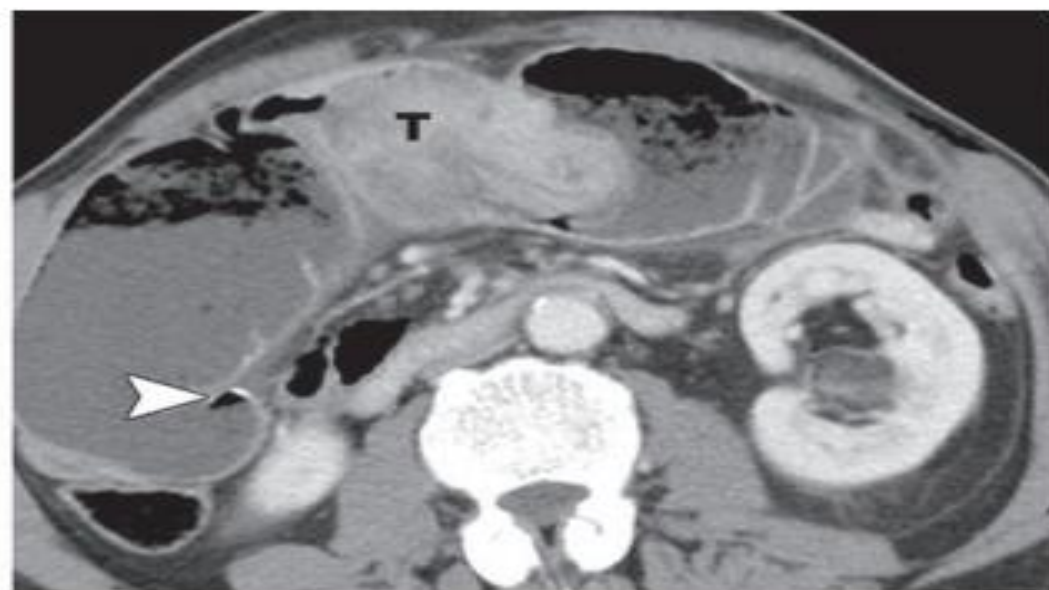


**Figure 13.** SBO secondary to adenocarcinoma of the cecum with ileocecal valve involvement. **(a)** Axial CT scan shows dilatation of small bowel loops (S) and the cecum (\*) proximal to a stenotic cancer of the cecum (arrow) that involves the terminal ileum. **(b)** Photograph of the gross specimen shows involvement of the ileocecal valve (arrow) by the neoplasm (dotted line). *TI* = terminal ileum.





a.



b.

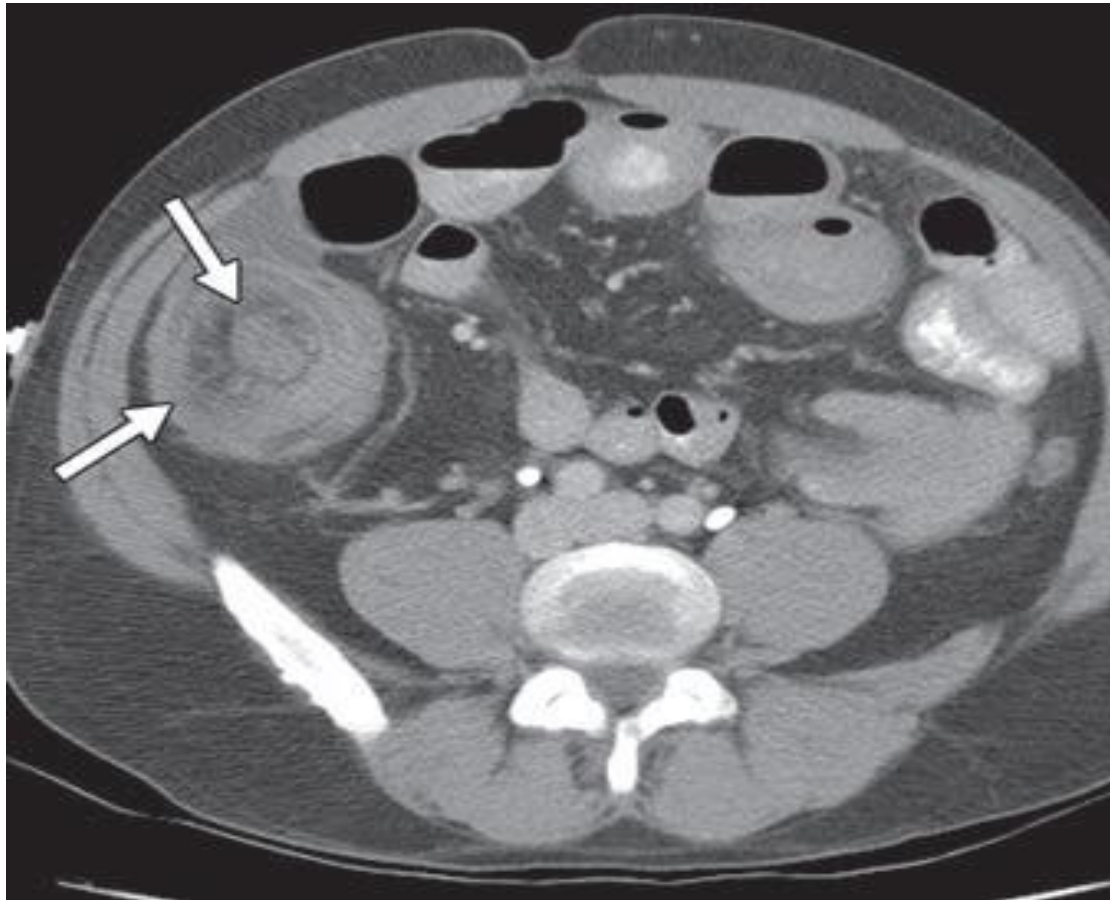


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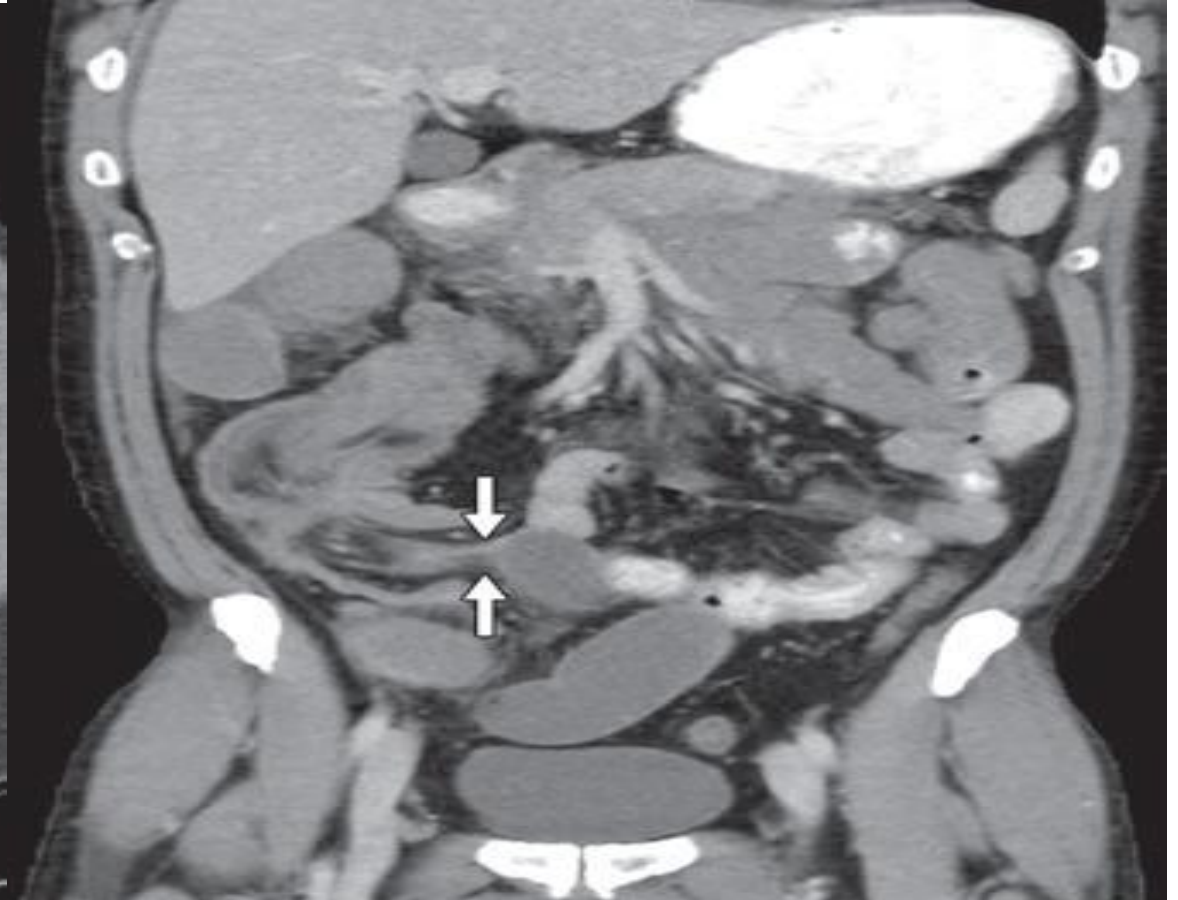
**Figure 14.** SBO caused by intussusception and an adhesive band. (a, b) Axial CT scans show the intussusceptum (arrow in a) invaginating into the intussusciens (\*) in a secondary to a submucosal tumor (T in b). The intussusciens is dilated because of an adhesion (arrowhead in b). (c) Photograph of the gross specimen shows the submucosal tumor as a large polypoid mass (arrow).

sions, or foreign bodies are associated with SBO. Transient intussusceptions are not associated with this condition.

# Intussusception in 35-year-old man with melanoma

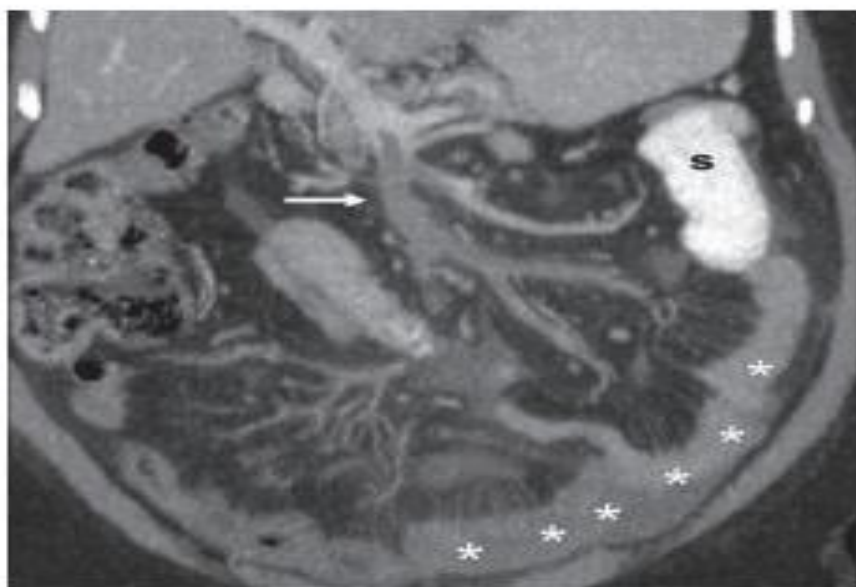


Axial CT image shows mass in right lower quadrant of abdomen with target-like appearance due to multiple adjacent bowel wall layers (*arrows*). Findings were due to ileocolic intussusception, with small bowel metastasis acting as lead point.

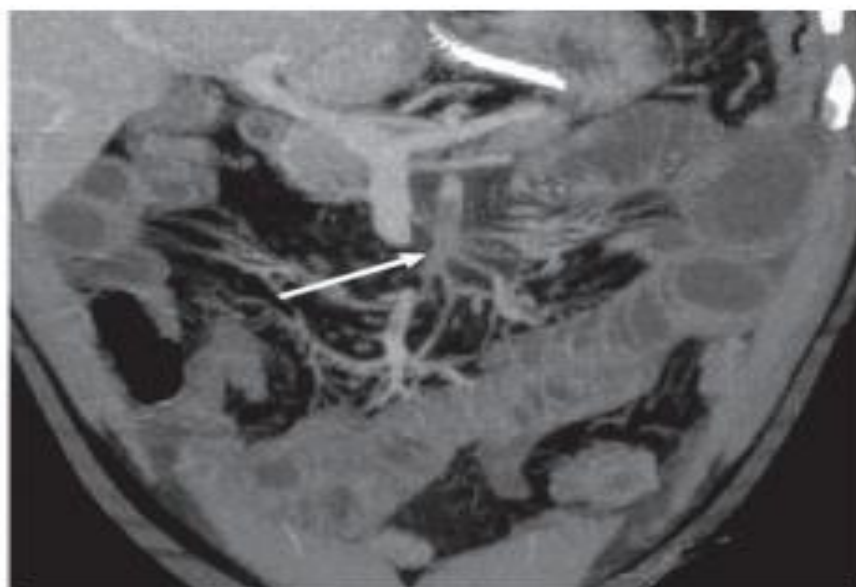


Coronal image shows intussusception in longitudinal axis. There is clear transition point between intussusception and proximal dilated small bowel (*arrows*).





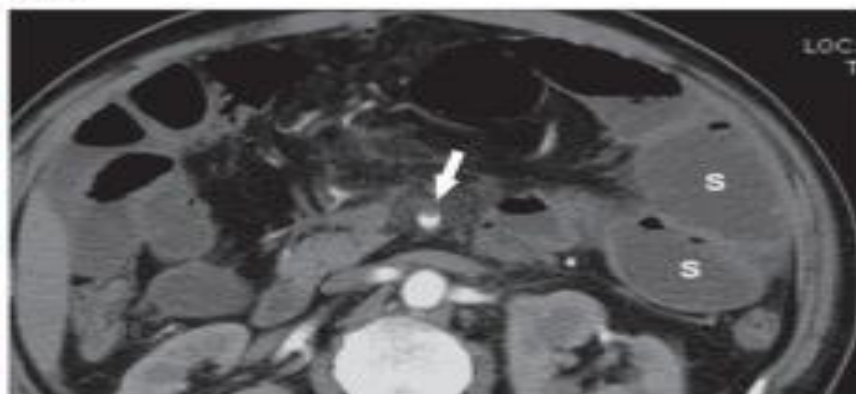
17a.



18a.



17b.



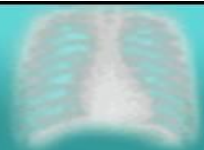
18b.

**Figures 17, 18.** (17) SBO secondary to thrombosis of the superior mesenteric vein. (a) Coronal CT scan shows thrombosis of the superior mesenteric vein (arrow) in association with circumferential wall thickening of ileal loops (\*) due to submucosal edema. S = dilated small bowel loop. (b) Photograph of the gross specimen shows an infarcted small bowel loop that has hemorrhagic mucosa with thickened valvulae. (18) SBO due to intestinal ischemia secondary to arterial occlusion. Coronal maximum intensity projection (a) and axial (b) CT scans show an endoluminal defect of the superior mesenteric artery (arrow) due to thrombosis. S in b = proximal dilated small bowel loops.



## Sentinel loop

- ◆ A localized loop of small bowel is dilated in this patient with acute pancreatitis
- ◆ This appearance is not diagnostic of intra-abdominal inflammation, but rather an occasional associated feature





# Adult Small Bowel Obstruction

Mark R. Taylor, MD, and Nadim Lalani, MD, FRCPC

**Methods:** MEDLINE, EMBASE, major emergency medicine (EM) textbooks, and the bibliographies of selected articles were scanned for studies that assessed one or more components of the history, physical examination, or diagnostic imaging modalities used for the diagnosis of SBO. The selected articles underwent a quality assessment by two of the authors using the Quality Assessment of Diagnostic Accuracy Studies 2 (QUADAS-2) tool. Data used to compile sensitivities and specificities were obtained from these studies and a meta-analysis was performed on those that examined the same historical component, physical examination technique, or diagnostic test. Separate information on the prevalence and management of SBO was used in conjunction with the meta-analysis findings of computed tomography (CT) to determine the test and treatment threshold.

**Conclusions:** The potentially useful aspects of the history and physical examination were limited to a history of abdominal surgery, constipation, and the clinical examination findings of abnormal bowel sounds and abdominal distention. CT, MRI, and US are all adequate imaging modalities to make the diagnosis of SBO. Bedside US, which can be performed by EPs, had very good diagnostic accuracy and has the potential to play a larger role in the ED diagnosis of SBO. More ED-focused research into this area will be necessary to bring about this change.

ACADEMIC EMERGENCY MEDICINE 2013; 20:528–544 © 2013 by the Society for Academic Emergency Medicine





Table 4  
Statistical Measures of Performance of X-ray for SBO Diagnosis

Study	Sensitivity, %	Specificity, %	+LR	-LR
Maglinte 1996 <sup>35</sup>	69	57	1.6	0.54
Daneshmand 1999 <sup>40</sup>	76	53	1.6	0.46
Suri 1999 <sup>22</sup>	77	50	1.5	0.47
Musoke 2003 <sup>24</sup>	86	100	∞	0.16
Jang 2011 <sup>36</sup>	46	67	1.4	0.81
Summary estimate, (95% CI)	75 (68–80)	66 (55–76)	1.6 (1.1–2.5)	0.43 (0.24–0.79)

+LR = positive likelihood ratio; -LR = negative likelihood ratio; SBO = small bowel obstruction.

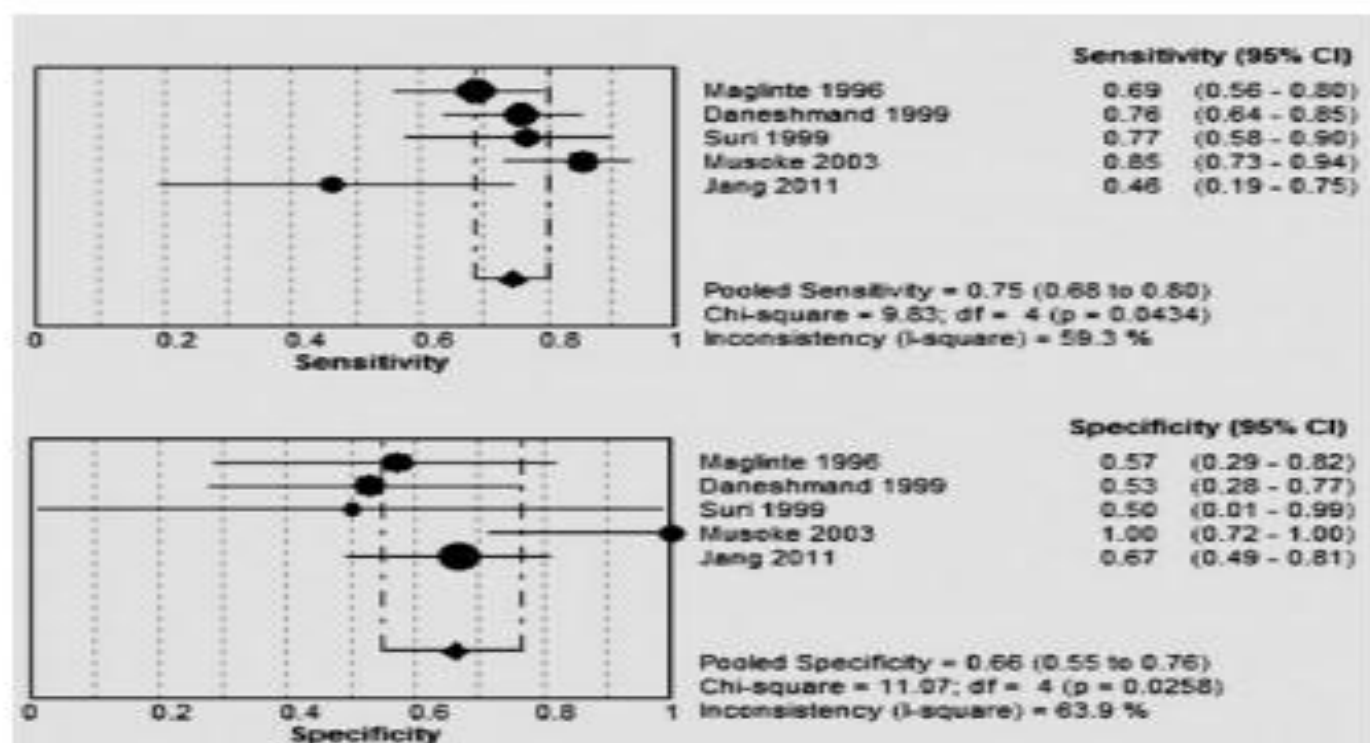
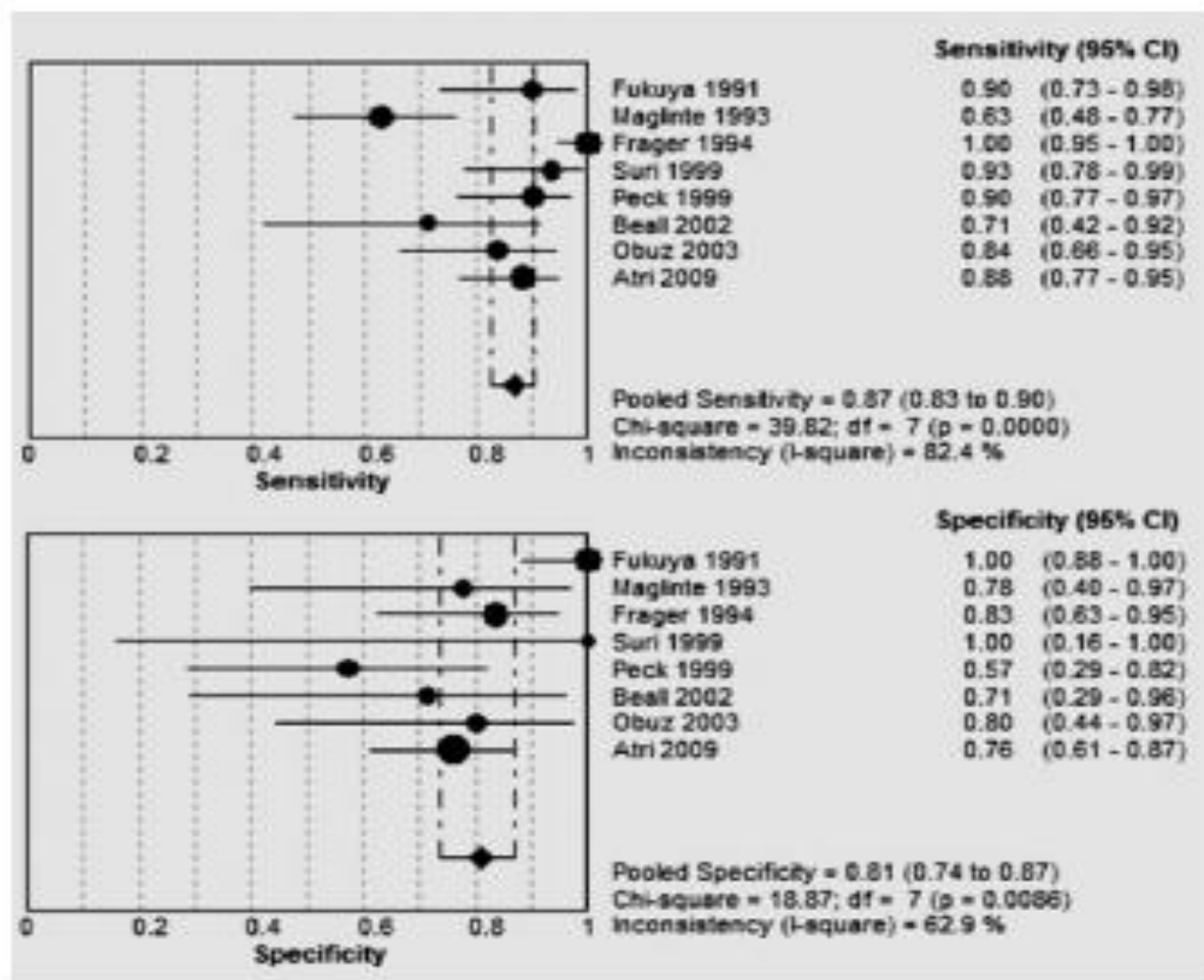
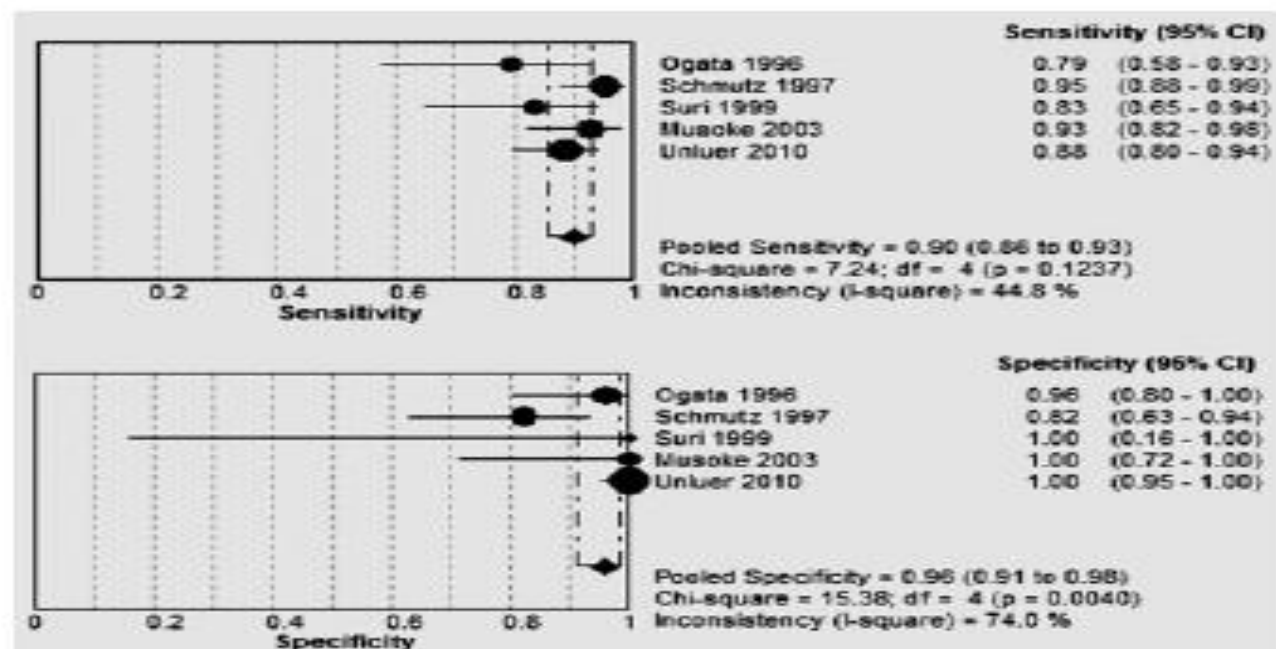


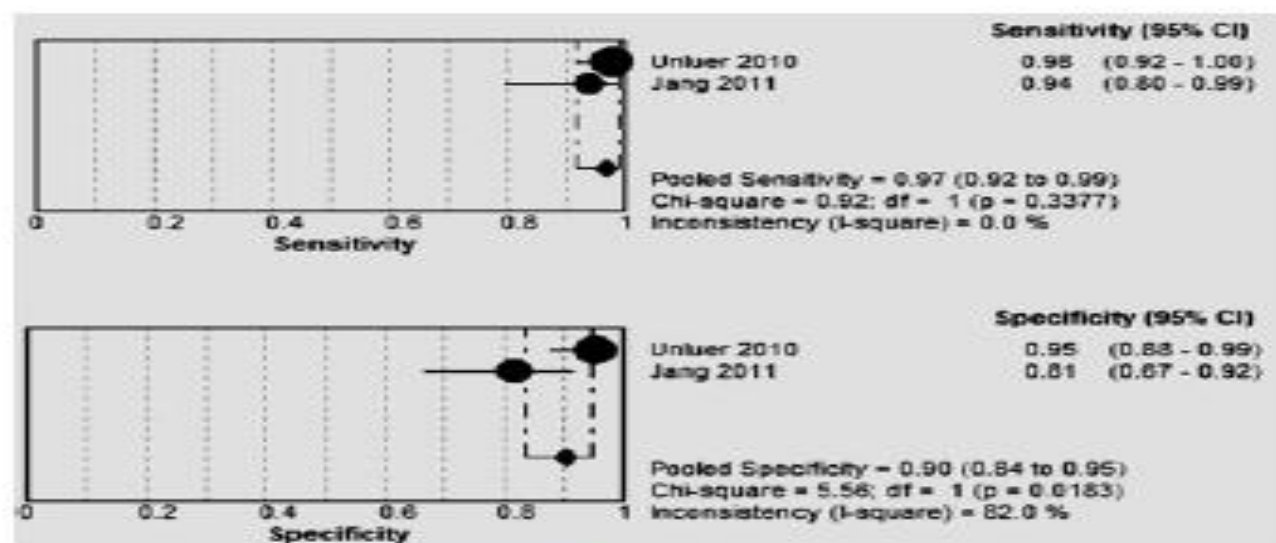
Figure 2. Meta-analysis of studies assessing x-ray performance for SBO diagnosis. SBO = small bowel obstruction.



**Figure 3.** Meta-analysis of studies assessing CT performance for SBO diagnosis (5- to 10-mm slice size). SBO = small bowel obstruction.



**Figure 5.** Meta-analysis of studies assessing **formal US** for SBO diagnosis. SBO = small bowel obstruction; US = ultrasound.



**Figure 6.** Meta-analysis of studies assessing **emergency US** for SBO diagnosis. SBO = small bowel obstruction; US = ultrasound.

# American College of Radiology ACR Appropriateness Criteria®

**Clinical Condition:** Suspected Small-Bowel Obstruction

**Variant 1:** Suspected high-grade small-bowel obstruction (SBO), based on clinical evaluation or initial radiography (if performed).

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen and pelvis with IV contrast	9	Oral contrast should not be used if high-grade SBO is known or suspected. Oral contrast will not reach the site of obstruction, wastes time, adds expense, can induce further patient discomfort, will not add to diagnostic accuracy, and can lead to complications, particularly vomiting and aspiration.	☹ ☹ ☹ ☹
CT abdomen and pelvis without IV contrast	7	Perform this procedure in patients who have known or suspected high-grade SBO when IV contrast is contraindicated.	☹ ☹ ☹ ☹
MRI abdomen and pelvis without and with IV contrast (routine)	6	MRI is most appropriate in children and younger adult patients who have had multiple prior CT examinations.	○
X-ray abdomen and pelvis	5	Perform this procedure if it has not already been performed.	☹ ☹ ☹
CT abdomen and pelvis without and with IV contrast	4		☹ ☹ ☹ ☹
MRI abdomen and pelvis without IV contrast (routine)	4	MRI is most appropriate for pregnant women, children, and younger adult patients who have had multiple prior CT examinations.	○
X-ray small bowel follow-through	4	This procedure has a limited role if a high-grade obstruction has been confirmed by radiography or CT/MRI. Perform the x-ray with water-soluble contrast material, and use iso- or low-osmolar contrast material if there is a risk of aspiration.	☹ ☹ ☹
CT enteroclysis	3	This procedure may not be readily available at most institutions or radiology practices. Generally, it is not indicated in the acute setting. This procedure has a limited role if	☹ ☹ ☹ ☹

US abdomen and pelvis

2

○

**Rating Scale:** 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate

\*Relative  
Radiation Level

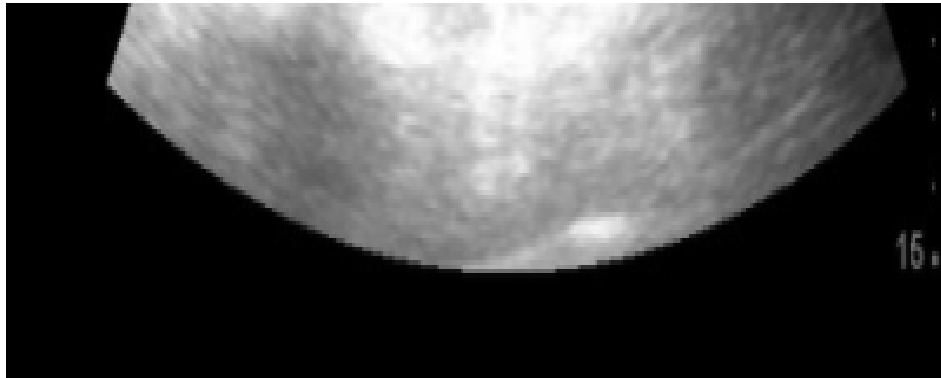
## Ultrasound

Because of CT's high accuracy for diagnosing and characterizing SBO and because of the inherent limitation of US in adults in this situation, US has rarely been used for this purpose. Compared with sonography, CT (or MRI) generally provides more information as to the status of the entire gastrointestinal tract, the 3-D anatomy, and the underlying causes and complications of SBO, and it is preferred by surgeons for adult patient management. In skilled hands, US was reported to have a nearly 90% success rate for diagnosing SBO [8,56-58], with a sensitivity of 91% and a specificity of 84%, in a prospective study of 76 patients with suspected SBO who underwent bedside US [59]. In an older study [60], CT proved superior to US in diagnosing intestinal obstructions. In the pediatric age group, US has proven useful in evaluating intussusception [52], midgut volvulus [61], and other causes of SBO [62].



## Tips and Tricks: Clinical Ultrasound for Small Bowel Obstruction – A Better Diagnostic Tool?

Alice Chao, MD and Laleh Gharahbaghian, MD, FACEP



There are some limitations to diagnosing SBO with ultrasonography. Partial SBOs may be more difficult to identify on US. Though possible, it is more challenging to identify the location of obstruction and the transition point. Finally, the specific cause of the SBO may not be adequately evaluated. Rapid identification of SBO on bedside ED US can expedite treatment such as nasogastric tube placement, which will aid in

symptomatic relief and progression of disease, as well as notifying the appropriate consultation service. US for SBO may be the most exciting new application of ultrasound coming to the bedside!



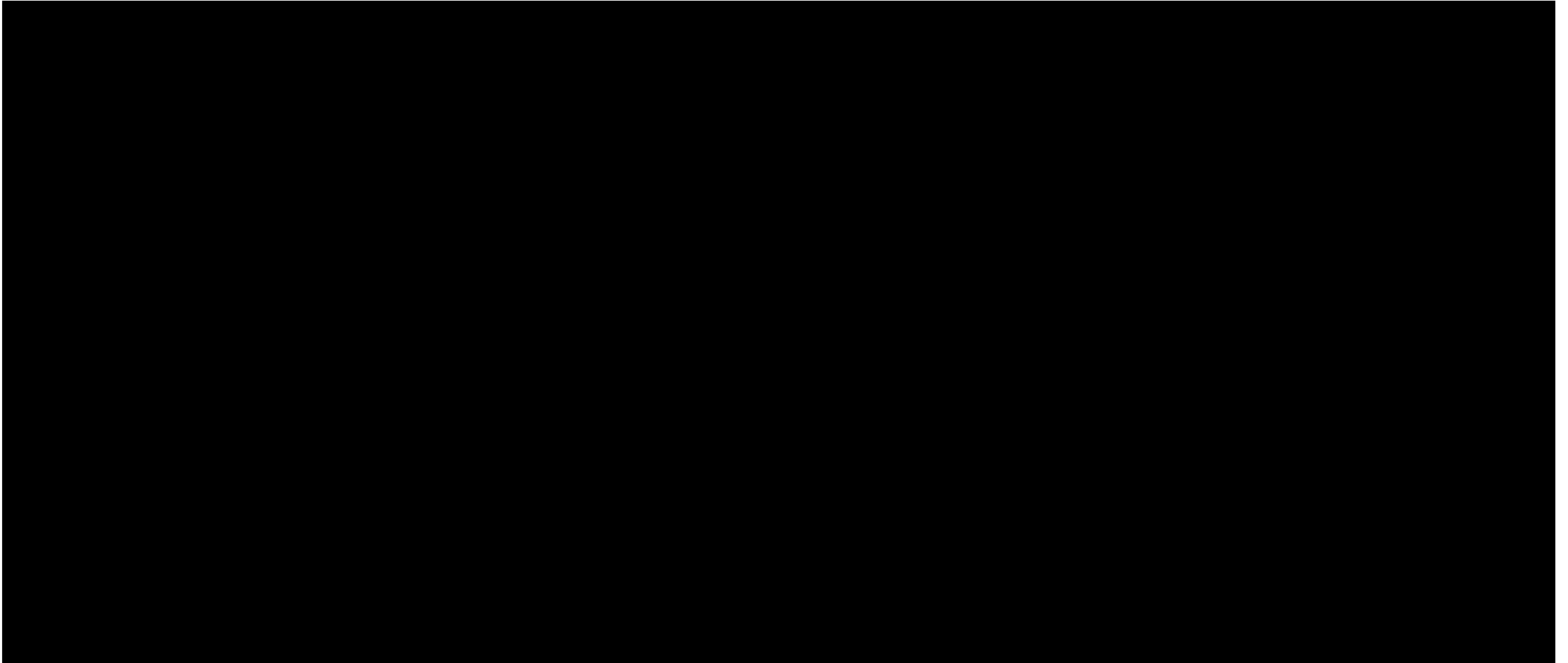
American College of  
Emergency Physicians®

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**Emergency Ultrasonography**  
*Resources and Tutorials on EM  
Ultrasound*

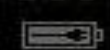




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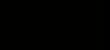
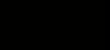
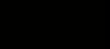
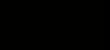
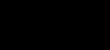
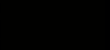
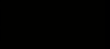
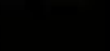
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13



8



U/L

Clips...



Dual

Page 2/2





# ALGORITHM

Patient presents with clinically suspected SBO



Bedside US

US consistent with SBO



Emergent surgical  
consultation and consider  
nasogastric tube

US equivocal



Obtain labs &  
KUB and/or CT  
abdomen/pelvis

# Özetle

- İleus=adinamik ileus=nonmekanik obstrüksiyon
- İnce bağırsak obstrüksiyonlarında;
  - İlk tercih edilecek yöntem abdominal grafi (ciddi obstrüksiyon kriterlerini belirle)
  - Ve/veya USG ile konfirme et.
  - Ciddi obstrüksiyon düşünülüyorsa kontrastlı CT (kontrast kontrendikasyonu varsa kontrastsız)
- Yatış?

