

# A Systematic Imaging Approach to Small Bowel Obstruction: A Case Series Analysis

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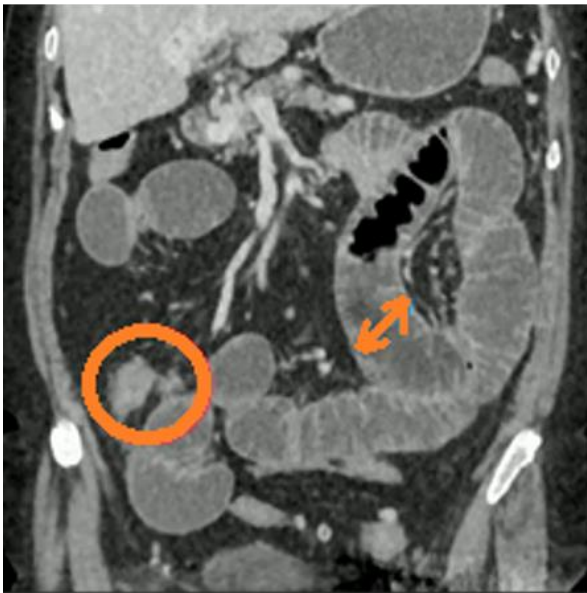
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**Abstract:** Acute small bowel obstruction is a common and critical condition encountered in emergency departments. Accurate diagnosis and timely management are essential, especially in cases complicated by bowel ischemia. This case series evaluates ten patients diagnosed with SBO over last two years, using a systematic approach with CT imaging. The study emphasizes the utility of diagnostic algorithms in confirming obstruction, identifying the transition zone and predicting clinical outcomes. Detailed imaging protocols and specific signs, such as the small bowel feces sign and the beak sign, are explored to aid in surgical decision making and improving patient outcomes.

**Keywords:** small bowel obstruction, CT imaging, diagnostic algorithm, bowel ischemia, transition zone

## 1. Cases



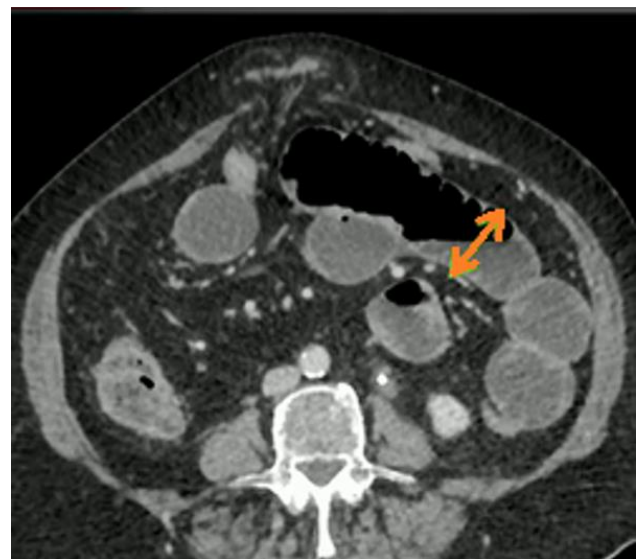
Confirming the obstruction – Most dilated small bowel loop diameter, > 25 mm. (> 40 mm contraindication to laparoscopy risk of perforation.)

Assess if its mechanical or functional ileus.

Criteria: Bowel loop > 25 mm: Collapsed colon and terminal ileum.



Post operative functional ileus. (Terminal ileum collapse but colon is not collapsed)



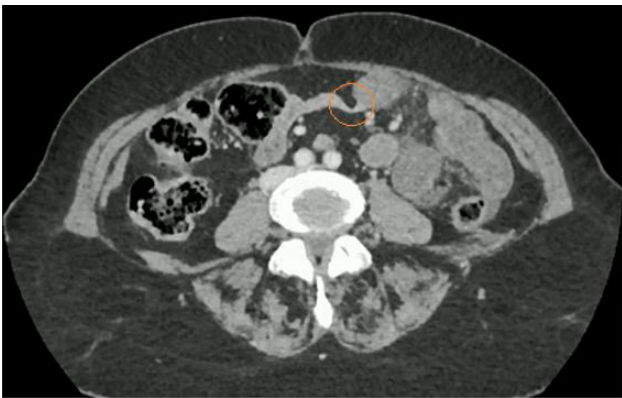
Small bowel spasm due to colon cancer causing mechanical colonic obstruction (Dilated terminal ileum, colon)

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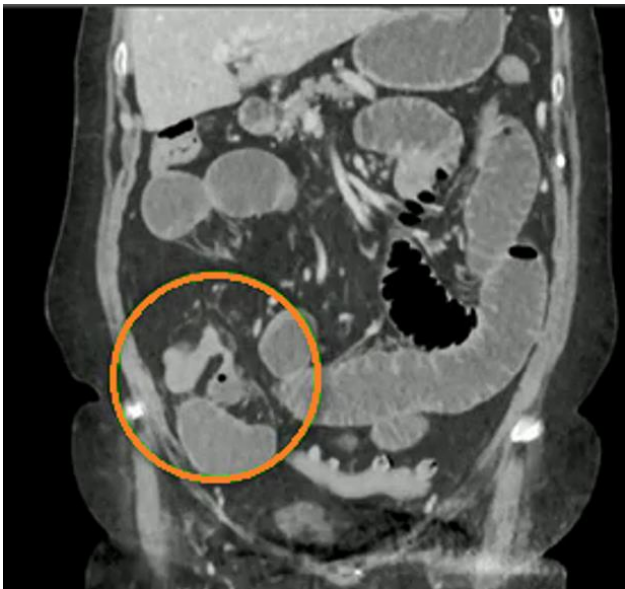
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Finding transition zone between dilated upstream loops and collapsed downstream loops by following dilated loops, cine modes, coronal view and feces sign.



SMV narrowing at the level of transition zone.



Right iliac fossa adhesive band.

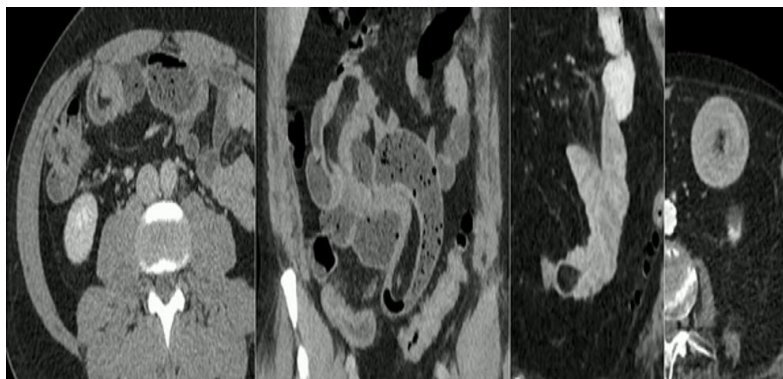


Strangulated femoral hernia.



Transition Zone – Feces Sign

Feces sign: particulate, matter mixed with gas bubbles in a dilated loop



**Intussusception with lipoma as lead point**

Final step is looking for bowel ischemia. Simple obstruction may not cause obstruction and managed conservatively, whereas closed loop obstruction cause bowel ischaemia while lab findings maybe normal. Closed loop obstruction diagnosed by identifying odd group of bowel, mesenteric edema and two points of obstruction.

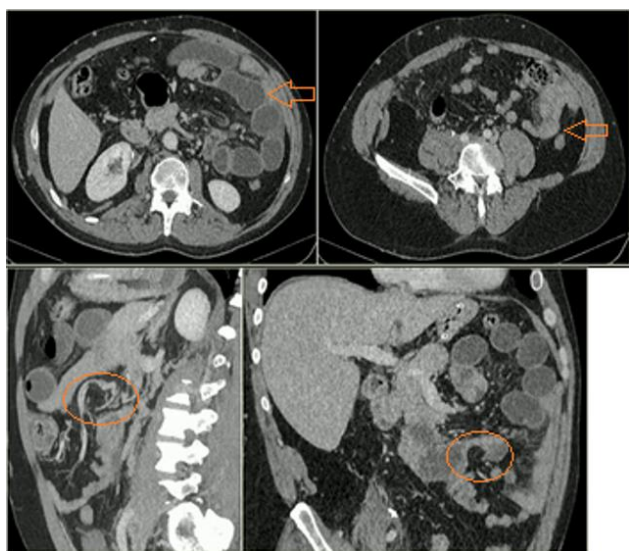
**2. Conclusion**

The above cases illustrate systematic approach in the management of bowel obstruction.

Mechanical obstruction is first confirmed by collapsed terminal ileal loop and right colon plus a transition zone between upstream dilated and downstream collapsed loops. small bowel feces sign is helpful in locating transition zone.

Next, identify the cause of small bowel obstruction and identify signs to predict clinical outcomes.

Finally, distinguish bowel ischemia by looking for signs of closed loop obstruction



No feces sign, dilated upstream & collapsed downstream loop, whirl sign & fat notch and beak sign  
= High Grade SBO = Nonsurgical treatment failure

**Predicting clinical outcome of nonsurgical treatment - <2 beak signs, anterior parietal adhesion & Small bowel feces sign has good success rate. While high grade SBO, transition zone, abnormal vascular course, mesenteric fat stranding & intraperitoneal fluid has high failure rates**

**References**

- [1] Ten Broek RP, Issa Y, van Santbrink EJ, Bouvy ND, Kruitwagen RF, Jeekel J, et al. Burden of adhesions in abdominal and pelvic surgery: systematic review and met - analysis. BMJ.2013; 347: f5588.
- [2] Nicolaou S, Kai B, Ho S, Su J, Ahamed K. Imaging of acute small - bowel obstruction. AJR Am J Roentgenol 2005; 185 (4): 1036–1044.
- [3] MaglinteDD, Howard TJ, Lillemoe KD, Sandrasegaran K, Rex DK. Small - bowel obstruction: state - of - the - art imaging and its role in clinical management. Clin Gastroenterol Hepatol2008; 6 (2): 130–139.
- [4] Adhesive Small - Bowel Obstruction: Value of CT in Identifying Findings Associated with the Effectiveness of Nonsurgical Treatment Ingrid Millet et al, Radiology 2014 273: 2, 425 - 432.
- [5] The Small - Bowel Feces Sign. Michael H. Fuchsjäger; Radiology 2002 225: 2, 378 - 379
- [6] Review of Small - Bowel Obstruction: The Diagnosis and When to Worry. Erik K. Paulson and William M. Thompson. Radiology 2015 275: 2, 332 - 342
- [7] Small Bowel Obstruction, Charles P. Mullan, AJR.2012; 198: W105 - W117.10.2214/AJR.10.4998

SBO causes with bowel wall thickening at transition zone	
Single Transition zone	Extrinsic (adhesion hernias, endometriosis, perit carcinomatosis), Intrinsic (Ischemis hematoma, Infection, IBD, RT, Intussusception, Neoplasia), Intraluminal (Gallstone ileus, Bezoar, foreign bodies)
>1 transition zone	Closed loop, obstruction, Volvulus, Internal hernia