

Small bowel obstruction by CT scan

Emhmed Mohamed Saaid¹ and Emraga abohamod²

Department of Diagnostic Radiology, Sebha Medical Center Hospital and Department of Anatomy, Faculty of Medicine, University of Sebha, Sebha, Libya

Introduction

Computed tomography (CT) is an effective tool in evaluation of small bowel obstruction. Small bowel obstruction is common cause of abdominal emergency. Diagnosis helps effective management and prevent complication. The small bowel faces sign is a finding observed in small bowel

Case report

Small bowel obstruction is common cause of acute abdomen. It accounts to 4% of patient with acute abdomen (1). Clinical signs and symptoms are not always diagnostic. Identifying the cause of obstruction is important for early management. Many other clinical condition like a dynamic ileus, intra-abdominal abscess and gastroenteritis present with same clinical presentation. CT scan of abdomen has shown to be effective in diagnosing small bowel obstruction (2), with high degree of sensitivity. It can provide information about specific cause and site of obstruction. The role of CT in diagnosis of small bowel obstruction is to identify small bowel dilatation and transition point. The degree of obstruction can be mild, moderate and high grade depending on caliber difference between the dilated and non-dilated segment of bowel. High grade obstruction is greater than 50% difference in

obstruction on helical CT scan. It's defined as presence of feces like material in the lumen of dilated loops of small bowel proximal to the site of obstruction this section will illustrate the small bowel faces sign with examples.

caliber of proximal dilated small bowel and collapsed distal small bowel, CT in addition to confirming the diagnosis of obstruction is also useful in determining the degree and cause of obstruction and also the complications that require immediate surgery (e.g. closed loop obstruction or bowel ischemia) (3).

Adhesion are most cause of small bowel obstruction accounting for 60-80% of all the cases (4). The other causes include external hernias, inflammatory strictures and tumors. Identifying the transition point (transition point is the zone where the dilated loop abruptly change in caliber to normal / non dilated bowel) helps in evaluating the cause of obstruction and initiate appropriate treatment. Although the identification of transition zone of obstruction is easy in case of external hernias or tumor, it's difficult to visualize in cases of adhesions.

On CT, the usual way is to trace the bowel to the point of transition, however is not always easy on the axial image. It require either scrolling through the images back and forth or require multi-planar reformats to identify zone of transition and the underlying cause. Small bowel faces sign is a useful CT sign that helps identifying the transition zone. It's defined as presence of faces like material mixed with gas bubbles in the lumen of dilated loops of small bowel proximal to the site of obstruction. The sign tend to be most prominent at the site of transition from the dilated to collapsed portion of small bowel. It's likely caused by stasis of obstructed loop allowing more time to fluid absorption from the bowel and accumulation of undigested food particles. This sign is seen in mechanical small bowel obstruction due to adhesions, hernias, tumors and inflammatory stenosis. Mottled material with air collections within the small bowel may also been seen in the other conditions such as infections or metabolic bowel disease (5). However by definition the small bowel faces sign is

presence of feculent material with dilatation of proximal bowel and signs of obstruction. Sometime feculent material is seen as normal finding in non-dilated distal ileal loops which usually result from reflux of focal material from the cecum secondary to an incompetent ilio-cecal valve. The faces sign may be seen in the high percentage of patients with small bowel obstruction. In one of the series it was reported in as many as 82% of the sample population with mechanical small bowel obstruction (6).

In summary the small bowel obstruction is a common clinical problem. Identifying the zone of transition helps in determining the underlying cause and there by guiding appropriate treatment. The identification of small bowel faces sign on CT is important because this sign is usually seen at zone of transition, thus facilitating identification of the site and many times leading to the cause of obstruction. The CT appearance and knowledge of this sign is of value and helps the radiologist in the diagnosis of small bowel obstruction.

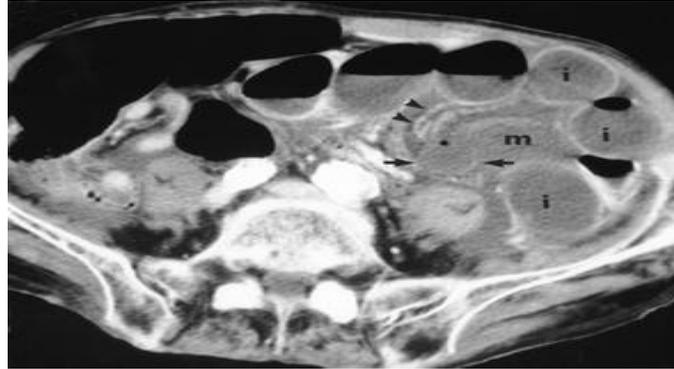


Figure 1:85-year-old woman with reversible ischemia. Contrast-enhanced CT scan shows signs of mechanical obstruction of small bowel with dilated and fluid-filled loops in left fossa iliaca (i). Note fluid in mesentery (m) and congestion of small mesenteric veins (*arrowheads*). Wall of segment of small bowel is barely visible (*arrows*). Small gas bubble is present in unenhanced loop.

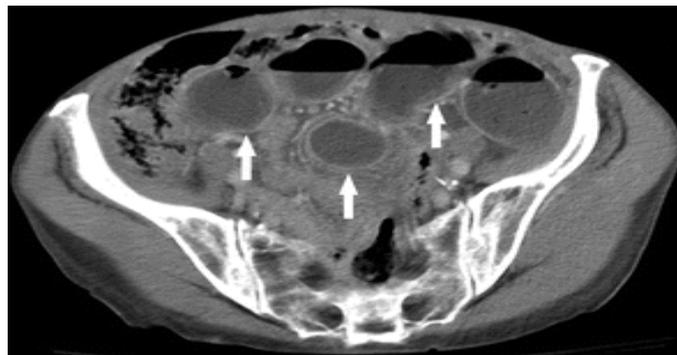


Figure 2:Small-bowel obstruction secondary to adhesions. Axial CT scan through lower abdomen in 54-year-old woman with small-bowel obstruction secondary to adhesions shows multiple fluid-filled loops of small bowel (*arrows*).

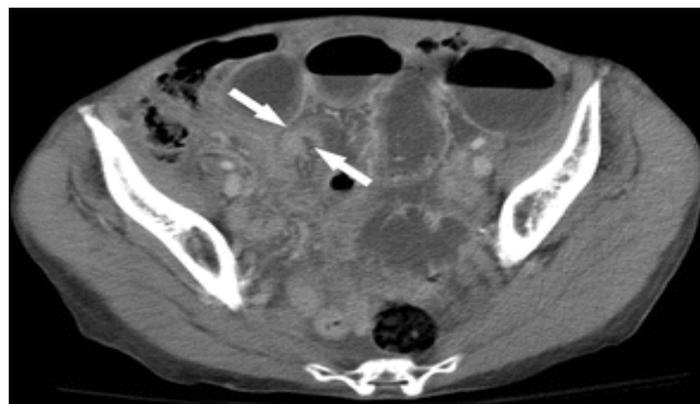


Figure 3:Small-bowel obstruction secondary to adhesions. CT scan obtained shows transition point (*arrows*) with dilated bowel proximally and collapsed bowel distally. No pathologic process is visualized at transition point, and transition is smooth. This obstruction was found to be adhesion in nature.

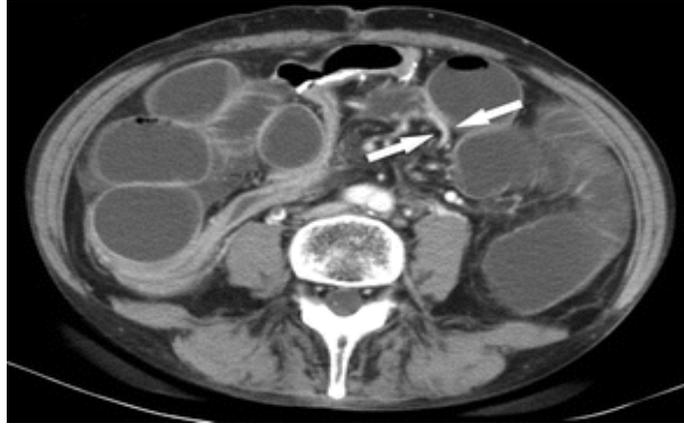


Figure 4: Small-bowel obstruction secondary to adhesions. Axial contrast-enhanced CT scan through mid abdomen of 55-year-old man with small-bowel obstruction secondary to adhesions shows multiple fluid-filled loops with tapering transition point (*arrows*), otherwise known as beak sign.



Figure 5: Small-bowel obstruction secondary to Crohn's disease. Axial CT scan through lower abdomen in 28-year-old woman with Crohn's disease shows partially solid material intermixed with air within distal small bowel (*arrows*), similar in appearance to feces in colon; this finding is called the "small-bowel feces" sign.

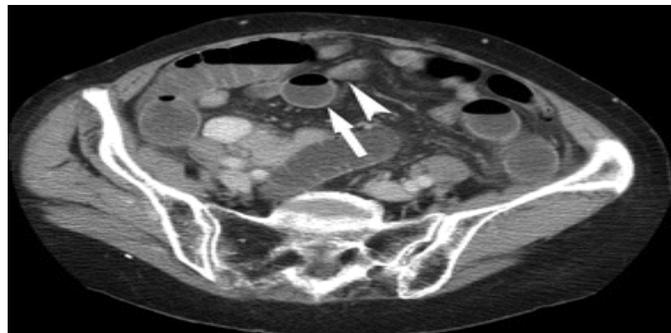


Figure 6: 58-year-old woman with small-bowel obstruction secondary to adhesions. Axial CT scan through lower abdomen shows dilated proximal loop (*arrow*) and collapsed distal loop (*arrowhead*).

References

1. Dedombal FT. Diagnosis of acute abdominal pain, 2nd ed. New York.NY.Churchill living stone. 1991.
2. Megibow AJ, Balthazar EJ, Kyunghee, CC, medwid SW, Bimbaum BA, Noz Me, bowel obstruction: evaluation with CT radiology 1991; 180: 313-318.
3. Balthazar EJ, Liebskind ME Macari M, Intestinal ischemia in patient in whom small bowel obstruction is suspected, evaluation of accuracy limitations and clinical implication of CT in diagnosis, Radiology 1997, 205:519-522.
4. Balthazar EJ CT of small bowel obstruction AJR 1994;162:356-375.
5. Quiroga S, Alverze-castells A Sebastia C, Pallisa E. Small bowel obstruction secondary to Bezoar , CT diagnosis, Abdomen imaging 1997; 22:315-317.
6. Mayo-Smith WW, Withinberg J, bennett GL, Gervais DA, Gazelle GS, Mueller PR ,the CT small bowel faces signs, description and clinical significant, clinic Radiol. 1995; 50:765-767.