ejpmr, 2019,6(12), 157-159

SJIF Impact Factor 6.222

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Review Article

ISSN 2394-3211

EJPMR

CT SCAN VALUE IN ESTABLISHING THE DIAGNOSIS OF SMALL BOWEL OBSTRUCTION

[1]Dr. Emhmed Mohamed Saaid and [2]*Dr. Emraga Abohamod

[1]Department of Diagnostic Radiology, Sabha Medical Centre Hospital, Sabha University College of Medicine, Sabha-Libya.

[2]Department of Anatomy, Sabha University College of Medicine, Sabha-Libya.

***Corresponding Author: Dr. Emraga Abohamod**

Department of Anatomy, Sabha University College of Medicine, Sabha-Libya.

Article Received on 04/10/2019 **Article Revised on 24/10/2019** **Article Accepted on 14/11/2019**

INTRODUCTION

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 faeces sign is a finding observed in small bowel obstruction on helical CT scan. Its defined as presence of faeces 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.

Epidemiology and Clinical Correlation

Small bowel obstruction is common cause of acute abdomen. it account approximately 4% of patient with acute abdomen.[1] Clinical signs and symptoms are not always diagnostic and identifying the cause of obstruction is important for early management. Many other clinical condition like adynamic (paralytic) ileus, intraabdominal abscess and gastroenteritis present with similar clinical presentation.

Small Bowel Obstruction Aetiology

CT in addition to confirming the diagnosis of obstruction as well as its, it can help to elicit the cause of obstruction and any associated 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 neoplasms, as the CT scan is well known to be a good modality in malignant lesions diagnosis.[5]

CT Scan findings in small bowel obstruction

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 (Fig.1). The degree of obstruction could be mild, moderate or high grade depending on caliber difference between the dilated and non dilated segment of bowel. High grade obstruction is greater than 50% difference in caliber of proximal dilated small bowel and collapsed distal small bowel.

Identifying the transition point (transition point is the zone where the dilated loop abruptly change in caliber to normal / collapsed bowel) helps in evaluating the anatomical site of the obstruction and cause of obstruction. This will allow the clinician to plan initiate the appropriate management. Although the identification of transition zone of obstruction is easy in case of external hernias or tumor, its difficult to visualize in cases of intra-abdominal adhesions (Fig.2,3,4,5).

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 requires either scrolling through the images back and forth or requires multi-planar reformats to identify zone of transition and the underlying cause.

Small bowel faeces sign is a useful CT sign that helps identifying the transition zone. It is defined as presence of faeces 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. Its likely caused by stasis of obstructed loop allowing more time to fluid to be absorbed from the bowel and accumulation of undigested food particles. This sign is seen in mechanical small bowel obstruction due to adhesions, hernias, tumours and inflammatory strictures (Fig.6). Mottled material with air collections within the small bowel may also been seen in the other conditions such as infections or metabolic bowel disease.[6] However by definition the small bowel faeces sign is presence of feculent material with dilatation of proximal bowel in addition to clinical signs of obstruction. The faeces sign is reported to be seen in the high percentage of patients with small bowel obstruction.

Mayo-Smith et al, in 1995 published a paper which revealed that, as many as 82% of patients with mechanical small bowel obstruction, has shown faeces sing in the CT of the sample.[7]

Sometimes feculent material is seen as normal finding in non dilated distal ileal loops which usually result from reflux of faecal material from the cecum secondary to an incompetent ilio-cecal valve.

Fig. 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.

Fig. 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*).

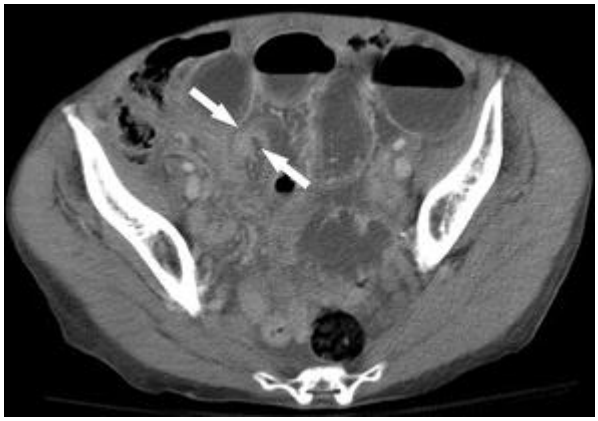

Fig. 3: Small-bowel obstruction secondary to adhesions. CT scan obtained shows transition point (*arrows*) with dilated bowel proximally and collapsed bowel distally. No pathologic process is visualized at transition point, and transition is smooth. This obstruction was found to be adhesional in nature.

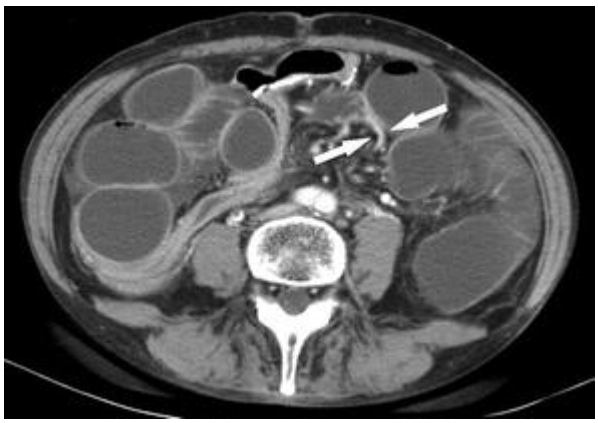

Fig. 4: Small-bowel obstruction secondary to adhesions. Axial contrast-enhanced CT scan through mid abdomen of 55-year-old man with small-bowel obstruction secondary to adhesions shows multiple fluid-filled loops with tapering transition point (*arrows*), otherwise known as beak sign.

Fig. 5: 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*).

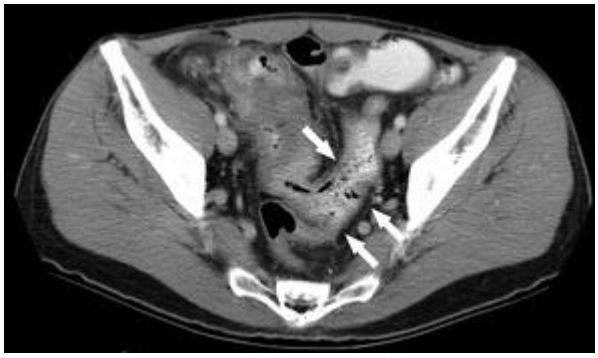

Fig. 6: Small-bowel obstruction secondary to Crohn's disease. Axial CT scan through lower abdomen in 28-year-old woman with Crohn's disease shows partially solid material intermixed with air within distal small bowel (*arrows*), similar in appearance to feces in colon; this finding is called the "small-bowel faeces" sign.

CONCLUSION

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 the clinician to commence appropriate treatment. The identification of small bowel faeces sign on CT is important because this sign is usually seen at zone of transition, thus facilitating identification of the anatomical site and many times leading to know 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.

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