Imaging of Gallstone Ileus

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Abstract

Gallstone ileus is a rare complication of chronic cholecystitis with gallstone associated with high mortality rate (about 8-30%). It occurs when a stone passes into the small bowel and characterized by partial or complete small bowel obstruction. Gallstone ileus usually occurs in the elderly patient with a female predominance. The imaging diagnosis can be confirmed by plain abdominal radiography, ultrasound and CT scan which demonstrate Rigler's triad: intestinal obstruction, pneumobilia and ectopic gallstone. We report imaging findings of a case of gall stone ileus. A 77 years old man presented with right lower quadrant pain and fever for 2 days. Physical examination showed fever (temperature 38.5° C), mark tender at right lower abdomen with voluntary guarding. Plain abdomen radiograph showed partial small bowel obstruction. The initial diagnosis was acute appendicitis. Ultrasound findings were generalized bowel dilatation and well-defined laminated hyperechoic lesion size about 2.4x2.9 cm. in distal small bowel which suspect stone. CT scan was performed which demonstrate generalized small bowel dilatation and visible large laminated calcific lesion at terminal ileum. Operative findings were shown gallstone size about 2x 2 cm. at terminal ileum, small pore at duodenum and gallbladder , adhesion at 1st part of duodenum. Surgical treatment was explored with enterotomy, cholecystectomy, repaired duodenum with omental patch, hepatoduocojejunostomy and jejunojejunostomy with bowel loop.

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บทคัดย่อ: Imaging of Gallstone Ileus: รายงานผู้ป่วย 1 ราย

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Gallstone ileus เป็นภาวะแทรกซ้อนที่พบได้น้อยของผู้ป่วยถุงน้ำดีอักเสบเรื้อรังที่มีนิ่วในถุงน้ำดี มีอัตราความเสี่ยงต่อการเสียชีวิตค่อนข้างสูง (ประมาณ 8-30%) เกิดเมื่อมีการหลุดของนิ่วไปอยู่ในลำไส้เล็ก เกิดภาวะอุดตันของลำไส้เล็ก ปกติมักพบในผู้หญิงมากกว่าผู้ชาย และมักพบในคนสูงอายุ การวินิจฉัยจะอาศัยจากภาพเอกซเรย์ช่องท้อง, การทำอัลตราซาวด์และเอกซเรย์คอมพิวเตอร์ ซึ่งจะพบ Rigler's triad คือ intestinal obstruction, pneumobilia และ ectopic gallstone รายงานนี้เป็นผู้ป่วยชายไทย อายุ 77 ปี มาด้วยไข้ ปวดท้องน้อยด้านขวามา 2 วัน ตรวจร่างกายพบมีไข้ (38.5° C) ปวดและกดเจ็บบริเวณท้องน้อยด้านขวา เอกซเรย์ช่องท้องพบมีภาวะ partial small bowel obstruction ให้การวินิจฉัยขั้นต้นเป็นไส้ติ่งอักเสบ อัลตราซาวด์พบ generalized bowel dilatation และ laminated hyperechoic lesion at distal small bowel ขนาดประมาณ 2.4x 2.9 เซนติเมตร ซึ่งสงสัยจะเป็นนิ่ว จึงได้ทำเอกซเรย์คอมพิวเตอร์พบว่ามี generalized small bowel dilatation และเห็น laminated stone at terminal ileum. ผู้ป่วยได้รับการผ่าตัดพบ gallstone ขนาดประมาณ 2 x 2 cm.ที่ terminal ileum นอกจากนั้นยังพบรูเล็ก ๆ และ adhesion ที่ 1st part duodenum ผู้ป่วยได้รับการผ่าตัดทำ enterotomy ทำ cholecystectomy ทำ repaired duodenum with omental patch ทำhepatoduocojejunostomy and jejunojejunostomy with bowel loop.

Introduction

Gallstone ileus is a rare complication of chronic cholecystitis with gall stone[1-5,,8]. It occurs when a stone passes into the small bowel and causes small bowel obstruction. It occurs about 1-4 % of all cases of bowel obstruction[2,7] and seems to increase to 25% of all nonstrangulated intestinal obstruction [1,3]. Mortality rate of gall stone ileus range between 8% and 30%[1]. It usually occurs in elderly elderly patient with a female predominance[1]. Intestinal obstruction results when the stone enters the GI tract usually through a cholecystenteric fistula between gallbladder and duodenum and impacts at ileocecal valve. The mortality and morbidity rate of the disease remain high due to delayed diagnosis and miss diagnosis[6,7]. Early diagnosis and prompt treatment may reduce the morbidity and mortality rate. Diagnostic imaging plays an important role in the diagnosis of patients with suspected gallstone ileus. The diagnostic imaging include plain abdomen radiograph, ultrasound, CT and occasionally MRI. However MDCT is best diagnostic technique for diagnosis of gallstone ileus in patient with acute abdominal pain and provide more accurate information to clinicians for surgical treatment[8,9,10].

Case report

A 77 years old male presented with abdominal pain at right lower abdomen and intermittent vomiting for 2 days. He had no defecate and flatus which were suspected sign of bowel obstruction. One day before admission, he had fever and still presented of abdominal pain. He was not known to have gallstone. On physical

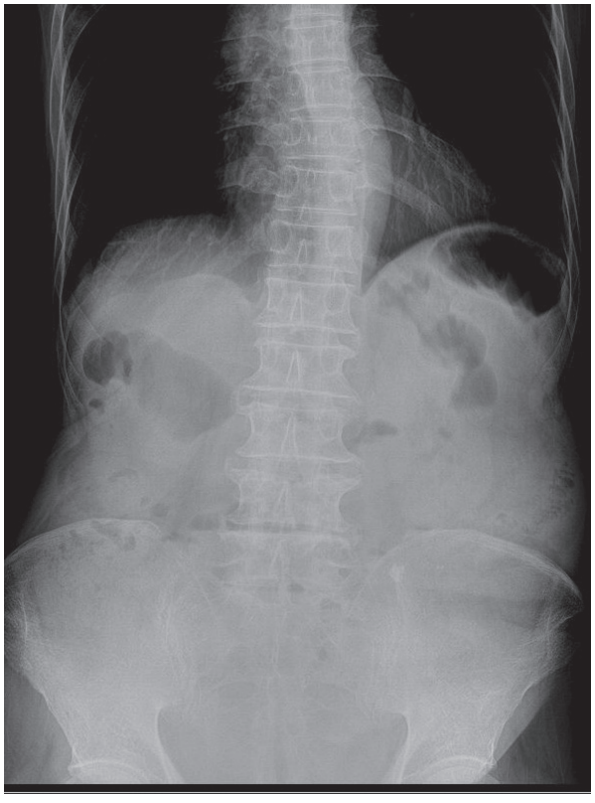

Figure 1 The plain abdomen radiograph shows few small bowel loop dilatation (small arrow), stone (big arrow), no detection of pneumobilia.

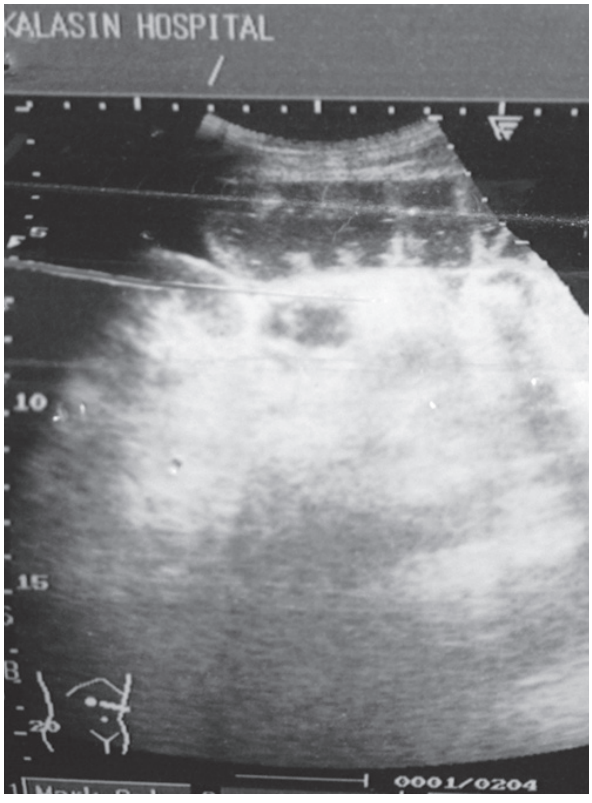

Figure 2 Ultrasonography shows small bowel dilatation with fluid fill dilated small bowel (arrow).

examination, he had fever. His temperature was 38.5° C and pulse rate was 114/ minute. Blood pressure and respiratory rate were normal. The abdomen was distended, tympanic on percussion accompanying with mark tender and voluntary guarding at right lower abdomen. The initial diagnosis was acute appendicitis, however blood tests was not show leukocytosis and urine analysis was normal. The imaging studies consist of plain abdomen radiograph, ultrasound abdomen and MDCT of whole abdomen.

Plain abdominal radiograph of our patient showed opaque stone, small bowel dilatation and no pneumobilia (Figure 1). Ultrasound findings were generalized bowel dilatation, deformed contour of the gallbladder, no detectable of the pneumobilia, however visible laminated hyperechoic lesion with posterior acoustic shadow suspect locate at distal ileum (Figure 2, 3).

MDCT reveals minimal aerobilia, generalized dilatation of small bowel loops, deformed gallbladder with fistula between gallbladder and duodenum, accompanying with visible laminated calcific lesion at distal ileum (Figure 4).

Preoperative diagnosis was gallstone ileus. He was explored laparotomy. In operative findings were gallstone size about 2 x 2 cm. at terminal ileum, small pore at duodenum and gallbladder and adhesion at 1st part duodenum. The operative procedures were explored with enterotomy, cholecystectomy, repaired duodenum with omental patch, hepatoduocojejunostomy

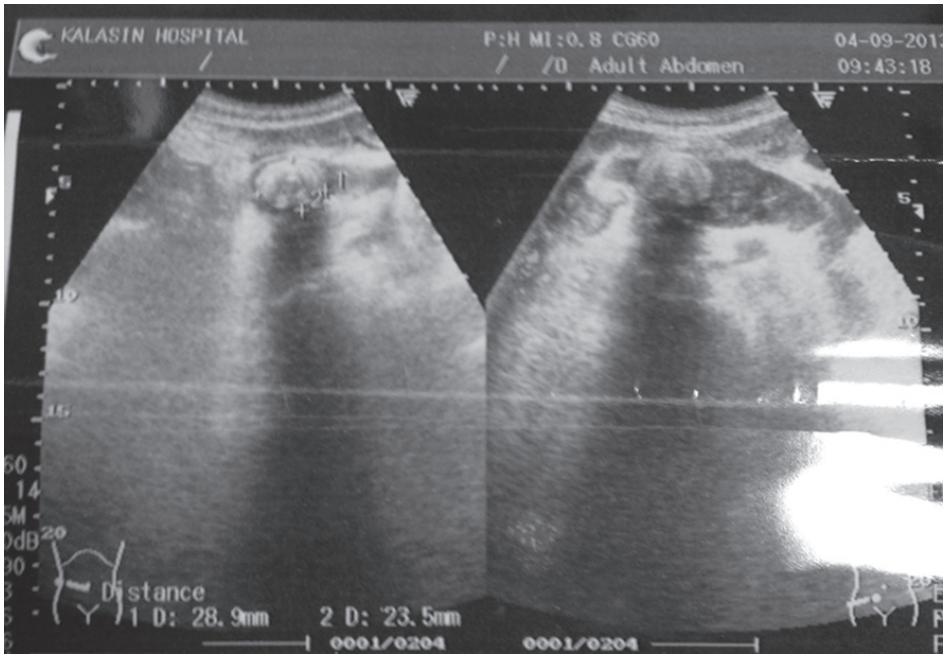

Figure 3 Ultrasonography shows well-defined lamonated hyperechoic lesion size about 2.4x2.9 cm. in distal small bowel which is stone (arrow).

and jejunojejunostomy with bowel loop. Post-operative pathological diagnosis was chronic cholecystitis with acute exacerbation with gangrenous mucosa.

Discussion

The term gallstone ileus was first coin Bartholini in 1654, which is a mechanical intestinal obstruction. The cause of obstruction is one or more gall stones impact within the lumen of bowel. The gall stone passes into GI tract through a biliary-enteric fistula. Gallstone ileus is a rare complication of gallstone which is more common in woman[1-5,8]. Fistula formation of the stone occurs spontaneously through wall of the gallbladder or common bile duct into bowel[1]. The most common location of biliary-enteric fistula, in decreasing order of incidence are cholecystoduodenal, cholecystocolonic, cholecystogastric and choledochoduodenal[3]. The gallstone should be ≥2-2.5 cm. in diameter to cause obstruction and impaction of the stone can occur in any part of bowel[1,2]. The most common locations of gall stone impaction are terminal ileum and ileocecal valve because of their narrow lumen and potentially less active peristalsis[3].

Classic imaging findings (Rigler's triad) are an ectopic gallstone within bowel lumen, pneumobilia and intestinal obstruction[1,2,3,4]. No pneumobilia or absence of significant calcification of the stone may be reasons for delayed diagnosis. Plain abdomen radiograph usually show non-specific findings for diagnosis the disease because gall stones usually are not visualization on plain radiograph. Ultrasonography is useful to confirm gall stone [6]. CT become to best diagnostic modality for diagnosis of gall stone ileus.

In this patient, he is male who is less common. His gallstone was size about 2 x 2 cm., however it passed through cholecystoduodenal fistula to occlude in terminal ileum which corresponding to common sites of fistula and occlusion part. Plain abdominal

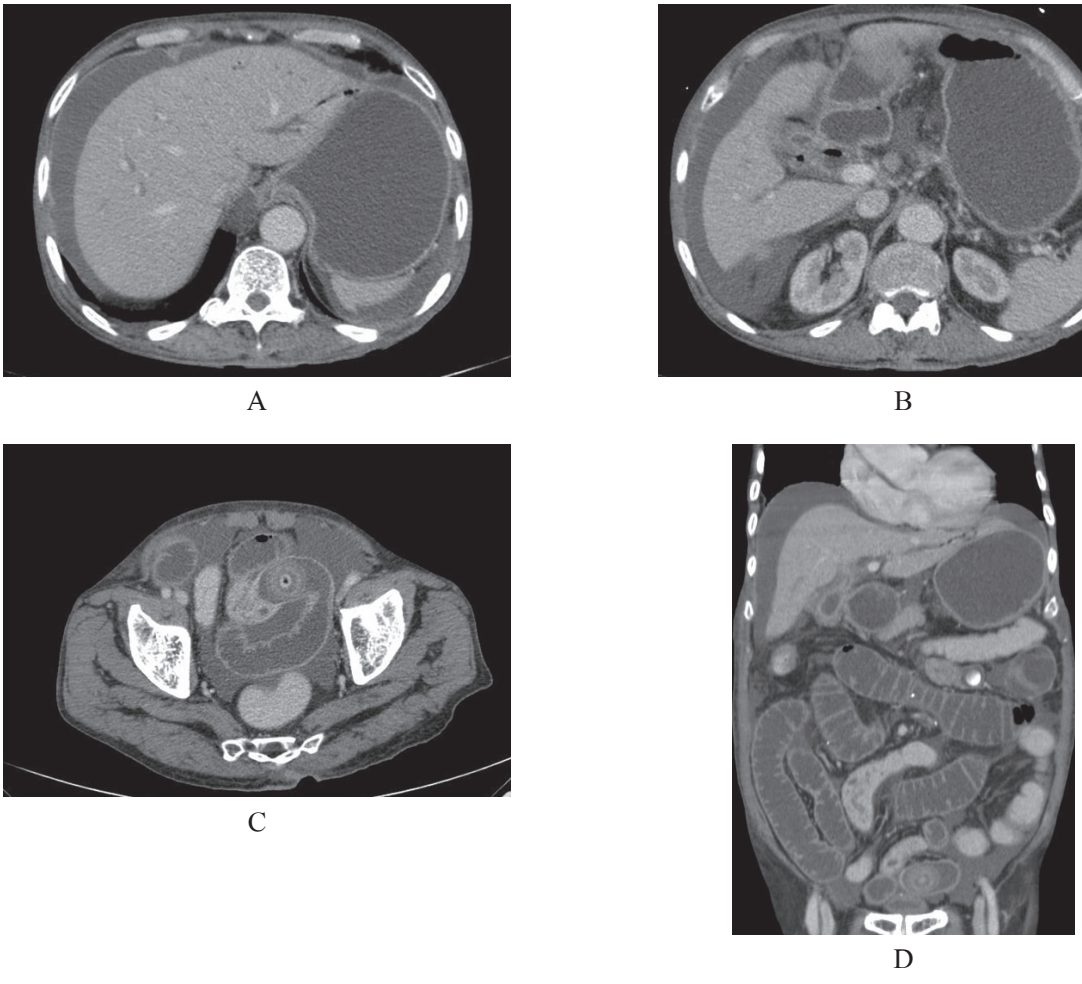

Figure 4 MDCT of abdomen show pneumobilia (white arrow) (A), deformed gallbladder (black arrow) with suspected fistula between gallbladder and duodenum (white arrow) (B), small bowel dilation (white arrow) (C, D) and stone in terminal ileum (black arrow) (C, D).

radiograph of our patient showed opaque stone, small bowel obstruction and no pneumobilia. Ultrasound findings were generalized bowel dilatation, deformed contour of the gallbladder, no detectable of the pneumobilia , however visible laminated hyperechoic lesion with posterior acoustic shadow suspect locate at distal ileum. MDCT showed free fluid in abdomen, minimal aerobilia, generalized dilatation of small bowel loops, deformed gallbladder with fistula between gallbladder and duodenum, accompanying with visible laminated calcific lesion at distal ileum.

In conclusion, gallstone ileus is a rare condition affecting mainly in elderly patients with female predominance, aware that can occur in male same to be our case. If not aware for gallstone ileus in patient of acute abdominal pain, may be delayed diagnosis which causing more complication and increase mortality rate. The advantage of imagings, especially CT which is the preferred modality for diagnosis gall stone ileus because CT has made it easier to diagnosis.

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