Biolife 5(3):309-313
AN INTERNATIONAL QUARTERLY JOURNAL OF BIOLOGY & LIFE SCIENCES
ISSN (online): 2320-4257
www.biolifejournals.com
BIOLIFE CASE REPORT

Gallstone ileus: a friquently missed diagnosis, case report and review of literatures

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ABSTRACT

Gall stone ileus is a rare complication of the commonly encountered disease cholelithiasis. It represents a serious geriatric surgical emergency that have to be considered in any case of intestinal obstruction in the elderly even in the absence of previous history of symptomatizing cholelithiasis. We present a case of gall stone ileus that has presented to our emergency department 6 days following the onset of obstructive bowel symptoms and gave a history of cholelithiasis. The case was readily diagnosed by abdominal CT study and successfully managed by enterolithotomy and later discharged uneventfully. With review of the literature, early diagnosis and prompt management plays the major role in decreasing the high disease associated mortality. CT scan of the abdomen may aid for early diagnosis and proper treatment. The treatment also will remain controversial between enterolithotomy alone, the one stage operation and the two stage operation.

Key words: gallstone ileus, enterolithotomy, one stage operation, recurrence.

INTRODUCTION

Gall stone ileus is a clinical entity defined as the mechanical bowel obstruction caused by impaction of a gall stone after its migration from the gall bladder towards the intestine.(1)

Despite its rarity as a complication of cholelithiasis (0.3-0.5%)(2)and as a cause of intestinal obstruction (1-3%),(3, 4)gall stone ileus still represents a serious geriatric surgical emergency accounting for up to 25% of cases of unstrangulated small bowel obstruction above the age of 65(5)with estimated related mortality ranging from 12% up to 27%.(6)

Co-morbidities related to old age, delayed and misdiagnosis are the most commonly incriminated factors attributing to the high disease associated morbidity and mortality.(4, 6-9)

How to Site This Article:
Mourad M and Selim A. Seham Abou Shousha, Malak Zoheir, Mahmoud Hemida, Yasmine Shahine (2017). Gallstone ileus: a friquently missed diagnosis, case report and review of literatures. Biolife. 5(3), pp 309-313.

DOI: 10.5281/zenodo.7364771
Received: 3 July 2017;
Accepted; 18 August 2017;
Available online : 1 September 2017

With age related co-morbidities being an unchangeable factor, all the modern literature is considering early diagnosis with subsequent prompt management is the main stay in reducing the disease associated mortality.(1, 6)

After being confronted by a case of gall stone ileus, we were motivated to review the literature hoping to increase the suspicion index of such rare clinical condition.

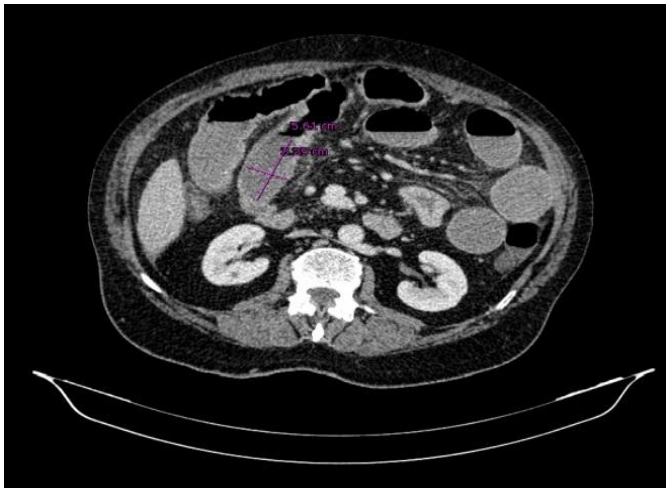
CASE REPORT

A 68 years old male patient presented to the emergency department of Alexandria University main hospital complaining of intermittent periumblical colicky pain and gaseous abdominal distension for 6 days before admission that was associated with nausea but no vomiting or fever. The patient is known to have gall stones discovered by ultrasound imaging of the abdomen that was done for investigating right hypochondrial pain 2 years preceding his presentation to us, since that time they were not symptomatizing.

Abdominal examination revealed marked gaseous abdominal distention, with mild tenderness allover, hernial orifices were free except for small uncomplicated para-umblical hernia, digital rectal examination revealed empty collapsed rectum. Nasogastric tube was inserted giving feculent content.

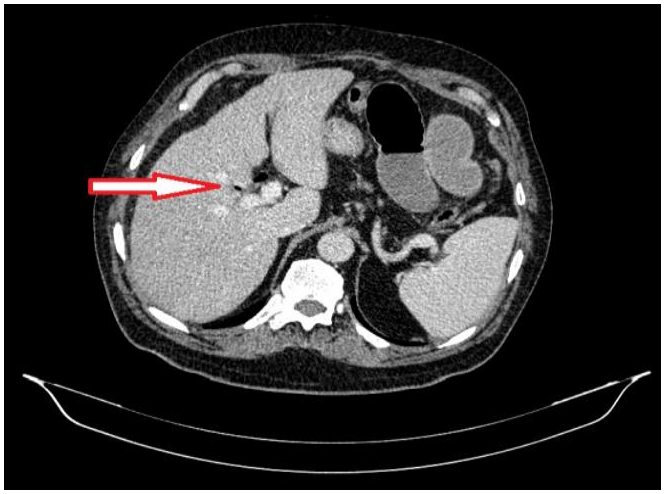
Routine laboratory investigations was unremarkable, plain x-ray abdomen in standing position revealed gaseous distension. CT scan of the abdomen revealed small bowel distension reaching 4.5 cm in diameter with a transitional zone at the mid-ileum where a faintly dense oval structure measuring 4 cm with hyper dense foci was noted; also evident aerobilia was found (Figure 1 & 2).

Figure-1. CT scan of the abdomen revealing mechanical small intestinal obstruction by ectopic gall stone measuring 5x3 cm.



Abdominal exploration revealed small bowel dilatation with obstructing hard mass at the terminal ileum. The terminal ileum and the colon were collapsed (Figure 3). Backward displacement of the hard mass to a healthy intestinal segment, an enterotomy was done with extraction of the hard obstructing mass that was later proven to be a gall stone by pathological examination and closure of the enterotomy was done (Figure-4).

Figure-1. Aerobilia was evident in the CT scan of the abdomen (arrow).



Exploration of the rest of the small intestine was negative for any other stones. Exploration of the gall bladder vicinity was hindered by the dense fibrosis present at time of operation. The patient was discharged 8 days later with uneventful postoperative recovery. Magnetic resonance cholangio-pancreatography was done 1 month later which revealed presence of cholecysto-duodenal fistula but no residual stones in the gall bladder. No interval cholecystectomy was planned due to absence of residual gall bladder stone.

Figure-2. Intra-operative picture showing mechanical small intestinal obstruction with the arrow pointing to the site of the gall stone.

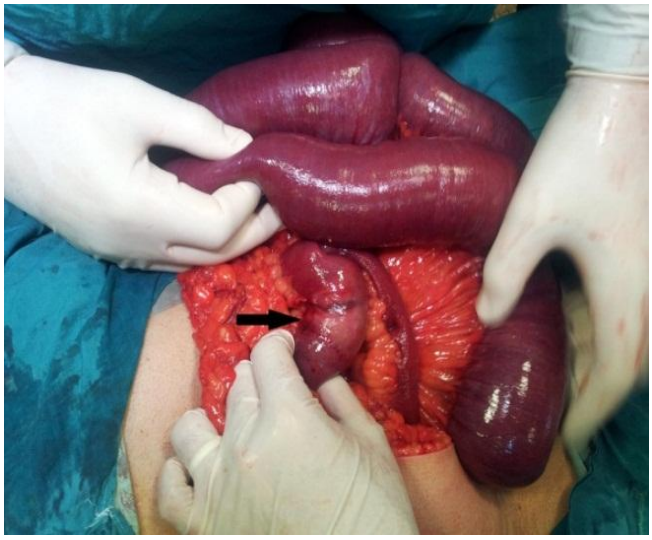


Figure-3. Picture of the gall stone measuring 4.2x2.3 cm during extraction through the enterolithotomy.

DISCUSSION

The term gall stone ileus was first stated by Dr. Erasmus Bartholin in 1654 to describe the phenomenon of mechanical bowel obstruction caused by impaction of one or more gall stones in the bowel lumen.[10] Although this impaction represents a true mechanical bowel

obstruction, the misnomer gall stone ileus is still used to describe the condition in the modern literature.[11, 12]

In general, gall stone ileus is a rare complication of cholelithiasis (0.3-0.5%),[2]and a rare cause of intestinal obstruction (1-3%). But when it comes to the elderly, it represents a serious surgical emergency causing up to 25% of non-strangulated mechanical small bowel obstruction above the age of 65.[3-5]

The typical age of affection usually ranges from 65 to 75 years[9, 13-15] with the youngest case reported being 13 years old and the oldest being 97.[5]Gall stone ileus shows an obvious female predilection with an estimated male to female ratio ranging from 1:2 up to 1:16.[3, 4, 13]

Usually the gall stone gain access into the intestinal lumen through a bilio-digestive fistula following an attack of acute cholecystitis with subsequent inflammation and adhesions with an adjacent part of the gastrointestinal tract,then the large stone will cause pressure necrosis leading to the formation of the fistula.[5, 11]The fistula is usually a cholecysto-duodenal one (68%-96.5) but cholecysto-jeujunal, cholecysto-colonic (5-25%), cholecysto-gastric and even choledocho-enteric fistulas have also been reported.[16]

Some authors have also reported cases of gall stone ileus following ERCP and sphincterotomy or even after laparoscopic cholecystectomy complicated by lost intraperitoneal stones that have migrated through the intestinal wall.[17, 18]

The size of the migrating stone is a major factor in determining the bowel obstruction. Fortunately, most of the gall stones located within the bowel lumen will be small enough to pass via stool with only 6% of stones having the ability of causing clinical bowel obstruction which are thought by most authors to be those with a diameter exceeding 2.5 cm.[14, 16]

Other factors that can play a role in the onset of intestinal obstruction is the presence of a previous digestive pathology causing luminal stenosis such as Chron's disease.[16]

Being the part with the narrowest lumen and the lowest peristalsis has made terminal ileum and ileo-ceacal valve the most frequently realized site of gall stone impaction (65-75%), also the potential reactive substances in the bile can interact with the lining epithelium cells of the ileum and can induce the impaction of the gallstone associated with lesions of the mucosa.[19] This is followed by the jejunum (25%). Stone impaction at the duodenum, colon, the base of a Meckel's diverticulum and even the appendix has been reported.[16, 20]

Establishing a pre-operative diagnosis of gall stone ileus is a challenging process with up to 50% of cases diagnosed at laparotomy.[4]The clinical presentation is usually nonspecific and patients mainly exhibit the typical symptoms of intestinal obstruction as pain, nausea, vomiting, distention and obstipation with absent history of symptomatic cholelithiasis in 30% of cases.[13]Sometimes the patient is presented by intermittent obstruction called "tumbling obstruction" due to halting movement of the gallstone through the gastrointestinal tract.[5, 15]Some cases may present by hematemesis due to duodenal erosions caused by stone migration.[16] There is usually an average delay of 7 days between the onset of symptoms and the hospital admission due to intermittent gall stone movement till the impaction.[16] This delay together with the non-specificity of symptoms that adds an average of 3.7 days delay till the surgical intervention as well as the fragility of affected population lead to the high disease related mortality (12-27%)[6], as compared with adhesive small intestinal obstruction related mortality (7-10%).[21]

Generally, a clinical pre-operative diagnosis can be highly suggested by the presence of the Mordor's triad which comprises the history of cholelithiasis (in only 50% of cases), clinical signs of cholecystitis and sudden onset of intestinal obstruction.[16]

Apart from thorough laboratory investigations that evaluate the general patient condition and hydration state, selected radiological investigations should be carried out to establish the diagnosis. The classic radiological triad of diagnosing gall stone ileus (pneumobilia, intestinal obstruction and ectopic gall stone) was first described by Rigler in 1941 and subsequently named after him. The presence of 2 out of three signs of the triad is generally sufficient to consider the diagnosis. A fourth sign that can complete a Rigler's tetrad is a shift in the position of gall stone observed in a previous study.[5, 16]

After comparing the value of different radiological studies in detecting the Rigler's triad, data revealed that the triad was present in 14.8% of plain abdominal films, 11.1% of abdominal ultrasonography and 77.7% of abdominal CT.[16, 22, 23]

Abdominal CT is by far considered the optimal tool not only in diagnosing but also in deciding the management strategy of gall stone ileus as concluded by Yu et al[23] who studied the value of CT in gallstone ileus, that depends upon the estimation of the size of the stone through the CT, stone of 2cm size or less can pass with the stool and response well on conservative treatment lowering the high mortality rate of the disease.

Besides its high ability to detect the classic Rigler's triad, the CT scan can offer other crucial information as the presence of gall bladder modifications (edema and inflammation) or bilio-digestive fistula and the exact estimation of the impacted stone size, site and number. All these gave it an estimated sensitivity of 93%, specificity of 100% and a 99% accuracy of the diagnosis.[23]

The principal goal of management of gall stone ileus is the quick relief of mechanical bowel obstruction by removing the impacted stone with surgical intervention being the treatment of choice.[15]

Surgical intervention should be carried out after hydro-electrolytic rebalance and correction of associated co-morbidities. Simply the management of gall stone ileus is a matter of the surgical strategy more than being a matter of the surgical technique and the timing of intervention should be chosen carefully.[16]

The appropriate surgical technique for the emergency management of gall stone ileus is a matter of debate with enterolithotomy only and the one stage operation entailing enterolithotomy, cholecystectomy and repair of fistula being the main poles of argument.[16]

Most authors supporting the enterolithotomy are doing so depending on its ability to achieve a less time consuming relief of the intestinal obstruction with al less demanding technique.[12]The risk of recurrent gall stone ileus, cholecystitis, cholangitis and gall bladder cancer arethe main drawbacksfrequently stimulated as regard to this technique.

On the other hand, the one stage operation is associated with a prolonged operative time and a higher mortality rate in an already old fragile population and should be mainly preserved for hemodynamically stable patients.[12]

The mortality rate of the one stage operation is 16.9% while mortality rate following enterolithotomy alone is 11.7% as described by Reisner et al on 1001 cases, although, this difference did not reach statistical significance ($P < 0.17$).[4]Recurrent gallstone ileus is believed to be a rare condition (5-9%) with 80-90% of spontaneous passage of recurrent stones.[5, 9] Also this drawback can be generally reduced by palpating all parts of bowel and gall bladder during the operation to ensure absence of any retained stones.[4, 9, 15] Also, this is supported by the autopsy finding of the spontaneous closure of the bilioenteric fistula after removal of the distal obstruction.[4]

While the studies which advocate the one stage operation relies on a higher estimated risk of recurrence which reach 17% as described in Clavien et al.[3]

Justification of both surgical techniques has resulted in a third treatment modality what is known as the two stage operation consisting of emergency control of obstruction by enterolithotomy followed by definitive control of the biliary pathology by cholecystectomy and fistula closure 4-6 weeks later.[16, 24]this is usually reserved for young patients with symptomatic biliary disease and residual gall bladder stones.[16, 25]

Resection and anastomosis could be also adopted in cases of impacted stones causing irreversible bowel damage.[1]Laparoscopic or even laparoscopically assisted extraction of impacted gall stones is not gaining a good repetition because of its difficulty and prolonged time consumption.[26]

Interventional endoscopy has also been introduced for extraction of the impacted stones and can be assisted by ESWL (extracorporeal shockwave lithotripsy), YAG (Yttrium-Aluminum-Garnet) laser or even EHL (electrohydraulic lithotripsy).[16, 27, 28]

After all and by justifying the data available in literature, most authors concluded that the best technique in managing gall stone ileus was and mostly will remain an unanswered question and that the management of gall stone ileus should be individualized according to the patient presentation and associated co-morbidities and guided by the surgeon's clinical judgment.

Conflict of Interests

Authors declare that there is no conflict of interests regarding the publication of this paper.

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