

# Acute intestinal obstruction due to gallstone ileus

## *Abdome agudo por obstrução por ileobiliar*

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### A B S T R A C T

**Objective:** Small bowel obstruction (SBO) due to gallstones (gallstone ileus) is an uncommon complication of cholelithiasis, for which there is no defined surgical procedure. The objective of this study was to perform a systematic review of the history, available image exams and clinical approach to the diagnosis and treatment of gallstone ileus. **Method:** We conducted a retrospective study in a university hospital including all cases of SBO treated over a period of 23 years. According to the surgical treatment, the patients were divided into two groups: (1) enterolithotomy with posterior cholecystectomy (two-stage surgery); and (2) enterolithotomy, cholecystectomy and fistula closure (one-stage surgery). **Results:** Twelve patients were included in the study, including 11 females (91,6%), with a mean age of 72.2 years. All patients presented associated diseases, mainly arterial hypertension (75%). All except one patient had multiple SBO symptoms. Gallstone ileus diagnosis was made before laparotomy in six patients (50%). There were eight patients in group 1 and four in group 2, and the morbidity was, respectively, 33.3% and 8.3%. Overall mortality was 16.6% (one patient in each group). **Conclusion:** Gallstone ileus should be suspected in the elderly with SBO symptoms. Early diagnosis can reduce post-operative complications. Treatment is urgent laparotomy and the surgical approach must be individualized for each case. The majority of patients in this study were treated with enterolithotomy, with cholecystectomy being performed later in two symptomatic patients.

**Key words:** Abdomen, acute. Intestinal obstruction. Ileum. Gallstones. Cholelithiasis/complications.

### INTRODUCTION

Biliary ileus (BI), first described by Erasmus Bartolim in 1654, is a rare cause of obstruction of the gastrointestinal tract (by gallstones) that may occur anywhere from the stomach to the rectum, the most common site being the small intestine<sup>1-4</sup>. It accounts for 1-3% of intestinal obstructions, and over 25% of occlusive situations in persons over 65 years<sup>2,5-8</sup>. Typically, BI starts with chronic cholelithiasis, which evolves with the formation of a cholecystoduodenal fistula, with the passing of a large calculus to the gastrointestinal tract, resulting in obstruction. Approximately 50% of patients with the disease have a history of gallstones, but only 0.3 to 1.5% of patients with gallstones present BI<sup>2,8-10</sup>.

Clinical examples are variable, inasmuch as the situation may be acute, chronic or intermittent<sup>9</sup>. In 50% of cases, diagnosis is made only during an exploratory laparotomy. Treatment consists of an enterotomy with

removal of the calculus. However, in selected cases a cholecystectomy with fistula treatment may be indicated in the same surgical procedure<sup>3,8,11,12</sup>.

The aim of this study is to describe the experience of the management of patients with acute intestinal obstruction by BI, from diagnosis to definitive treatment.

### METHODS

The study was conducted through a retrospective analysis of medical records of patients admitted with acute abdominal obstruction at the Clinics Hospital of Unicamp, and treated by the staff of the Division of Trauma Surgery. In the period from January 1990 to April 2013, 12 cases were identified in which the intraoperative diagnosis was BI.

The following factors were analyzed: age, gender, initial clinical presentation, associated diseases,

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complementary imaging for diagnosis, preoperative diagnosis, surgical procedure performed and postoperative outcome. As for surgical treatment, patients were divided into two groups: 1) treatment of intestinal obstruction, without addressing the blockage in the right hypochondrium, aimed at carrying out the smallest possible procedure for the alleviation of the acute intestinal obstruction; and 2) treatment of the blockage in the right hypochondrium and the cholecystoduodenal fistula, with cholecystectomy and duodenorrhaphy associated with the desobstruction procedure, in a single surgery (single-stage treatment).

The study was approved by the Ethics in Research Committee of the institution.

## RESULTS

Of the 12 patients surgically treated for BI, 11 (91.6%) were female. The age of the patients ranged from 57 to 88, with a mean of 72.2 years.

The clinical presentation was intestinal obstruction in ten patients (83.3%) and all of them showed absence of flatus and feces elimination for a period exceeding three days, associated with diffuse abdominal pain of varying intensity. Two patients (20%) had a history of pain in the right hypochondrium. Six patients (50%) presented vomiting on admission, and one of them reported the presence of "stones" in the vomit. One patient presented an intestinal sub-occlusion for 30 days and another had diarrhea and fever, associated with other signs and symptoms, showing the severity of the clinical situation, but also confusing the preoperative diagnosis. Two patients (20%) had previous abdominal surgery. All the individuals had at least one associated chronic disease: high blood pressure (nine cases), heart disease (three cases), diabetes mellitus (two cases), osteoarthritis, depression and hypothyroidism (one case each).

Five patients (41.6%) presented with clinical and laboratory signs of dehydration and two (16.6%) showed signs of peritonitis.

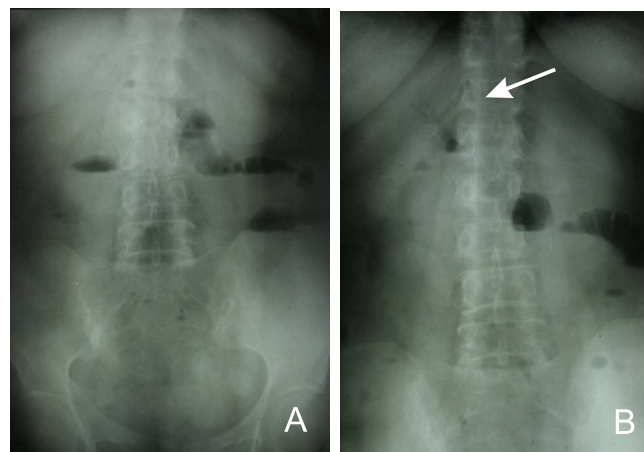
A simple radiographic examination (X-ray) of the abdomen was performed in the eleven cases. Six patients (50%) had small intestine distension with air-fluid levels and intestinal edema (Figures 1A and 1B). Aerobilia was identified in two cases from simple X-rays of the abdomen (16.6% - Figure 1B). A complete ultrasound of the abdomen

was performed on five patients (41.6%), showing aerobilia associated with a stone in the small intestine, cholecystoduodenal fistula and, in another case, it was conclusive for the diagnosis of BI. Computerized Tomography (CT) scan of the abdomen was performed on six patients (50%), showing aerobilia in ten cases (83.3%), as well as signs of cholecystitis; it also showed the stone impacted in the small intestine in three of these cases (Figures 2A, 2B and 2C). In one of these cases, there was evidence of stones in the stomach and duodenum, with an obstruction in the duodenojejunal junction.

BI was the preoperative diagnosis in six patients (50%), acute intestinal obstruction of unknown etiology in five patients (41.6%) and acute abdominal inflammation in another (8.3%). Time between admission and surgery ranged from nine hours to eight days (median 24 hours), the latter due to clinical conditions of the patients.

In one case, an upper endoscopy was performed preoperatively, showing a cholecystoduodenal fistula, duodenal obstruction by gallstones, and partial removal of these stones was performed.

All patients underwent exploratory laparotomy with a midline incision. Eight patients were included (66.6%) in group 1, not consecutively, merely, resolving the patient's intestinal obstruction (Figures 3 A, B and C). Four patients (33.3%) were included in group 2, with cholecystoduodenal fistula repair: cholecystectomy and duodenorrhaphy, associated with the desobstruction procedure. There was

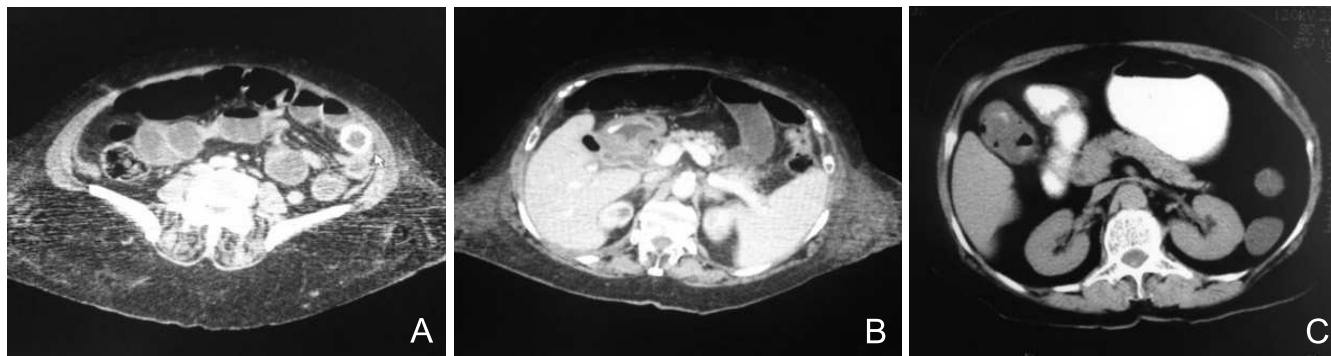


**Figure 1** - A: X-ray of the abdomen showing air-fluid levels. B: presence of air in the bile ducts.

**Table 1** - Radiological signs for the diagnosis of BI.

### Rigler Criteria

1. Air or contrast in the biliary tract
2. X-ray showing partial or complete intestinal obstruction
3. Direct or indirect visualization of the gallstone by means of contrast in the gut
4. Change in the position of the previously observed gallstone



**Figure 2** - CT scan of the abdomen. A: With contrast, showing unobtrusive calcification in the small intestine. B: Air in the gallbladder bed, with a blockage of bowel loops in the region. C: Air in the gallbladder, which has thickened walls.



**Figure 3** - Surgical treatment. A: Intraoperative view of looped segments of the ileus. B: Enterolithotomy of the jejunum. C: Gallstone.

evidence of severe inflammatory obstruction in the right hypochondrium in all patients of both groups.

During the postoperative period, morbidity was 33.3% (Table 1). One patient had eventration, and we opted for non-operative treatment due to age and surgical risk; two patients had prolonged ileus, increasing hospitalization time, but progressed well with clinical treatment; one patient had surgical wound infection. Seven patients (66.7%) were discharged uneventfully.

Two patients (20%) died due to complications from chronic diseases. One patient in group 1 returned due to a recurrence of BI, and was retreated with a resection of the segment of the small intestine where the gallstone was impacted, primary anastomosis, cholecystectomy and suturing of the cholecystoduodenal fistula. She developed

a stercoraceous fistula, and treated with an ileostomy. The patient died three months after the second procedure due to medical complications. The other case, returned after a self-inflicted stab wound to the abdomen during a psychotic episode. Exploratory laparotomy revealed no intra-abdominal injuries, but an enterectomy was performed on the segment where the gallstone was previously impacted due to its hardened appearance and partial stenosis of the ileum. This patient developed anastomotic dehiscence and peritonitis, eventually dying on the 5th postoperative day of relaparotomy due to infectious complications. There were not any duodenal fistulas in the four patients who underwent single-stage surgery, however.

Among the patients in group 1, who did not undergo cholecystectomy, two (one previously reported) needed retreatment, with removal of the gallbladder.

**Table 2** - Morbidity and mortality in the two groups.

Complication	Group 1 N = 8	Group 2 N = 4
Surgical wound infection	1 (12.5%)	-
Eventration	1 (12.5%)	-
Prolonged ileum	2 (25.0%)	-
Stercoraceous fistula	-	1 (25.0%)
Death	1 (12.5%)	1 (25.0%)

## DISCUSSION

Biliary ileus (BI) refers to a mechanical obstruction of any segment of the digestive tract caused by gallstones, which reach the viscera through a biliary fistula. The most frequent site of the impaction is the terminal ileum, which is the narrowest part of the small intestine<sup>2,3,8,11,13,14</sup>. Another site is the gastric outlet, causing stomach obstruction, which characterizes the Bouveret syndrome<sup>15-17</sup>.

The clinical picture is insidious and often there are no specific signs of biliary disease, which complicates the diagnosis. One should always suspect BI in the elderly with obstructions, however there are case reports showing the involvement of younger individuals. The mostly affected are the elderly, aged from 70 to 80 years, females and the obese, probably due to the higher incidence of lithiasis in the latter two groups<sup>2,3,11,18</sup>. The ratio of women to men affected is between 2.3:1 to 16:1<sup>2,8</sup>. This higher incidence of BI in the elderly and in females was also observed in the present study.

The main etiopathogenesis is chronic calculous cholecystitis which evolves with inflammation of the tissues adjacent to the gallbladder, forming adhesions between it and the intestine, but a history of bile duct disease may not exist in one third of the patients<sup>13,14,18</sup>. The calculus generates progressive erosion of the neighboring walls, forming a cholecystoduodenal fistula and migrating through it. The size of the stones varies from 1.9 to 3.5 cm in diameter. Thus, approximately 90% of cases are due to biliary pathology. Nonetheless, the fistula has been described as resulting from a malignant tumor, peptic ulcer, Crohn's disease and trauma<sup>10,11,13</sup>.

The patient presents with nonspecific symptoms, with signs of acute abdomen obstruction, such as nausea, vomiting, distension and abdominal pain. Some patients may present obstructions of an intermittent nature, with periods of improvement, suggesting the scrolling phenomenon called "tumbling", which corresponds to the distal migration of the stone<sup>13,14,18-20</sup>. The presence of diarrhea is frequent, which may cause confusion with gastroenteritis. In this study it was observed that only one patient had diarrhea during treatment. The symptoms usually appear from 3 to 5 days before a physician is sought<sup>2,6,9,19-21</sup>.

An abdominal X-ray may help in the preoperative stage and the most common radiological findings are: pneumobilia (presence of air in the bile duct), intestinal obstruction, visualization of an ectopic stone and the migration of a previously identified one. The former three correspond to the triad of Rigler and the identification of two of them is considered pathognomonic of BI, being found in 40 to 50% of cases. A fifth radiological sign has been described: the presence of air in the gall bladder, duodenum, or both, thereby forming two images of free fluid close to the first and second lumbar vertebrae<sup>13,14,19-23</sup>.

The abdominal ultrasound is useful for confirming the presence of cholelithiasis, and for showing a calcification image inside a looped intestinal segment, associated with distension of looped segments. In most of the references, ultrasound was not used as an isolated method for the diagnosis of BI<sup>21,24</sup>. The filling of the looped intestinal segments with a large amount of liquid and little gas favors the ultrasound diagnosis, and hinders that of the abdominal X-ray. When compared to radiography, ultrasound seems to be more sensitive to: initial obstruction of the small intestine, the presence of a small amount of air in the bile ducts or gallbladder, gallstones in atypical positions, concomitant calcifications, fistula between the gallbladder and the duodenum, and the presence of ascites or intestinal ischemia. The most important findings are: an altered gallbladder (more than with cholecystitis or gallbladder cancer), the presence of gas in the gallbladder or bile ducts, and looped intestinal segments filled with fluid, which can be followed to the site of the impaction of the stone<sup>24</sup>.

A CT scan, when compared to the two methods described above, purports to be more valuable, especially for identifying a mechanical intestinal obstruction, a small amount of air in the gallbladder and a gallstone<sup>11,22</sup>.

Endoscopic examinations may be useful both for the diagnosis and treatment of stones located in the duodenum or colon. The combination of imaging methods allows an earlier specific diagnosis, indicating a safer surgical treatment. In this study, the use of abdominal ultrasound and CT scan were decisive in the preoperative diagnosis of BI. However, there was a delay in the indication of a laparotomy in some cases at the expense of time spent in the diagnostic investigation and clinical compensation of the patient preoperatively. The preoperative diagnosis was correct in 50% of cases. In literature, the accuracy of preoperative diagnoses is from 13 to 48%<sup>2,21</sup>. For patients with severe associated illnesses and a high surgical risk, it is very risky to insist on non-operative treatment, monitoring the patient clinically and awaiting the elimination of the stone, although there are descriptions of this controversial conduct<sup>25</sup>. Some less invasive methods have been proposed for patients with a high surgical risk, depending on the location of the stone. An endoscopic removal can be attempted for stones located in the stomach and duodenum; a colonoscopy can be useful for diagnosis and even treatment of impacted stones in the colon and terminal ileum<sup>3,11</sup>.

The aim of the treatment is resolution of the intestinal obstruction. Since most patients with BI are of advanced age and usually have significant comorbidities, there is much controversy regarding the best surgical approach: isolated enterolithotomy or associated with treatment of the fistula and cholecystectomy, since in the latter case there would be an increase in surgical time, with increased morbidity and mortality, and no major benefits in the long term<sup>2,3,8,11,12,18,26,27</sup>. The resection of an

intestinal segment is indicated when there is irreversible vascular compromise or perforation of bowel. If fistula closure is not done, the patients may rarely experience a number of complications, such as recurrent BI (5-17%), gallbladder carcinoma, cholangitis and cholecystitis<sup>4,7</sup>. The largest literature review, carried out by Reisner and Cohen<sup>2</sup>, that cites more than 1000 cases, showed that one-time surgery has a higher mortality (17%) when compared to those in which there was no manipulation of either the gallbladder or the fistula (11.7%). Therefore, the addition of a cholecystectomy and treatment of the fistula are justified only in selected cases, those that can endure a prolonged surgery time. For patients with persistent symptoms, a cholecystectomy should be performed later<sup>8,18,26,27</sup>.

The two-stage treatment is to resolve the intestinal obstruction in the first surgery and correct the cholecystoduodenal fistula in an elective treatment. This procedure also raises discussion. Many authors argue that the risk of recurrence of BI, from 5% to 17%, is high, so there is need for definitive treatment of the fistula<sup>13,21,28,29</sup>. Other complications arising from maintaining the cholecystoduodenal fistula center on the risk of the patient having intestinal malabsorption, weight loss, recurrent pain, recurrent cholecystitis, cholangitis and gallbladder cancer<sup>3,14,28</sup>. In a 1965 study, an incidence of 15% of gallbladder cancer in patients with BI was noted, compared to only 0.8% in patients who underwent elective cholecystectomy<sup>28</sup>. Some authors have reported spontaneous closure of the fistula and argue that, if the

bile duct were open and there were no residual calcification, the cholecystoduodenal fistula could close spontaneously<sup>5,19,21</sup>. It is also emphasized that even if a fistula were present, the risk of complications is low and many fistulas are easily tolerated. Many authors consider that the second-stage surgery should only be carried out if there are symptoms related to the bile ducts or in patients with a high life expectancy<sup>3,18,19,27</sup>.

Surgery via laparoscopy is a good method for treatment by experienced teams, as it improves postoperative recovery<sup>26,27,30</sup>.

Postoperative BI is usually prolonged and the main complications are surgical wound infection, pneumonia and evisceration. The mortality rate varies from 5 to 25% in the larger studies<sup>2,14,18,21,27</sup>. In recent studies, a decrease in morbidity and mortality has been demonstrated in patients with BI, suggesting that the use of antibiotic prophylaxis, perioperative management and admission to intensive care units have important roles in reducing complications.

We conclude that BI is an uncommon cause of acute abdomen obstruction that requires a high index of suspicion, especially in elderly patients, for the diagnosis to be established. The management of BI should be individualized. The treatment of obstruction by way of gallstone removal by enterotomy is the initial choice for BI. A cholecystectomy and repair of the bilioenteric fistula can be performed along with stone removal. However, for patients with significant comorbidities and who are not able to endure a longer operative time, these procedures should be performed later.

## R E S U M O

**Objetivo:** descrever a experiência na abordagem dos doentes com abdome agudo por obstrução por IB, desde o diagnóstico até o tratamento definitivo. **Métodos:** estudo retrospectivo incluindo todos os casos de IB tratados em um período de 23 anos. De acordo com a abordagem cirúrgica realizada, os pacientes foram divididos em dois grupos (1) enterolitotomia com colecistectomia no segundo momento; e (2) enterolitotomia, colecistectomia e abordagem da fistula. **Resultados:** Doze pacientes foram incluídos, sendo 11 mulheres (91,6%), com média de idade de 72,2 anos. Todos os pacientes apresentavam doenças associadas, principalmente hipertensão arterial sistêmica (75%). Dois pacientes não apresentavam sintomas significativos de obstrução intestinal. O diagnóstico de IB foi realizado em seis pacientes (50%) antes da laparotomia. O grupo 1 foi constituído de oito pacientes e o grupo 2 de quatro, e a morbidade foi, respectivamente, 33,3% e 8,3%. A mortalidade foi 16,6% (um paciente de cada grupo). **Conclusão:** O manejo do IB deve ser individualizado. O tratamento da obstrução mediante remoção do cálculo biliar por enterotomia proximal é a escolha inicial para o tratamento do IB. A colecistectomia e a correção da fistula bilioentérica podem ser realizadas juntamente com a remoção do cálculo, no entanto, em pacientes com comorbidades significativas, esses procedimentos devem ser realizados posteriormente.

**Descritores:** Abdome agudo. Obstrução intestinal. Íleo. Cálculos biliares. Colelitíase/complicações.

## REFERENCES

- Martin F. Intestinal obstruction due to gall-stones: with report of three successful cases. *Ann Surg.* 1912;55(5):725-43.
- Reisner RM, Cohen JR. Gallstone ileus: a review of 1001 reported cases. *Am Surg.* 1994;60(6):441-6.
- Lobo DN, Jobling JC, Balfour TW. Gallstone ileus: diagnostic pitfalls and therapeutic successes. *J Clin Gastroenterol.* 2000;30(1):72-6.
- Hayes N, Saha S. Recurrent gallstone Ileus. *Clin Med Res.* 2012;10(4):236-9.
- Carrascosa MF, Riego-Martín MD, Salcines Caviedes JR, González Gutiérrez P. Gallstone ileus. *BMJ Case Rep.* 2012 Feb 21;2012.
- Rojas-Rojas DJ, Martínez-Ordaz JL, Romero-Hernández T. Biliary ileus: 10-years experience. *Cir Cir.* 2012;80(3):228-32.
- Tucker A, Garstin I. A peculiar cause of bowel obstruction. *Int J Surg Case Rep.* 2013;4(5):473-6.

8. Halabi WJ, Kang CY, Ketana, NK, Lafaro, KJ, Nguyen VK, Stamos MJ, et al. Surgery for gallstone ileus: a nationwide comparison of trends and outcomes. *Ann Surg.* 2013; jan 4 [Epub ahead of print].
9. Pronio A, Piroli S, Caporilli D, Ciamberlano B, Coluzzi M, Castellucci G, et al. Recurrent gallstone ileus: case report and literature review. *G Chir.* 2013;34(1-2):35-7.
10. Machado MAC, Jukemura J, Volpe P, Abdo EE, Penteado S, Bacchella T, et al. Fistulas biliares internas: estudo de 13 casos e revisão da literatura. *Hos Clin Fac Med S Paulo.* 1995;50(1):45-8.
11. Ayantunde AA, Agrawal A. Gallstone Ileus: diagnosis and management. *World J Surg.* 2007;31(6):1292-7.
12. Ravikumar R, Williams JG. The operative management of gallstone ileus. *Ann R Coll Surg Engl.* 2010;92(4):279-81.
13. Day EA, Marks C. Gallstone ileus: review of literature and presentation of thirty-four new cases. *Am J Surg.* 1975;129(5):552-8.
14. Deitz DM, Standage BA, Pinson CW, McConnell DB, Krippaehne WW. Improving the outcome in gallstone ileus. *Am J Surg.* 1986;151(5):572-6.
15. Bouveret L. Stenose du pylore, adherent a la vesicule calculeuse. *Rev Med.* 1896;16:1-16.
16. Gajendran M, Muniraj T, Gelrud A. A challenging case of gastric outlet obstruction (Bouveret's syndrome): a case report. *J Med Case Rep.* 2011;5:497.
17. Costil V, Jullès MC, Zins M, Loriau J. Bouveret's syndrome. An unusual localization of gallstone ileus. *J Visc Surg.* 2012;149(4):e284-6.
18. Kasahara Y, Umemura H, Shiraha S, Kuyama T, Sakata K, Kubota H. Gallstone ileus. Review of 112 patients in the Japanese literature. *Am J Surg.* 1980;140(3):437-40.
19. van Hillo M, van der Vliet JA, Wiggers T, Obertop H, Terpstra OT, Greep JM. Gallstone obstruction of the intestine: an analysis of ten patients and a review of the literature. *Surgery.* 1987;101(3):273-6.
20. Nuño-Guzmán CM, Arróniz-Jáuregui J, Moreno-Pérez PA, Chávez-Solís EA, Esparza-Arias N, Hernández-González CI. Gallstone ileus: one-stage surgery in a patient with intermittent obstruction. *World J Gastrointest Surg.* 2010;2(5):172-6.
21. Clavien PA, Richon J, Burgan S, Rohner A. Gallstone ileus. *Br J Surg.* 1990;77(7):737-42.
22. Murphy KP, Kearney DE, Mc Laughlin PD, Maher MM. Complete radiological findings in gallstone ileus. *J Neurogastroenterol Motil.* 2012;18(4):448-9.
23. Huang ST, Huang MY. Gallstone ileus: a diagnostic challenge by plain radiography. *Emerg Med J.* 2013;30(5):370.
24. Lasson A, Lorén I, Nilsson A, Nirhov N, Nilsson P. Ultrasonography in gallstone ileus: a diagnostic challenge. *Eur J Surg.* 1995;161(4):259-63.
25. Mishin I, Ghidirim G, Zastavitsky G. Non-operative treatment for gall-stone ileus – a case report. *Pol Przegl Chir.* 2011;83(4):223-6.
26. Conzo G, Mauriello C, Gambardella C, Napolitano S, Cavallo F, Tartaglia E, et al. Gallstone ileus: one-stage surgery in an elderly patient: one-stage surgery in gallstone ileus. *Int J Surg Case Rep.* 2013;4(3):316-8.
27. Mallipeddi MK, Pappas TN, Shapiro ML, Scarborough JE. Gallstone ileus: revisiting surgical outcomes using National Surgical Quality Improvement Program data. *J Surg Res.* 2013; May 31. [Epub ahead of print].
27. Beriner SD, Burson LC. One-stage repair for cholecyst-duodenal fistula and gallstone ileus. *Arch Surg.* 1965;90:313-6.
28. Jones R, Broman D, Hawkins R, Corless D. Twice recurrent gallstone ileus: a case report. *J Med Case Rep.* 2012; 6(1):362.
29. Paiva-Coronel G, Martínez-Ramos D, Cosa-Rodríguez R, Salvador-Sanchis JL. Íleo biliar. Abordaje asistido por laparoscopia. *Cir Esp.* 2010;87(4):255-6.

Received on 15/08/2012

Accepted for publication 18/10/2012

Conflict of interest: none

Source of funding: none

#### How to cite this article:

Alencastro MC, Cardoso KT, Mendes CA, Boteon YL, Carvalho RB, Fraga GP. Acute intestinal obstruction due to gallstone ileus. *Rev Col Bras Cir.* [periódico na Internet] 2013;40(4). Disponível em URL: <http://www.scielo.br/rcbc>

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