Minimally invasive approach in gallstone ileus. A case report

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Abstract: Introduction: Gallstone ileus (BI) is described as the intraluminal transit of one or more large biliary stones (> 2 cm) through the digestive tract, by means of a bilioenteric fistula, conditioning its impaction and therefore intestinal occlusion. It is an infrequent consequence, of insidious course, causing delay in treatment and increased morbidity and mortality. Diagnostic suspicion and initial surgical management are essential for a favorable clinical evolution.

Clinical case: 63-year-old female with abdominal pain, clinical data of occlusion and imaging studies with characteristic data of BI. Diagnostic laparoscopy and minimally invasive management were performed to extract the gallstone, with a satisfactory postoperative period. Discussion: IB is a rare entity, surgical resolution through a minimally invasive approach in selected patients represents a safe treatment option. Conclusions: The minimally invasive surgical procedure, by means of enterotomy, stone extraction and laparoscopic enterorraphy in the first surgical stage with cholecystectomy in the second stage is the ideal surgical treatment, safe and with less morbidity and mortality.

Key words: Gallstone ileus, minimally invasive surgery.

Introduction

allstone ileus (BI) is traditionally described as the intraluminal transit of one or more large bile stones, generally larger than 2 cm, through the digestive tract due to the communication of the bile duct and the intestine that causes impaction and due to hence a mechanical occlusion. It represents from 1% to 4% of all cases of intestinal occlusion, with a predominance in the female sex 3.5 - 6: 1 and in those over 65 years of age, so that comorbidities are present in 80-90%. [1-3] This disease was first described in 1654 in a necropsy by Erasmus Bartolim. [1,2]. It is an infrequent consequence (<1%) of a biliary enteric fistula, be it hepatoduodenal, choledochoduodenal, cholecystogastric, cholecystojejunal, cholecystocolonic or cystoduodenal, the latter being the most common, representing 85% of cases; it usually precedes an acute inflammatory process of cholelithiasis or chronic cholecystitis as in Mirizzi Syndrome. [4] It is estimated that 0.3% to 1.5% of patients with cholelithiasis will develop gallstone ileus. [5] However, there are reports of cases of gallstone ileus secondary to cholecystectomy due to incidental passage of stones, growth in situ due to transit of microlithiasis through the ampulla of Vater in an intestine with parietal occlusion due to neoplasms or stenosis due to inflammatory diseases such as the

inflammatory bowel disease. Crohn's disease, diverticular disease and previous radiation. [6.7]

The pathophysiology is headed by the impaction of the gallstone that causes inflammation in the mucosa with the subsequent decrease in arterial, venous and lymphatic flow, giving rise to ischemia and necrosis with communication to the surrounding organs. The most common topography is the ileum (60%) followed by the jejunum (16%), stomach (14.2%), colon (4%) and duodenum (3.5%). [7] Depending on the impaction site of the biliary stone, it can present as Bouveret's Syndrome in cases of occlusion at the level of the pylorus or duodenal bulb or Barnard's Syndrome, due to occlusion in the ileocecal valve. [2.8]

It generally has an insidious course, which causes delay in treatment, increasing morbidity and mortality, with mortality rates of up to 16%. It can be classified according to the time of evolution in acute, with abrupt clinical presentation of total and chronic intestinal occlusion, whose predominant symptom is intermittent nonspecific abdominal pain due to partial intestinal occlusion.

The predominant symptoms are abdominal pain, abdominal distension, nausea, vomiting and the absence of flatus. The diagnostic suspicion increases if there is a history of biliary colic due to cholelithiasis

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Figure 1. Standing and decubitus abdominal radiographs: Dilatation of the loops of the small intestine with air-fluid levels and pneumobilia.

and that at the time of the evaluation there are signs of acute cholecystitis; a presentation called the Triad of Mordor. The average duration of the clinical picture prior to surgery is 7 to 10 days. [2.9] It is imperative to perform imaging studies, find an abdominal X-ray. whose sensitivity is 40-70%, in which the dilation of the small intestine with air-fluid levels, pneumobilia (Gotta-Mentschler sign) and the ectopic stone can be observed, Present in less than 10% and more frequently in the right iliac fossa, the documentation of these findings is known as Rigler's triad, if a change in position of the gallstone is also confirmed, it is called Rigler's tetrad. [2] The one with 2 or more signs makes diagnostic imaging very suggestive. Residual cholelithiasis and pneumobilia can be confirmed by ultrasound (USG) of the liver and bile ducts. The sum of a radiographic and ultrasound study increases the sensitivity to 74%. Abdominal computed tomography (CT) with water-soluble contrast medium is the study of choice, since it has a sensitivity greater than 90% and specificity of 100%, it also allows ruling out other etiologies of intestinal occlusion, such as flanges, internal hernias, tumors, etc. [10] Initial treatment is based on fluid resuscitation, analgesic control, correction of fluid and electrolyte imbalance, and control of existing comorbidities. Conservative management has a success rate of approximately 7%. [7] Generally, a definitive surgical management is carried out, the intervention can be carried out in two stages by means of the extraction of the impacted biliary stone with enterolithotomy and enterorraphy, to resolve the mechanical intestinal occlusion and later cholecystectomy or cholecystostomy with the repair of the bilioenteric fistula or in perform the 2 procedures at the same time, however, this last modality is associated with higher morbidity and mortality. [1] The most common postoperative complications are acute kidney injury, urinary tract infection, ileus, infection, and wound dehiscence. [2] The surgical procedure and approach. whether open or laparoscopic, is determined by the clinical status of the



Figure 2. USG of liver and bile ducts: chronic lithiasic cholecystitis and a 5.4 cm gallstone.

patient, taking into account cardiorespiratory and metabolic stability, as well as comorbidities, surgical risk, and the skill of the surgeon.

Case report

63-year-old female patient with the following history: grade 2 obesity, 3-year history of cholelithiasis, patent ductus arteriosus ligation in childhood, a cesarean section at 30 years of age, and positive transfusions, with no adverse reactions. Onset 6 days prior to hospital admission after ingestion of cholecystokinetic foods with pain in the epigastrium, right hypochondrium and colicky mesogastrium, intensity 9/10 on the visual analogue scale, associated with nausea and vomiting of gastric content at a rate of 3 -5 vomiting per day, in addition obstipation and absence of gas channeling, for which he selfmedicated with omeprazole 20 milligrams every 12 hours, ondansetron 8 milligrams every 8 hours and pinaverium / dimethicone 100/300 milligrams every 12 hours orally, without symptom referral for which he went to the emergency department. Physical examination was oriented, cooperative, dehydrated mucosa, nasogastric bypass tube with little intestinal cardiopulmonary without content. alterations. abdomen with distension, hyperactive peristalsis with metallic noises, tympanic percussion, soft palpation, depressible, with generalized pain, positive rebound, without tumors or plastrons. Extremities with capillary filling of 2 seconds and distal pulses 2/2. Laboratory studies: leukocytes 10.72 x 10 3 / µl, neutrophils 8.41 $10.3 / \mu$ l, hemoglobin 15.8 g / dl, platelets 217 x 10.3 / μ l, glucose 213 mg / dl, creatinine 0.91 mg / dl, sodium 135 mEq / L , potassium 3.9 mEq / L, chlorine 3.9 mEq / L, TP 10.9 sec, INR 1.08, APTT 21.6 sec, blood gas: PH 7.43, pCO2 40 mmHg, pO2 41 mmHg, HCO3- 26.5 mmol / L, EB 2 mmol / L, lactate 1.7 mmol / L. Standing and decubitus abdominal radiographs were initially performed (Figure 1A-B) in



Figure 3A and 3B: Contrast abdominal CT scan. Axial and coronal section, respectively, in which a 29.8 x 26.7 mm biliary stone in the jejunum is observed with retrograde dilation of the small intestine loops of up to 3.7 cm with adequate enhancement of the walls when the contrast medium passes, intestinal pneumatosis, engorgement mesenteric vessels and free fluid interase.

which dilation of the loops of the small intestine was observed with air-fluid levels and pneumobilia (Gotta-Mentschler sign). Therefore, in addition to a 2-year previous USG report of the liver and bile ducts with chronic lithiasic cholecystitis and a 5.4-cm gallstone (Figure 2), it was decided to perform a contrasted abdominal CT in which a digestive biliary fistula was found, with a biliary stone in the terminal jejunum measuring 2.9 x 2.6 cm, retrograde dilation of the small intestine loops of up to 3.7 cm with adequate enhancement of the walls to the passage of the contrast medium, however with intestinal pneumatosis, engorgement of the mesenteric vessels and fluid free interase, all the above in relation to gallstone ileus with data suggestive of intestinal ischemia (Figure 3A and 3B). Under the consent of the patient, it was decided to perform laparoscopic surgical management. With the patient in the supine position, 4 trocars were placed, 1 umbilical trocar of 10 mm for the optics and 3 trocars of 5 mm for working forceps in both iliac and left hypochondrium (Figure 4A). fossae Diagnostic laparoscopy was performed in which the following findings were reported: inflammatory reaction fluid, liver with data of macronodular cirrhosis and omentum plastron over gallbladder; jejunal loop 1.5 m from the Treitz ligament with a 2 x 3 cm gallstone that caused dilatation of the intestinal loops in a retrograde manner of up to 4 cm, which had adequate coloration and peristaltic movements (Figure 4B). A systemic revision of the remaining intestine was carried out and, upon finding a single jejunal lithasis, a longitudinal enterotomy was performed on antimesenteric border intracorporeally the and immediately proximal to the stone using monopolar energy of approximately 4 cm. By means of proximal enterotaxy, the mechanical extraction of the gallstone was performed (Figure 4C and 4D), later the enterorraphy was carried out transversely in two planes by means of continuous surge and invaginant Lembert suture. The procedure was completed without incident after a surgical time of 100 minutes, and a

bleeding of 20 milliliters was quantified. A closed Blake-type drain was placed with an outlet in the port of the right iliac fossa. Oral feeding was started 12 hours after the surgical event showing adequate tolerance, as well as evacuations at 48 hours, the drainage was removed with a quantified output of 75 milliliters of serohematic appearance in 48 hours and the patient was discharged on the third day without complications.

Discussion

Gallstone ileus is a rare disease that can be explained by the increasing number of laparoscopic cholecystectomies annually. Surgical resolution of this entity was chosen to use a laparoscopic approach due to the advantages of a minimally invasive surgery in elderly patients with associated diseases compared to an open approach, which, as Mondragon et al. published, has high morbidity (20 % to 57.5%) and mortality (7% to 18%), making it a safe treatment option. However, although it is successful, this approach is not exempt from conversion with a report of 11 to 45%.

Management by laparoscopic enterolithotomy was decided as the exclusive therapy in the first surgical stage to reduce morbidity and mortality, taking into account that mortality is estimated at 11.7% in those who underwent two-stage surgical treatment compared to 16.9% in those operated on in just one weather ; In addition, with this management the risk of recurrence is 5% and the probability of developing gallbladder carcinoma is reduced with reports ranging from 1% to 15%. [1,11]

The surgical approach and procedures need to be individualized based on the patient's condition and the surgeon's training. There are few comparative studies on the approach to gallstone ileus due to the infrequency of the disease, being these limited to small series of cases accumulated in several decades with differences in the diagnostic route and operative management, however, the superiority of the laparoscopic approach with shorter surgical time, less postoperative pain, shorter hospital stay, early mobilization with the return to normal activity, cosmetic wounds and fewer serious complications demonstrated by Moberg et al.

Conclusion

Gallstone ileus is a rare disease, however, a high index of suspicion should be had in patients with intestinal obstruction and a history of cholelithiasis; in which it is important to confirm the diagnosis through imaging studies to plan timely treatment and have better results. The choice of the surgical procedure in Ávila-Lamadrid PG et al.



Figure 4. A Wounds of ports used for laparoscopic approach. B. Biliary stone in the jejunal loop 1.5 m from the Treitz ligament with retrograde dilatation of the intestinal loops of up to 4 cm. C and D. Enterotomy with extraction of a 2 x 3 cm gallstone.

one or two stages depends on the global assessment of the clinical status of the patient, the comorbidities and the surgical risk, however, the resolution in a time by extraction of the biliary stone with enterolithotomy and enterorraphy, plus cholecystectomy or cholecystostomy with bilioenteric fistula repair, it is associated with higher morbidity and mortality, so two-stage management is preferred. On the other hand, the minimally invasive approach in well-selected patients and performed by a surgeon with training in laparoscopy leads to benefits and advantages such as shorter surgical time, less postoperative pain, shorter hospital stay, early mobilization with return to normal wounds esthetic and fewer activity, serious complications compared to the open approach.

Conflicts of interests

There was no conflict of interest during the study, and it was not funded by any organization.

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