Introduction

The biliodigestive fistula is not a rare affection in the context of acute pathology of the gastrointestinal tract. The main cause is chronic recurrent cholelithiasis (1). Other causes are the perforation of a duodenal ulcer into the biliary tree (2, 3), and a neoplastic infiltration starting from the biliary tree or gastrointestinal tract. Rarely the causes could be echinococcus cysts, liver or renal abscesses, Caroli’s disease, penetrating trauma or necrotic colitis.

The abnormal communication that has been created, causes an alteration of the biliary physiology. Pressure gradient between bowel and biliary tree determines bile reflux into the duodenum, or enteric content into the biliary tract because of the lack of protective mechanism which normally prevent it (Oddi’s sphincter, the oblique insertion of the common bile duct in the context of duodenal wall and Caroli’s phenomenon) (4).

The 1 to 3% of cases present gallstone ileus as complication (5-7). Gallstone ileus is a kind of mechanical bowel obstruction caused by the passage of one or more gallstones from biliary tree to the intestinal lumen, through...
the fistula. These concretions increase their volume during the passage into the bowel, because of the addiction of enteric content, until they are stopped in the last part of the ileum (when their diameter exceeding 2.5 cm).

The diagnosis is difficult (8). Surgical treatments may be in one-stage or two-stage. Many studies seems to prefer the deferred definitive treatment.

Case reports

Case 1

A woman 81 years old, with history of renal lithiasis for 30 years, who presented pain in the right lumbar region for 10 days. She referred a chronic pain in the right hypochondrium from the night before the admission, and mild fever. Alvus closed both to feces and gas.

The abdomen was moderately distended and particularly painful to the deep palpation of right hypocondrium and hip. Murphy signs was positive. Peristalsis was present and valid. Blood tests showed a neutrophilic leukocytosis (WBC 19.15, Neu 86.99%); the increase of cholestasis indices: total bilirubin 6.60, direct bilirubin 4.50, ALP 221); cytolisis indices altered (GOT 314, GPT 508, LDH 262); RPC 25.

The US of the abdomen showed fatty liver with increased volume, plurilithiasic gallbladder with biliary tree not dilated. X-Ray in supine position showed some air-fluid levels. Because of the persisting pain, a new US was performed which confirmed the presence of cholecystitis (a plurilithiasic gallbladder with thickened wall).

A colangio-TC with contrast showed the irregular thickening of the gastric body wall and of the antrum; the piloric portion and the first part of duodenum were stuck to the back surface of the gallbladder containing some gallstones were poorly dissociable from it. Moreover in the gallbladder lumen there was an air-fluid level suggestive for a biliodigestive fistula. There were also two serous collects, one of its located along the falciform ligament and the second one (5x2 cm) located into the Morrison; there was edema of the pericholecystic tissue. Enterolithotomy, biliary reflux and the presence of bile inside the stomach associated with gastritis.

Given the slight clinical improvement and the blood tests, the patient refused surgical procedures and she was discharged against medical opinion.

Case 2

A woman 74 years old, with history of pain at the right hypochondrium for 2 months, irradiated to the right shoulder. The US showed a caudate lobe hypertrophy, lithiasic stretched gallbladder, with thickened walls. There was a gallstone (11 cm in diameter) in the biliary tree, wedged into the papilla.

Biliary tree and common bile duct were dilated. An ERCP was performed with sphincterotomy, clearance of biliary tree, realizing of two gallstones and biliary mud.

The patient was discharged because of the regression of symptoms, and the intervention delayed. During the subsequent surgery, multiple cholecysto-colic and cholecysto-gastric strong adhesions were found, due to the presence of a cholecysto-gastric fistula.

We performed the repair of the fistula, a gastroplasty and cholecistectomy in one-stage.

Post-operative course was regular and the patient discharged on day X.

Case 3

A woman 13 years old, who complained chronic abdominal pain for a week, associated to bilious vomiting, alvus closed both to feces and gas. The abdomen was characterized by soreness and tenderness to the palpation, then not very treatable. Peristalsis was present. Blood tests showed a neutrophilic leukocytosis (WBC 12).

X-RAY of the abdomen showed an air-fluid level.

CT-scan of chest and abdomen detected the presence of air at the level of hepatic hilum and the second portion of duodenum.

In the pelvic region there is a dilated bowel loop with thickened walls, that contents a target shaped formation, likely nature of gallstone. The gallbladder was not displayed both to CT and US. A bowel obstruction caused by a gallstone ileus was diagnosed with the indication for an urgent intervention. At laparotomy, the small intestine appear dilated and congested: at a distance of 15 cm from the ileo-cecal valve there was a swelling of 6 cm in diameter with hard-wood consistence, occluding the lumen of the loop. Under the liver there was a scar tissue area including the visceral surface of the liver, the first and the second portion of duodenum. The gallbladder was fibrotic, retracted and completely incorporated by the inflammatory tissue. Enterolithotomy, cholecystectomy and cholecysto-duodenal fistula repair were performed in one-stage procedure.

Post-operative course was regular and the patient discharged on day IX.

Case 4

A man 50 years old, without significant past medical history, referred abdominal pain for a week in epigastrium and right hypochondrium, associated with nausea and vomiting. Alvus closed both to feces and gas for 4 days. At the physical examination the abdomen was not very treatable, sore and tender both to the superficial and deep palpation. Peristalsis was torpid with me-
Biliodigestive fistulae and gallstone ileus: diagnostic and therapeutic considerations. Our experience

tallic sounds to the auscultation. Blood tests showed a mild neutrophilic leucocytosis. X-Ray highlighted the presence of an extended intestinal loop, shaped as an inverted U, and some air-fluid levels in the right quadrant of the abdomen.

A thoracic-abdomen urgent CT-scan showed a non-homogeneous hypodense area at the hepatic hileum, which included a thickened duodenal loop; the gallbladder was poorly visualized.

Multiple air-fluid levels can be detected at the jejunoleal, and into the pelvic can be observed an intestinal loop with thickened wall containing liquid and a target shaped formation, likely a gallstone.

It was diagnosed a gallstone-ileus and cholecysto-duodenal fistula, with the indication to the urgent intervention. At the opening of the peritoneum, the intestinal loops appeared strongly dilated and congested. At a distance of 15 cm from the iléo-cecal valve there was a swelling of 2.5 cm in diameter occluding the lumen. The gallbladder appeared inglobated by the scar tissue, and strongly stocked to the upper margin of the first portion of duodenum. Cholecystectomy and fistula repairing have been carried in one-stage. Post-operative course was regular. The patient discharged on XIV day.

Discussion

Preoperative diagnosis of BDFs is very difficult because of the lack of signs and symptoms (4, 9, 10, 11). When a gallstone ileus is present, it is possible to find the Rigler triad signs, such as aerobilia, air-fluid levels, and ectopic calculi (10, 12). However this triad of signs could be found only in the 4-35% of the cases.

The delay in diagnosis and intervention influence negatively the mortality and morbidity. An accurate diagnosis is done only in the 35% of the cases with a late of 1 to 10 days.

The key role in the pre-operative diagnosis is given to the diagnostic imaging.

X-ray shows the presence of gas in the biliary tree with the peculiar Y-shaped configuration, and the presence of air-fluid levels (4, 11, 13, 14). The US is useful for the study of biliary tree and sometimes for the detection of gallstones migrated to the bowel with accuracy of 90% and high specificity. But US is not so useful for the study of the fistula (15). CT-scan with contrast is the gold standard to allow the correct pre-operative diagnosis: it identifies the three Rigler signs, when present, moreover it is able to identify the fistula thanks to the contrast (16, 17). Surgical options include: a simple enterotomy with extraction of the calculus; the addiction of a cholecystectomy with fistula repair. The treatment could be performed in one-stage or deferred (two-stage) (18-20). Simple enterolithotomy seems to reduce the operative mortality and morbidity if compared with the one-stage procedure. However, it presents some complications, such as recurrent gallstone ileus, cholecystitis and cholangitis, at least an increasing risk of cholangiocarcinoma. Therefore, it seems that this procedure has been abandoned. But the association of cholecystectomy and fistula repair causes the increasing of operative time and so an higher risk of biliary or enteric leakage, especially in old patients with serious disease (ASA III) (21, 22). It is important the careful selection of the patients that will be subjected to the different surgical approaches. Generally, two-stage management is preferred for patients with multiple comorbidities, ASA III. New surgical approaches have been proposed for the resolution of the gallstone-ileus: minilaparotomy, laparoscopy or VLS-assisted enterolithotomy, shockwave lithotripsy, lithotripsy with Nd:YAG laser (15, 23). The VLS-assisted enterolithotomy is recommended for diagnosis and therapy; moreover it is associated with a low rate of mortality and morbidity, even in old and debilitated patients, ASAIII (24, 25).

Conclusions

The diagnosis of biliodigestive fistulae and gallstone ileus is often late because of the lack of pathognomonic signs and symptoms. This leads to an increase of mortality and morbidity. CT-scan is the gold standard for the diagnosis, and our experience confirms it.

Clinical conditions of the patients influence the choice of the suitable surgical intervention.

Two-stage treatment is less risky, specially for patients with multiple comorbidities, ASA III.

In our experience, while considering the deferred treatment the best one, in view of a tailored surgery, we decided to choose each time the most suitable treatment. Moreover we would also underline that is important to consider the biliodigestive fistula in the differential diagnosis.

References

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