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COMPLEX INTRAHEPATIC LITHIASIS: A CASE STUDY ON BILIARY EXPLORATION AND BILIODIGESTIVE BYPASS

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Abstract: Cholelithiasis, the presence of stones in the gallbladder, is the most prevalent disease of the biliary tract, affecting approximately 15% of the population. Its complications include cholecystitis, choledocholithiasis, and biliary pancreatitis. Intrahepatic lithiasis, less frequent in the West (0.6-1.3%), involves stones in the bile ducts within the liver and can cause bile duct stenosis, cholangitis, liver abscess, biliary cirrhosis, portal hypertension, and cholangiocarcinoma. The goal of treatment is to remove the stones and the associated infection, reduce the possibility of recurrent lithiasis, and avoid the risk of malignant transformation in cases with significant dilatation of the bile ducts. Initial treatment is endoscopic, with removal of stones in 75% of cases. However, complex presentations such as large dilatations in the bile ducts, intrahepatic lithiasis, and large stones present a challenge in terms of approach and control of complications. The case reported is of a 67-year-old female patient with pain in the right hypochondrium and cholestatic syndrome, diagnosed with choledocholithiasis, intrahepatic lithiasis and biliary tract dilation. After failed endoscopic attempts to remove the stones, surgical treatment was indicated due to the persistence and complexity of the condition. Cholecystectomy, exploration of the biliary tract and biliodigestive diversion with Roux-en-Y hepaticojejunostomy were performed to ensure adequate drainage and prevent complications such as biliary stasis and infections. The surgical approach ensures complete removal of the stones and reduces the risk of serious complications associated with intrahepatic lithiasis and choledocholithiasis. Biliodigestive diversion is indicated in selected cases and involves anastomoses such as choledochoduodenostomy and hepaticojejunostomy. We suggest hepaticojejunostomy as a preferential option because it minimizes the risk of sump syndrome and infections, as

well as fewer complications associated with jejunal fistulas compared to duodenal fistulas.
Keywords: Complex Calculi; Hepatolithiasis; Intrahepatic Lithiasis; Biliodigestive; Roux-en-Y Hepaticojejunostomy

INTRODUCTION

Cholelithiasis is defined as the presence of stones in the gallbladder and is the most prevalent disease of the biliary tract, affecting approximately 15% of the population. In Brazil, 9.3% of the population over 20 years of age has cholelithiasis and over 65 years of age this prevalence reaches 30%.

Among the complications of cholelithiasis are acute and chronic cholecystitis and their complications, choledocholithiasis, cholangitis, biliary pancreatitis and Mirizzi syndrome.

Intrahepatic lithiasis is the presence of stones within the bile ducts, proximal to the right and left hepatic ducts, regardless of the presence of stones in the gallbladder and/or common hepatic duct. The disease is not common in the Western world, with a prevalence of 0.6-1.3% and different causes have been observed.

Intrahepatic lithiasis is associated with complications such as bile duct stenosis, acute cholangitis, liver abscess, liver atrophy, secondary biliary cirrhosis, portal hypertension and liver failure. In addition, it is an important cause of intrahepatic cholangiocarcinoma.

CASE REPORT

A person called: F.D, female, 67 years old, hypertension, seeks care due to repeated episodes of pain in the right hypochondrium associated with cholestatic syndrome for 5 months. She underwent an abdominal ultrasound suggesting choledocholithiasis with dilatation of the common bile duct and bile ducts. Endoscopic retrograde cholangiopancreatography (ERCP) was then performed, without success in completely removing the stones, and a bile duct prosthesis was placed.

After 3 months, she underwent a new ERCP, which identified spontaneous migration of a previous biliary prosthesis, dilatation of the intra and extrahepatic bile ducts, a common bile duct measuring 18 mm, presence of choledocholithiasis and intrahepatic lithiasis. Papillotomy and placement of a new plastic biliary prosthesis were performed, but with no success in achieving complete clearance of the bile duct.

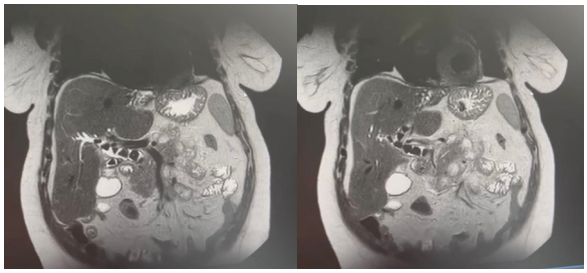
Cholangiography showed a liver with reduced volume in the left lobe and steatosis, dilation of the intrahepatic bile ducts, notably in the left lobe, with filling defects suggestive of lithiasis measuring up to 1.5 cm in the proximal hepatic branches, common bile duct, gallbladder and cystic duct (Figures 1 and 2). Heterogeneous and ill-defined peripancreatic collection involving its body and tail, associated with blurring and edematous infiltration of the adjacent fat, suggestive of pancreatitis.

For the second consecutive failure in the attempt at endoscopic treatment for complete removal of the stones and due to significant dilation of the bile ducts, a surgical approach was indicated with a proposal for exploration of the bile ducts and biliodigestive diversion with Roux-en-Y hepaticojejunostomy.

The patient underwent laparotomy. The cavity inventory identified a dilated common bile duct measuring approximately 2 cm, a diffusely hardened pancreas with signs suggestive of previous pancreatitis, and no collections. Small areas compatible with atrophy in segments II and III of the liver were also identified. Cholecystectomy and exploration of the bile ducts were performed with extraction of stones. Irrigation of the bile ducts was performed to remove intrahepatic stones, and intraoperative cholangiography confirmed the absence of remaining stones

(Figure 3). Due to the significant dilation of the bile ducts, a biliodigestive bypass with Roux-en-Y hepaticojejunostomy was chosen (Figure 4).

In the preoperative preparation, the possibility of performing a left lateral sectorectomy was considered, but due to the patient's age and desire, it was decided not to perform liver resection and to follow up with regular exams. The patient was discharged on the fifth postoperative day asymptomatic. She is being monitored as an outpatient.



Figures 1 and 2: Cholangiography showing bile duct and proximal hepatic branches.

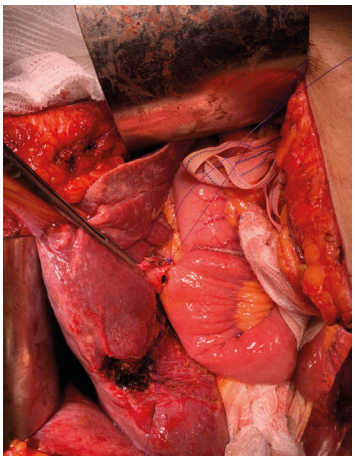


Figure 3: Intraoperative cholangiography

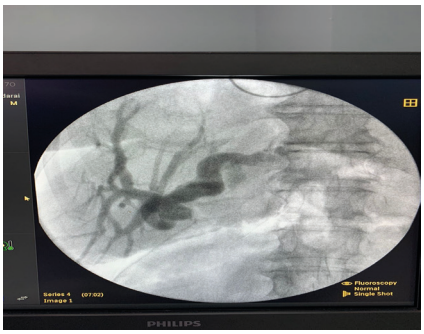


Figure 4: Roux-en-Y hepaticojejunostomy

DISCUSSION

Choledocholithiasis occurs, in most cases, due to the migration of gallstones from the gallbladder to the main bile duct. It is estimated that approximately 10% of patients with cholelithiasis have choledocholithiasis. However, the formation of primary stones in the bile ducts can occur, especially in patients who have undergone previous cholecystectomy or endoscopic stone extraction.

Similarly, hepatolithiasis can be classified as primary or secondary. Primary hepatolithiasis is defined when the stones are formed in the liver and may be associated with local dilation and stenosis of the bile duct. Secondary hepatolithiasis is caused by stones that originally formed in the gallbladder or common hepatic duct and then migrate to the liver. Lithiasis is more common in the left lobe, probably due to the more acute angle between the common hepatic duct and the left hepatic duct, which could induce bile stasis. Although it may be asymptomatic, patients often present with pain in the right hypochondrium, which may be associated with nausea and vomiting, accompanied by jaundice, choluria and acholic stools. In laboratory tests, it is associated with increased bilirubin, ALP and GGT. Abdominal ultrasound is an easily accessible test that confirms the diagnosis in most cases of choledocholithiasis. Cholangiography and echoendoscopy can complement the investigation if diagnostic doubts remain or in complex cases, such as intrahepatic stones. Hepatolithiasis and choledocholithiasis must always be treated due to the risk of complications. The aim of treatment is to remove the stones and the associated infection, reduce the possibility of recurrent lithiasis and avoid the risk of malignant transformation in cases with significant dilation of the bile ducts.

If the diagnosis is made before removal of the gallbladder (cholecystectomy), the method of choice will be endoscopic papillotomy/

sphincterotomy (ERCP), a non-surgical treatment that can remove all stones in 75% of patients and is considered the gold standard method in the treatment of choledocholithiasis.

Stones larger than 15 mm, bile duct-calculus disproportion, stones associated with stenosis, intrahepatic stones, stones in patients with altered anatomy and Mirizzi syndrome are considered complex stones and are difficult to remove. ERCP is not free of complications, which occur in approximately 6.9% of patients and include pancreatitis, bleeding, pain and abdominal distension after the procedure, cholangitis, perforation and intussusception of the common bile duct.

In cases of failure to remove stones, a biliary prosthesis is necessary to promote drainage of the bile duct, and a new procedure must be performed within 3 months. It is believed that the use of plastic or metal prostheses facilitates the removal of stones in the second approach due to the friction of the prosthesis with the stone, which causes fragmentation or reduction in its size. After failure in the second or third attempt, or especially when the multidisciplinary team believes that it will not be possible to completely remove the stones endoscopically, surgical treatment is the best option. In 2006, single-operator cholangioscopy, SPYGLASS®, was described as an alternative approach in cases of failure to remove stones by ERCP, in which it is possible to perform lithotripsy of the stones, either by laser or electrohydraulic, endoscopically. Although it has advantages as a less invasive technique, it is still a reality for few patients due to its high cost and the need for an experienced professional.

Surgical removal can be performed via transcystic or choledochotomy, and can be performed openly (laparotomy) or laparoscopically, in conjunction with cholecystectomy. The laparotomic approach is indicated in cases of greater technical complications or in the absence of a surgeon trained in laparoscopic exploration.

The management of intrahepatic lithiasis requires the complete removal of all stones, bile duct stenosis, if present, and adequate drainage of the affected segment of the bile duct to the small intestine. Liver resection reduces the risk of recurrence and prevents complications such as secondary biliary cirrhosis, suppurative cholangitis, portal hypertension and liver failure.

Bliodigestive diversion is indicated in cases of intrahepatic stones, stenosis of the sphincter of Oddi and primary choledocholithiasis. Furthermore, it may be indicated in cases where recurrence is frequent, with risk factors being conditions that cause biliary stasis, such as bile duct dilation greater than 15 mm or anatomical alterations (periampullary diverticulum, bile duct angulation, and strictures). The bile duct must be dilated for the procedure.

Among the biliodigestive anastomoses, the most frequently used is the side-to-side choledochoduodenostomy. However, the dysfunctional distal bile duct acts as a blind pouch, causing accumulation of food material and biliary stasis, leading to the formation of stones. In the long term, this can lead to infectious episodes such as ascending cholangitis and sump syndrome.

An alternative to avoid this complication is the use of bile duct anastomosis with an exclusive jejunal loop. The Roux-en-Y biliary-digestive anastomosis prevents food debris from entering the bile duct and removes the distal common bile duct from contact with bile.

A frequent postoperative complication in biliary-digestive bypasses is fistulas. Duodenal fistulas are highly morbid and have a high output with significant hydroelectrolytic and bicarbonate loss, leading to significant metabolic acidosis. Jejunal fistulas tend to present a more benign behavior, with low

output, including the possibility of oral nutritional approach and spontaneous closure.

Therefore, we use biliary-digestive bypass by means of Roux-en-Y hepaticojejunostomy as the anastomosis of choice.

CONCLUSION

Since cholelithiasis is the most prevalent disease of the bile ducts, it is extremely important to understand its complications and how to manage them.

In cases of choledocholithiasis and intrahepatic lithiasis, treatment is necessary to completely remove the stones, especially due to the risk of potentially serious complications, such as pancreatitis, cholangitis and even the risk of malignancy in cases of significant bile duct dilation and stasis.

Endoscopic treatment is the initial method of choice; however, in complex cases where there is therapeutic failure, a surgical approach may be necessary. In this case, laparoscopic or laparotomic exploration of the bile ducts is the approach of choice.

Bliodigestive diversion is indicated in selected cases and a dilated bile duct with a common bile duct greater than 15 mm is required for the technique to be performed. Choledochoduodenostomy and choledochojejunostomy are the main anastomoses performed. Due to the lower risk of sump syndrome, ascending cholangitis and lower complications of possible jejunal fistulas, we suggest choledochojejunostomy or Roux-en-Y hepaticojejunostomy as the anastomosis of choice.

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