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Case Report

Open bile duct exploration as a therapeutic solution for difficult to manage choledocholithiasis: a case report

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ABSTRACT

The most common etiology of bile duct obstruction in patients with cholelithiasis is choledocholithiasis. The diagnosis of cholelithiasis is based on clinical suspicion and confirmed by ultrasound (US) of the liver and bile ducts. The management of bile duct lithiasis has evolved considerably and currently, ERCP is the most common and recommended technique. However, in cases of multiple lithiases, fragmentation of the lithiasis during extraction, excessive preoperative or transoperative handling of the ampullary region, previous stenosis of the ampullary region, juxtapapillary diverticula, primary bile duct stones, or residual intrahepatic stones, a large number of hospitals do not have sufficient resources to perform minimally invasive procedures and offer these therapeutic alternatives instead.

Keywords: Choledocholithiasis, Bile duct exploration, Endoscopic retrograde cholangiopancreatography, Laparoscopic cholecystectomy

INTRODUCTION

Choledocholithiasis is a pathology that consists in the presence of stones in the common bile duct, these stones come mainly from the gallbladder and between 10 to 15% of cases occurs in patients who present cholelithiasis.[1] Likewise, this pathology is the main cause of acute pancreatitis and cholangitis. According to its origin, choledocholithiasis can be divided into: primary, secondary and residual.

Primary choledocholithiasis was defined by Saharia et al in 1977 as that which occurs in a patient with at least two years cholecystectomized (with or without bile duct exploration), time in which the patient has remained asymptomatic and with absence of elongated cystic remnant or biliary stenosis; this represents between 4 to 14% of cases.[2] Secondary choledocholithiasis is one in which there is a migration of litus from the gallbladder to the common bile duct and represents 86 to 96% of all cases.[2] Finally, residual choledocholithiasis refers to the presence of stones within the bile duct during the first two years after a cholecystectomy, it is estimated that this represents 5 to 12% of cases.[3] Although there is no definitive consensus, to consider that a litus is large, the diameter of 15 mm is taken as a reference.[4] The following was the case of a patient who was initially treated with ERCP and laparoscopic cholecystectomy and subsequently required an open examination of the bile ducts. Based on the experience of this clinical case, a literature review was carried out on the concept of residual choledocholithiasis of large elements.

CASE REPORT

A 48 years old male patient, with no clinical or surgical history, began his condition 3 months ago with abdominal

pain of intensity 7/10, jaundice in the mucous membranes and pruritus. No nausea, vomiting, or fever.

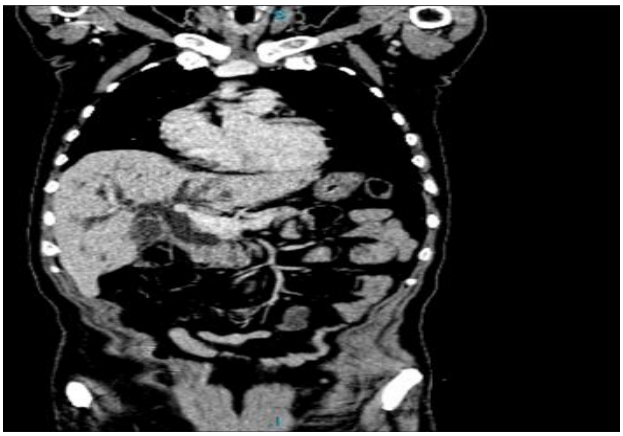

Figure 1: CT, in which hepatomegaly was observed, as well as dilation of the intra-and extra-hepatic bile duct.

He was diagnosed with hepatitis of viral etiology and began treatment with analgesics, diet and rest. However, during the next 40 days the patient presented unintentional weight loss of 15 kg, insomnia, jaundice, loss of appetite and asthenia. Upon admission to the emergency department, cabinet studies and a contrasted thoraco-abdominal tomography were requested, in which hepatomegaly was observed, as well as dilation of the intra-and extra-hepatic bile duct (Figure 1).

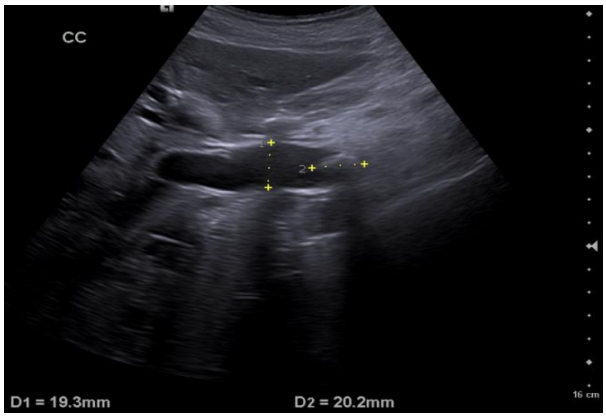

Figure 2: US that shows dilation of the common bile duct of 19 mm with an ovoid, defined, echogenic image of 20 mm located inside it.

Subsequently, an ultrasound of the liver and bile ducts was requested, which reported dilation of the intra-and extra-hepatic bile ducts, 19 mm common bile duct with an ovoid, defined, echogenic image of 20 mm located inside it, specifically in the intrapancreatic segment (Figure 2), gallbladder 59×27 mm, wall 3 mm. the initial laboratories were leukocytes: 7.55 mm^3, neutrophils: 66.2%, hemoglobin: 13.9 g/dl, hematocrit: 40.6%, platelets: 3,26,000 mm^3, glucose: 375 mg/dl, urea: 24.1 mg/dl, creatinine: 0.9 mg/dl, sodium: 125 meq/l, potassium: 4.44 meq/l, chlorine: 89.2 meq/l, direct bilirubin: 21.8 mg/dl, ALT 105.9 U/l, AST 119.9 U/l TP: 14.1 sec, TPT: 31.4 sec, INR: 1.25. The patient was admitted to the general surgery floor where he was consulted with the endoscopy service, performing ERCP and reported the presence of a litus of approximately 30 mm (Figure 3).

Figure 3: Endoscopic sphincterotomy of the ampulla of Vater.

A hydroelectrolitotripsia was performed, followed by 2 sweeps and balloon dilation in which, under fluoroscopic control, a bile duct was observed without filling defects. The patient presented an adequate evolution, tolerance to the liquid diet and 24 hours later tolerance to soft diet so he was discharged from the hospital to continue with differentiated surgical management.

Two days after discharge, the patient goes back to the emergency department for pain in the right hypochondrium region, intensity 10/10, irradiation to the epigastrium, and also presents nausea and vomiting of food content on 1 occasion, which occurs after food intake. Clinical findings showed poor general condition of the patient, abdominal pain with hepatomegaly, persistence of icteric tint and the following vital signs were recorded: temperature: 36.7°C, heart rate: 92 beats per minute, tachypnea (20 breaths per minute), blood pressure: 70/40 mmHg.

Requested laboratory studies of control that report the following results: WBC: 28.35 mm^3, neutrophils: 88.8%, hemoglobin: 10.8 g/dl, hematocrit: 31.9%, platelets: 3,58,000 mm^3, glucose: 159 mg/dl, urea: 18.6 mg/dl, creatinine: 0.6 mg/dl, sodium: 136 meq/l, potassium: 3,69 meq/l, chloride: 95,8 meq/l, blood urea nitrogen: 8,7 mg/dl, direct bilirubin: to 17.9 mg/dl, ALT 56,5 U/l, FA: 824 U/l, total protein: 6 g/dl, albumin: 3,16 g/dl, CK: 24,2 U/l, TP: 14,6 sec, TPT: 34 sec, INR: 1.29.

Crystalloid solutions were administered to improve blood pressure without obtaining an adequate response so we began with aminergic support and antibiotic management of double scheme. A simple CT scan of the abdomen showed a litus at the level of common bile duct, as well as a dilated extra-hepatic bile duct (Figure 4). A new

evaluation was requested by the endoscopy service to perform drainage of the common bile duct.

Figure 4: Abdominal CT showing persistence of intrahepatic and extrahepatic biliary dilation.

A new ERCP was carried out in which it was reported: dilated bile duct, without filling defects and the silhouette of the gallbladder was observed that exerted a valve effect towards the bile duct. The sphincterotome was removed and the extractor balloon was introduced, 4 sweeps were performed and thick biliopurulent liquid was extracted (Figure 5), without the presence of stones, and a 10 FR plastic stent was inserted (Figure 6).

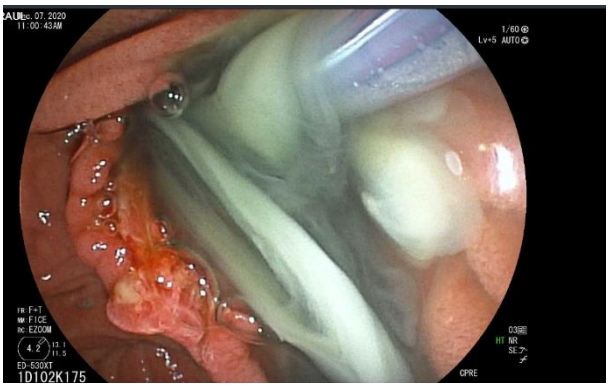

Figure 5: Drainage of biliopurulent material after sphincterotomy.

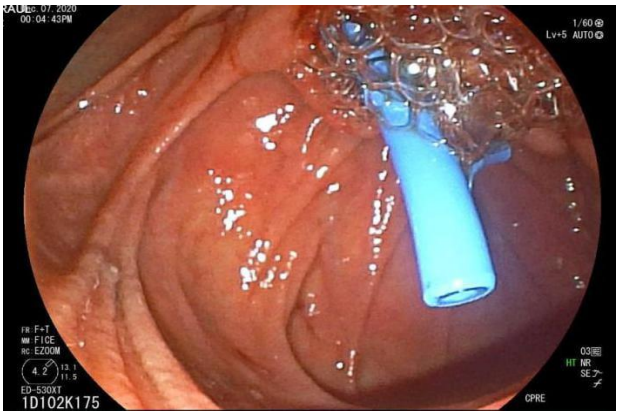

Figure 6: 10 FR biliary plastic stent inserted by ERCP.

According to the findings reported in the second ERCP, it was decided to perform a laparoscopic cholecystectomy in which a micro-nodular cholestatic liver was found with the presence of microabscesses, located gallbladder of 7×4×3 cm. with the presence of perihepatic purulent fluid (approximately 100 cc), thickened wall and multiple lites inside, one of them of approximately 3×3 cm was found impacted in the neck generating compression and dilation of the common bile duct. The patient persisted with elevated inflammatory response cells, as well as a cholestatic pattern and abdominal pain with biliary fluid outflow through penrose drainage.

Due to this, an open examination of the emergency bile ducts was performed, in which it was found: 1000 cc of bile in the cavity, bile leakage at the level of cystic behavior, dysfunctional endoprostesis, so a T-probe was removed and placed that showed detritus exit, while the rest of the abdominal cavity did not present alterations, placing two penrose-type drains, one directed to the hepatic bed and the other to the pelvic floor. Two days after the surgery, the patient presented a decrease in bile by the T-tube and an increase in the output of bile by penrose in the pelvic floor. Cholangiography was performed in which leakage of the contrast medium and a defect in filling in the distal third of the choledochus were observed (Figure 7).

Figure 7: Cholangiography showing filling defect and ovoid image in the common bile duct.

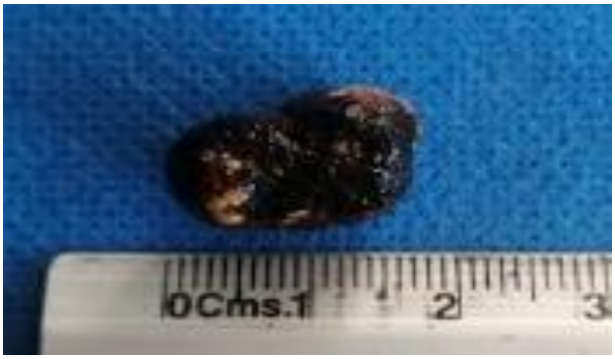

Figure 8: Gallstone of approximately 2×1.5 cm.

We request a new evaluation from the endoscopy service, who perform a third ERCP during which multiple sweeps are performed without extraction of litus, reporting a filling defect in the supraduodenal portion.

Because of this, a new open examination of the bile ducts is performed and the abdominal cavity with approximately 700 cc bilioperitoneum is found, the insertion site of the T-probe is identified, it is removed, the bile duct is explored and a litus of approximately 2×1.5 cm is located in the left hepatic duct (Figure 8), the T-tube is repositioned and cavity closed.

The patient began to present an improvement in general condition and tolerance to the oral route on the second day of the postoperative period. The inflammatory response data, hyperbilirubinemia and the rest of the liver function tests were normalized, so he was discharged with a T-probe to continue his follow-up in the outpatient clinic.

DISCUSSION

In hospitals that have the endoscopy service, the initial management of choledocholithiasis is usually through Endoscopic Retrograde Cholangiopancreatography (ERCP), a technique that was introduced in 1968 by McCune et. at. reporting success in 25% of the cases of cannulation of the ampulae of Vater.[5] Since then this success rate has improved, reaching, for example, 80% success in the clearance of the bile duct and even 89.7% when combined with other tools such as balloon dilation.[6] However, the presence of 'difficult' stones in the common bile duct represents a challenge for this type of therapy. It is considered a 'difficult' lito to those who meet any of the following characteristics: it has a size greater than 1.5 cm, are multiple, has an unusual shape (barrel shape) or has an unusual location.[7]

These characteristics can lead to failed attempts at clearance of the bile duct, so the American Society for Gastrointestinal Endoscopy (ASGE) and the European Society of Gastrointestinal Endoscopy (ESGE) suggest the additional use of techniques such as spyglass and balloon sweeps or lithotripsy as part of the treatment.[7,8] The ASGE guidelines suggest carrying out a sphincterotomy with endoscopic balloon dilation in order to reduce the posterior requirement of mechanical lithotripsy by 30 to 50%.[9] On the other hand, other predictors of failure in endoscopic treatment are: age over 65 years, that the litus is impacted, intrahepatic location, small papilla, bile duct diameter >15 mm.[10]

When lithotripsy with cholangioscopy fails, an examination of bile ducts should be performed, the laparoscopic approach being the most recommended since it has a success rate of 94.2% and a morbidity of 6.5% compared to the open approach that presents a success rate of 95.7% and a morbidity of 12.7%.[11] In spite of the fact that in other countries the open technique has fallen into disuse in our country many hospitals do not have laparoscopy service or doctors do not have adequate training to perform this type of procedures, so the approach through open exploration remains the treatment of choice.[12]

Within the open surgical therapeutic processes are the exploration of bile ducts and biliodigestive derivation. Bile duct exploration is divided into supraduodenal choledocotomy and transduodenal sphincteroplasty. The supraduodenal choledocotomy consists of making a longitudinal incision of 2 cm approximately parallel to the path of the common bile duct, in which a feeding tube can be inserted and thus irrigate inside the duct, increase the pressure and allow the exit of the stones that are impacted naturally or by the same choledocotomy. On the other hand, transduodenal sphincteroplasty is used in cases where the stone is impacted in the sphincter and despite the use of dilators its exit is not achieved, especially if there are adhesions by previous surgeries, papillary stenosis, multiple stones or in cases where the common bile duct is not dilated. In spite of performing an adequate examination of the bile duct and a correct placement of the T-tube, residual litters have been reported in 16% of cases.[13]

Therefore, trans-operative cholangiography should be considered a complementary technique in the procedure since it allows to locate the litus that have not been identified by other methods. Some studies report that this procedure has a sensitivity of 97% and a specificity of 99%.[14] Among the most common complications of the open technique are surgical site infection, biliary leak, bilioma and sepsis.[15]

The examination may conclude with the placement of a Kehr-type tube, as occurred with the patient in the clinical case, or opt for primary closure. Some of the main benefits of this probe are the treatment for residual stenosis, as well as avoiding the increase in intraductal pressure in cases that occur with inflammation of the papilla.[16] However, in certain meta-analyses, such as that carried out by Zhang et al no benefits have been observed from its use, but rather it has been associated with greater complications such as those described by Podda et al which mentions peritonitis, biliary leakage and longer hospital stay.[17,18] Because of this, in recent years its use has been discouraged and primary closure has been chosen.

CONCLUSION

Although the open surgical approach is associated with numerous complications and high morbidity, when we are faced with the persistence of residual lithiasis and failed repetitive ERCP, open bile duct exploration should be considered as a therapeutic option potentially capable of solving such lithiasis through a single surgical gesture. Likewise, the open surgical approach is also a viable option when the hospital does not have the infrastructure to perform a minimally invasive procedure or when the surgeon lacks expertise in the laparoscopic management, since it can prevent the patient is subjected to multiple

failed attempts of endoscopic procedures. This is of vital importance since these failed procedures are not innocuous for the patient, prolong the hospital stay and the associated hospital costs.

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