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Laparoscopic common bile duct exploration and choledochoduodenostomy - A case report

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ABSTRACT

Primary bile duct stones are rare. They are usually secondary to bile stasis and a duct drainage procedure is required during stone removal. Endoscopic sphincterotomy and stone removal is the simplest to perform. In some patients this may fail. For them surgical exploration of common bile duct combined with choledochoduodenostomy is required. The procedure is feasible laparoscopically which results in reduced morbidity.

1. Introduction

Majority of common bile duct (CBD) calculi are secondary to gall bladder (GB) calculi [1]. Primary duct calculi may be with bile stasis [1]. Sphincter of Oddi dysfunction, strictures and choledochal cyst may lead to primary CBD stones. Cholecystectomy, especially when performed at a younger age with resultant duct dilatation may predispose to primary ductal calculi.

The methods available to treat CBD calculi secondary to gall bladder stones are endoscopic duct clearance (ERCP) followed by laparoscopic cholecystectomy or cholecystectomy and CBD exploration at the same setting [2]. The latter may be done by open or laparoscopic approach. ERCP stone retrieval may be done in the operating theatre just before cholecystectomy to reduce hospital stay [2]. Few patients with CBD stones may receive ERCP after surgery mainly for stones detected at surgery by per operative cholangiography [2].

Primary duct stones will need a drainage procedure to prevent recurrence [3]. The patients with diagnosed or suspected sphincter Oddi dysfunction or benign strictures can be treated by sphicterotomy or choledochoduodenostomy [4]. Most are therefore treated by ERCP with sphicterotomy and endoscopic stone extraction. If the stone cannot be extracted by ERCP or if recurrent stones occur choledochoduo-denostomy needs to be considered. This procedure may be done by open surgery or laparoscopy.

We present a seventy-year lady who was treated with laparoscopic CBD exploration and creation of a choledochoduodenostomy laparoscopically.

3. Case history

A seventy-year-old lady investigated for colicky upper abdominal pain and obstructive jaundice was diagnosed to have a CBD stone of 2 x 2 cm with a dilated CBD. The CBD was tapering suggestive of a stricture. GB was free of calculi. Figure 1. There was no convincing evidence of a choledochal cyst.

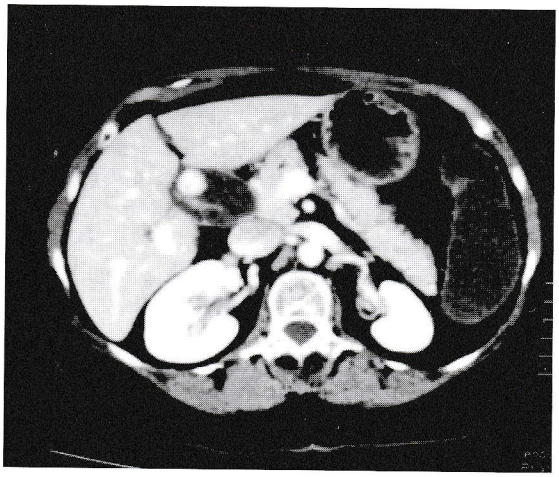

Figure 1-dilated CBD with calculus

At ERCP the ampulla of Vater was normal. Sphincterotomy was performed and cholangiogram showed dilated bile ducts with a tapering end. The stone was floating in the dilated system at the level of common hepatic duct. The stone was too large to be retrieved endoscopically and a stent was left in place to improve drainage.

Repeat ultrasound after a month showed the stone with dilated system.

Laproscopic CBD exploration and choledochoduodenostomy was planned as the duct dilatation persisted in spite of the previous sphincterotomy. At time of surgery examination of the CBD with choledochoscope was planned to rule out malignant stricture. We decided not to perform a cholecystectomy as the GB was functioning and was free of calculi.

2, Procedure

Legs were kept abducted to allow operator to work stationed between legs.

Five ports including camera port was used. The GB was grasped and pushed up to retract liver up. A retractor via the epigastric port was used to provide additional retraction of liver to demonstrate portal structures. The CBD was dissected and a transverse choledochotomy was made. Following suction of bile, the lower duct was milked upwards but no stone was seen. As on all imaging the stone was floating in the common hepatic duct, the head end of table was lifted further and the stone dropped down and retrieved. Irrigation of ducts was done. Choledochoscope was passed via the 10 mm epigastric port and CBD inspected distally through ampulla into duodenum. Subsequently proximal ducts were inspected.

A longitudinal incision was made along the superior border of duodenum and choledochoduodenostomy done using 3/0 polypropylene by continuous suturing, initially posterior layer. Anterior layer was subsequently done with a new suture.

A drain was placed in right subhepatic space. Stone placed in a bag was removed through a 10 mm port entry incision. The operating time was 160 min with a blood loss <50ml.

Patient had an uneventful recovery and did not require narcotic analgesics for post-operative pain.

Discussion

Primary duct stones are usually associated with a stasis in the CBD [1]. Some primary stones may follow cholecystectomy.

When removing the stone, it is necessary to perform a drainage procedure as well [3]. The drainage procedure may be a sphincterotomy or a choledochoduodenostomy [4]. A Roux-N-Y choledocho-jejunostomy is another alternative. It is also important to exclude malignancy as the cause for obstruction. However, it is rare for malignant stricture to present with a CBD stone.

The one with least morbidity is to perform endoscopic sphincterotomy and stone extraction. In this patient an ERCP was performed to exclude malignancy and for stone extraction. At the procedure it was decided that the stone is too big to be retrieved endoscopically. Therefore, a stent was placed to provide decompression until definitive procedure. We decided to wait about one month to assess the degree of duct dilatation. As the bile ducts remained dilated the need for a choledochoduodenostomy was decided to prevent recurrent stones.

The procedure was performed laparoscopically due to its associated lower morbidity. Following stone removal choledochoscopic examination excluded malignancy. Choledochoduodenostomy can be performed by two methods.

1) Anastomosing the duodenotomy to the choledochotomy, side to side, in two layers [4].

2) Those who believe in sump syndrome divide the CBD and perform to an end to side anastomosis [5].

We opted for former as it is quicker and simpler and there is no strong evidence for sump syndrome, which can be managed endoscopically, if it happens. In addition, this patient had undergone a pre-operative sphincterotomy, which would reduce the incidence of sump syndrome. It is traditional to perform the choledochotomy longitudinally and perform the side anastomosis pulling the choledochotomy into diamond shape. We performed the choledochotomy transversely as it is technically simpler.

4. Conclusions

Common bile duct stone extraction and choledochoduodenostomy for primary duct stones can be performed in an acceptable time laparoscopically.

Intraoperative translapaoscopic choledochoscopic examination of bile ducts eliminates the chance of residual stones and excludes malignancy.

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