POST-CHOLECYSTECTOMY MIRIZZI SYNDROME - A RARE COMPLICATION OF LAPAROSCOPIC CHOLECYSTECTOMY DIAGNOSED ON MDCT

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ABSTRACT

Cystic duct calculus could either be due to the retained stone during the cholecystectomy or recurrence of stone in the actual remnant of the cystic duct and causes common duct obstruction by extrinsic compression - Mirizzi syndrome. We report a rare case of post cholecystectomy Mirizzi's syndrome that developed one year after laparoscopic cholecystectomy and our case reminds usefulness of CT scanning, after already inconclusive ultrasound and invasive diagnostic modality ERCP. Stone removal was achieved successfully by traditional laparotomy after the CT scan.

Key words: Mirizzi, Post-Cholecystectomy, MDCT

Introduction

Kehr[1] and Ruge[2] were the first to describe this condition in the early 1900s, although the term "Mirizzi Syndrome" was not adopted until after the work of Mirizzi[3] in 1948. This syndrome is an uncommon complication of chronic gallstone disease.

This condition involves extrinsic compression of the bile duct by pressure applied upon it indirectly by an impacted stone in the infundibulum or neck of the gallbladder.

Anatomical predispositions include side-by-side location of the cystic and common hepatic ducts, coupled with a long, low insertion of cystic duct to the biliary tree.

Post-cholecystectomy residual cystic duct stones have also been implicated in Mirizzi Syndrome.[4,5] and are exceedingly rare, with only few cases reported to date. We present the evaluation and treatment of a unique case of cystic duct remnant calculus causing post cholecystectomy Mirizzi syndrome.

Case Report

A 22-year-old woman presented with a two-day history of epigastric pain, jaundice and fever. One year back she underwent laparoscopic cholecystectomy for recurrent right hypochondrium pain and cholelithiasis. Gall bladder histopathology demonstrated chronic inflammatory changes and multiple fragmented gallstones.

On physical examination, she was tender in the epigastrium, with no palpable mass. Liver function tests (LFTs) showed normal albumin, raised total bilirubin 4.5mg/dL (0.2-1.5), direct bilirubin 2.1 mg/dL (0-0.5) and deranged liver enzymes (normal ranges): alkaline phosphatase 150 iu/L (30-120 iu/L), gamma glutamyl transpeptidase(GGT) 143 iu/L (10-35 iu/L) and alanine aminotransferase (ALT) 274 iu/L (0-40Iu/L). Amylase, urea, electrolytes, full blood count, and coagulation profiles were all normal.

On US, intrahepatic bile ducts (IHD) were dilated with dilatation of extrahepatic duct down to its distal portion

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with sludge in common bile duct. Probability of distal common bile duct obstruction was raised.

Based on this, the decision was made to go for an endoscopic retrograde cholangiopancreatography (ERCP). The ERCP was attempted but failed due to non-cannulation of the common bile duct orifice hence the procedure was abandoned.

Therefore, contrast enhanced CT scans was planned that showed a large calcified density in the region of the porta hepatis. It was causing compression over the confluence of the right and left intra hepatic ducts causing their mild dilatation. It was also associated with minimal enhancement of the surrounding walls. Keeping in view the CT findings possibility of calculus in the cystic duct remnant was raised.

Then patient underwent laparotomy. During operation, the surgeon's utilized intraoperative ultrasonography to clearly define the presence of cystic duct remnant stone. An incision was made directly over the cystic duct remnant and the cystic duct stone was successfully removed. The cystic duct remnant was then closed and a drain was placed in the gallbladder fossa.

The patient was placed on fat restricted diet posto-peratively. No bile leak was detected from the drain. Patient's jaundice disappeared and her LFT returned to normal and the drain was removed prior to dis-charge. She was discharged on third post-operative day and is currently under follow-up in outpatient clinic.

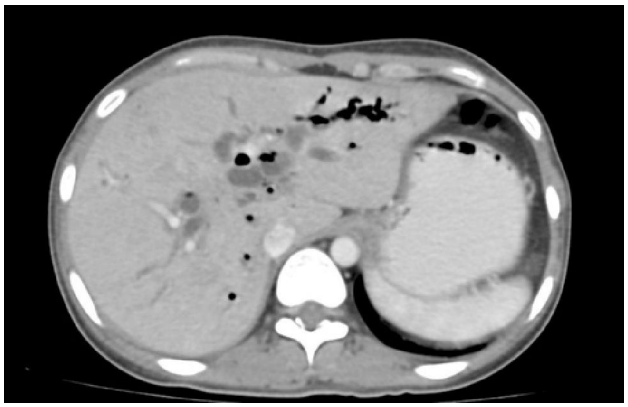
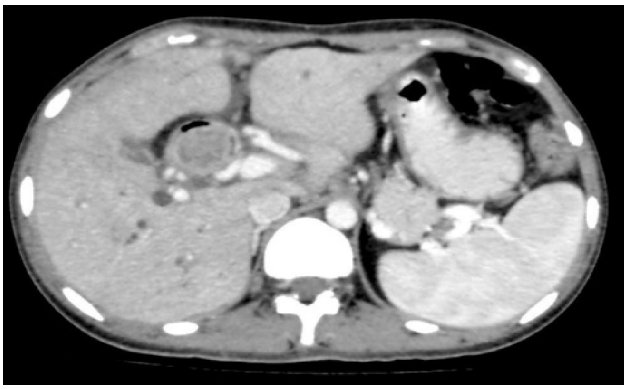


Figure 1: CECT axial image - Dilated intrahepatic bile ducts (IHD) were noted with Post-ERCP air in the biliary system.



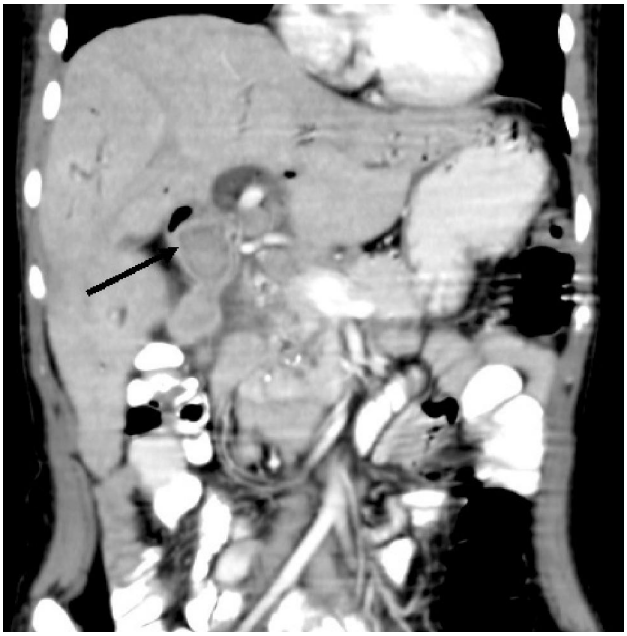


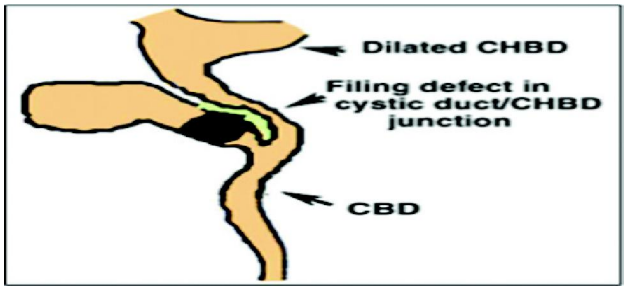
Figure 2 & 3: CECT axial and coronal- Calcified density (arrow) in the region of the porta hepatis. It was causing compression over the confluence of the right and left intra hepatic ducts

Discussion

Post cholecystectomy syndrome (PCS) may be due to biliary stricture, retained or recurrent biliary calculi, stenosis or dyskinesia of Sphincter of Oddi, remnant gall bladder/cystic duct stump calculi, etc. Occluding stones left in the stump of cystic duct may account for 17-25% of cases of PCS.[6] Cystic duct remnant defined as residual duct greater than 1 cm in length. Remnant cystic duct calculus could either be due to the retained stone during the cholecystectomy or recurrence of stone in the actual remnant of the cystic duct.[6] A long cystic duct, which predisposes to the post cholecystectomy stone formation may have a low median insertion into the terminal common duct.

Stone within such a duct may cause common duct obstruction by extrinsic compression called Mirizzi syndrome.

The modern definition of Mirizzi syndrome is thought to include four components: impaction of stone in cystic duct or neck of gallbladder; mechanical obstruction of CHD by the stone itself or secondary inflammation; intermittent or constant jaundice causing possible recurrent cholangitis, and if long standing secondary biliary cirrhosis.



Diagrammatic Presentation of Hepatobiliary system showing, external compression on the common hepatic bile duct (CHBD) caused by impacted biliary stone in the cystic duct remnant.

Reference: Bellamlih H, Zaimi S, Mahi M, Amil T, Chouaib N, Belkouch A et al. Le syndrome de Mirizzi: une cause rare de l'obstruction des voies biliaires: à propos d'un cas et revue de littérature. Pan African Medical Journal. 2017;27.

Mirizzi Type 1, include calculi in a long parallel cystic duct where inflammation causes extrinsic bile duct compression as seen in our case. If inflammation persists, the gallbladder can adhere to the bile duct, causing pressure necrosis and fistula formation.[7] A cholecystobiliary fistula occluding one-third of the duct is a Type 2 abnormality, whereas occlusion of two-thirds of the duct or complete occlusion are classified as Type 3 and 4 respectively.

Given the broad differential diagnosis for the cause of post cholecystectomy syndrome and facilitation of safe and effective surgical therapy a combination of noninvasive radiologic imaging in the form of abdominal ultrasonography, abdominal CT scan with IV contrast, and magnetic resonance cholangiopancreatography (MRCP) should be considered.

US is used as a routine investigation for biliary disease. This technique can reveal gallstones and cholecystitis and reveal evidence of Mirizzi syndrome[8] Existing literature confirms a diagnostic accuracy of 29%, with sensitivity between 8.3% and 27%.[9]

MRCP is a non-invasive imaging technique with a 50% diagnostic accuracy rate. Although MRCP can delineate the typical characteristics of Mirizzi Syndrome, such as a stone in the common hepatic duct (CHD), extrinsic compression of the CHD, and dilatation of the CHD with normal-sized CBD. MRCP can therefore be used to distinguish biliary conditions including cancer. However, MRCP is not efficient at localizing a chole-cystocholedochal fistula.[9]

Despite its invasiveness, ERCP is considered a gold standard diagnostic tool for Mirizzi Syndrome with a mean sensitivity rate of 76.2%.[9] Furthermore, ERCP can accurately determine the presence and location of fistula and biliary obstruction. However, ERCP can also be associated with devastating complications and its application in patients suffering Mirizzi syndrome should be considered with significant caution.[8]

Although no specific radiological features of Mirizzi syndrome can be recognized on CT imaging, this technique can be very effective in detecting the cause and location of biliary obstruction. CT is also useful for differentiating hepatic portal or hepatic infiltration of tumors.[9] In patients with chole-cystobiliary fistula, CT scanning is valuable in distinguishing Mirizzi syndrome from neoplasia. For example, Fabien et al[10] reported 5 cases in which CT scan adequately diagnosed Mirizzi syndrome and concluded that adequate diagnosis can be reached on the basis of clinical symptoms and images on a CT scan.

Surgical management is the mainstay treatment for Post-operative Mirizzi syndrome, although this is challenging for several reasons as there is a low index of suspicion for this condition among surgeons, largely owing to its rarity and distortion of the anatomy by dense adhesions due to longstanding inflammation and the advancement of chole-cystobiliary or Chole-cysto-enteric fistula.[9]

Traditionally, laparotomy has been considered as the technique of choice for the management of Mirizzi syndrome. This is largely due to its relative safety when compared with the laparoscopic technique which is associated with high conversion rates (31-100%) and an increased incidence of bile duct injury.[9]

Our case exemplifies the usefulness of CT scanning, after inconclusive ultrasound and ERCP. It helps in surgical planning for removal of remnant cystic duct calculi without any further complications.

Conclusions

At present, Mirizzi syndrome is evaluated in the clinic without internationally-recognized clinical guidelines. Furthermore, advancement in diagnostic techniques have not made it easier for a confirmed diagnosis to be made before surgery, even though sensitivity and specificity have improved markedly.

The combination of ≥ 2 diagnostic modalities has become common place in the management of Mirizzi syndrome. There is currently no consensus among experts in terms of the added benefit of this practice.[9]

The role of contrast enhanced CT should never be underestimated in this regard and surgeons should be aware to keep the differential of post cholecystectomy syndrome in mind in all patients having upper G.I symptoms after laproscopic surgery.

Conflict of Interest: None

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