Case Report

Foreign bodies in common bile duct in post cholecystectomy status—case series of 8 cases—A single center experience in western India

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ABSTRACT

Foreign bodies in common bile duct (CBD) are rare. Obstructive jaundice in patients who have undergone cholecystectomy may be due to a variety of causes. Common causes of obstruction in these cases are residual stones, inflammatory or ischaemic strictures following CBD injury during cholecystectomy or malignant strictures. Foreign bodies in the bile duct in these post cholecystectomy patients are known but reported very rarely. Clinical features and biochemistry of these patients are no different than those due to other causes mentioned above. Imaging studies will show obstruction due to stones or sludge or narrowing but may not give conclusive diagnosis of a foreign body. Endoscopic ultrasound is helpful in these cases as it shows a hyperechoic foreign body within the stone if the substance is a metallic clip. In our current case series, we are presenting eight such cases with post cholecystectomy foreign bodies, in the form of materials used for ligating or clipping the cystic duct before transection during cholecystectomy, or a mistakenly left behind gauze piece, migrating into the bile duct and forming a nidus for stone formation and causing CBD obstruction. To conclude, if a patient presents with biliary obstruction with a history of cholecystectomy, the possibility of foreign body in the CBD must be considered as a possible differential diagnosis.

Keywords: Cholangiopancreatography, endoscopic retrograde; Common bile duct; Foreign bodies; Post cholecystectomy; Surgical clip

Introduction

In the era of minimal invasive surgery, Laparoscopic cholecystectomy is the accepted gold standard for cholecystitis due to any cause. Similarly, endoscopic retrograde cholangiopancreatography (ERCP) is the accepted standard of care for management common bile duct (CBD) obstruction due to stones. Migration of suture material used for ligating the cystic duct, a surgical clip applied to cystic duct before transection and a surgical gauze piece, mistakenly left in the gall bladder fossa by the surgeon during dissection, into the CBD are lesser known complications of cholecystectomy. These are rare and very few reports are available in surgical literature.

Here we describe a series of 8 cases that we came across in last five years. All these patients had undergone laparoscopic cholecystectomy and then presented at varying intervals with CBD obstruction secondary to foreign bodies, surrounded by a stone cast.

Case Report

In the last five years, we encountered 8 post cholecystectomy cases wherein we found different types of foreign bodies surrounded by a stone cast in the bile duct. Patient demography, clinical parameters, ERCP findings, outcome and complications if any were recorded and analyzed and presented in Tables 1, 2.

Case 1

A 65-year-old female with epigastric pain, nausea and fever for 5 days. Laparoscopic cholecystectomy 2 years back. Patient had leukocytosis and altered liver function test (LFT). Ultrasonography (USG) and magnetic resonance cholangiopancreatography (MRCP) revealed dilated CBD with elongated echogenic material. Endoscopic ultrasound (EUS)—two parallel hyperechoic structures with shadowing in distal CBD with sludge. ERCP revealed chol-
### Table 1. Demographic Data and Case Details

| Case | Age (yr) | Sex | Medical history | Presenting symptom | Duration of cholecystectomy | Other surgery | FB in CBD | ERCP Success rate (%) | Complication | Follow-up/ outcome |
|------|----------|-----|-----------------|--------------------|-----------------------------|---------------|-----------|-----------------------|--------------|---------------------|
| I    | 65       | Female | None            | Epigastric pain Nausea Fever | 1 yr | None | Metal clips (2) | 100 | None | Asymptomatic at 12 mo |
| II   | 45       | Male | None            | Abdominal pain Jaundice | 2 yr | ERC and stone extraction 1 month back | Surgical gauze piece | 100 | None | Asymptomatic at 12 mo |
| III  | 56       | Male | None            | Abdominal pain | 2 yr | ERC 2 years back | Surgical suture | 100 | None | Asymptomatic at 3 mo |
| IV   | 45       | Male | None            | Abdominal pain Jaundice Fever | 3 yr | None | Metal clips (2) | 100 | None | Asymptomatic at 6 mo |
| V    | 64       | Male | None            | Asymptomatic       | 2 mo | None | Metal clip (1) | 100 | None | Asymptomatic at 6 mo |
| VI   | 53       | Female | Hypertension and DM 3 yr | Abdominal pain Nausea Vomiting Fever | 17 yr | Bilroth I Hysterectomy Thyroidectomy | Metal clip (1) | 100 | None | Asymptomatic at 1 mo |
| VII  | 71       | Male | Parkinsonism 15 yr Hypertension 10 yr | Abdominal pain Fever | 3 yr | None | Metal clip (1) | 100 | None | Asymptomatic at 1 mo |
| VIII | 70       | Male | None            | Abdominal pain Nausea Vomiting | 1.5 yr | Ampullectomy | Hemoclip (1) | 100 | None | Asymptomatic at 1 mo |

FB, Foreign body; CBD, common bile duct; ERCP, endoscopic retrograde cholangiopancreatography; ERC, endoscopic retrograde cholangiography; DM diabetes mellitus.

### Table 2. Investigations

| Case | USG abdomen | CECT abdomen | MRCP | EUS |
|------|-------------|--------------|------|-----|
| 1    | Dilated IHBR, 12.7 mm CBD with elongated echogenic material within? Calculus, Stent | - | - | - |
| 2    | CBD stones | - | - | - |
| 3    | Prominent CBD with sludge | - | - | - |
| 4    | Dilated CBD with linear stones within | - | - | - |
| 5    | - | - | - | - |
| 6    | Dilated CBD, short biliary stent in distal CBD with abrupt irregular filling defect around stent | - | - | - |
| 7    | Two parallel hyper echoic structure with shadowing in distal CBD with CBD sludge | - | - | - |
| 8    | Dilated cystic duct and CBD with stone around a hyper echoic structure possibly stone-migrated clip complex | - | - | - |

USG, Ultrasonography; CECT, contrast-enhanced computed tomography; MRCP, magnetic resonance cholangiopancreatography; EUS, endoscopic ultrasound; IHBR, intrahepatic biliary radicles; CBD, common bile duct.
angitis. Two metal clips were removed from CBD and a 10 Fr straight plastic stent. It was removed after 6 weeks (Fig. 1).

We had four more cases (Cases 4–7) where we removed metallic clips from CBD as mentioned in the Tables 1, 2.

**Case 2**

A 45-year-old male presented with jaundice and abdominal pain. Laparoscopic cholecystectomy 2 years back. Ultrasound revealed CBD stone. LFT was altered. Patient had endoscopic retrograde cholangiography (ERC), stone extraction with stenting 1 month back. At the time of stent removal, CBD clearance with a dormia basket revealed thin white delicate structure, looking like a dead worm. But on close examination it turned out to be a “surgical gauze piece”. This was retrieved intact. Occlusion cholangiogram confirmed complete CBD clearance (Fig. 2).

**Case 3**

A 56-year old male presented with right hypochondriac pain. Emergency ERCP followed by laparoscopic cholecystectomy was done 3 years back. Surgical notes mentioned that cholecystectomy was difficult and surgical suture with metal clip were used for securing cystic duct. LFT was altered. Ultrasound showed prominent CBD with sludge. ERCP revealed thin long fragment, which macroscopically was a surgical suture (Fig. 3).
Case 8

A 74-year male presented with abdominal pain, nausea and vomiting. He had laparoscopic cholecystectomy done one and half years back. In addition, he had a history of ampullectomy done. He had deranged liver function. USG showed a dilated CBD with a soft stone in it. ERC revealed a sludge ball formed over a hemoclip used for cystic duct ligation (Fig. 4).

Discussion

Common causes of extrahepatic bile duct obstruction are stones and malignant or benign stricturous lesions. Biliary tract foreign bodies like surgical suture material, chicken bone, tomato skin, surgical gauze piece, fish bone, and drum stick are uncommon entities but are reported to present with biliary obstruction. Cimsit et al \(^1\) claimed to publish the first case of textiloma (surgical gauze) obstructing CBD requiring surgical removal in 2006. Similar case was published by Bhandari et al \(^1\) where a surgical gauze was removed with aid of choledochotomy as ERCP and biliary cannulation failed in their case Cipolletta et al \(^3\) and Giestas et al \(^5\) reported successful retrieval of surgical gauze piece from CBD with ERCP and sphincterotomy.

With rapidly increasing use of minimally invasive surgery and therapeutic ERCP, more cases of foreign bodies in bile duct, like surgical clips are being reported. Literature review revealed only 86 reported cases of post cholecystectomy clip migration into CBD. Reported cases showed that age and sex predilections are variable. The time for migration of clip varies from 11 days to 20 years. \(^3\) The number of migrated clips ranges from 1–6. \(^3\)

The most common symptoms in our series are abdominal pain, jaundice and fever, on occasions asymptomatic. In one such asymptomatic case, foreign bodies were retrieved during a session of removal of previously placed CBD stent. Imaging studies may not give substantial information or a conclusive evidence of foreign bodies in these patients. On occasions, surgical clips were seen on plain X-ray abdomen as radio opacity in the line of bile duct. Contrast-enhanced computed tomography abdomen and MRCP usually report CBD stone with a hyperdense echo. EUS show hyper echoic linear structure with acoustic shadowing. ERCP is diagnostic as well as therapeutic and is the first line of treatment depending upon its availability and expertise. Cholangiogram may show a clip stone complex as a filling defect.

The suggested risk factors are, difficult cholecystectomy, prior abdominal surgery, inaccurate clip placement, use of more than 4 clips, bile duct injuries with resultant stricture and biloma formation with local suppurative inflammatory processes. \(^4\)

The proposed pathogenesis proposed are inappropriate or more than four clip placements on cystic duct lead to pressure necrosis with resultant local suppurative inflammation which in turn results in clip getting embedded in the wall of the CBD with subsequent migration to biliary system. Secondly, an adjacent structure compressing the clipped cystic duct stump over a period of time resulting in invagination of the cystic duct and clips into the CBD. \(^7\) Thirdly, cystic duct stump necrosis secondary to pressure, ischemia or inflammatory process followed by migration towards a path of least resistance, most probably into the CBD and lastly retrograde reflux from the duodenum. \(^3\)

The suggested preventive measures are use of only two clips with proper placement, use of harmonic scalpel guided clip less cholecystectomy, use of absorbable clips and proper counting and disposal of gauze piece used for blunt dissection and haemostasis.

With experience we can now predict such migration looking for hyperdense structure on computed tomography and EUS. The gauze piece was a surprise and a boon for the surgeon who left it by mistake in the gallbladder fossa. We found that not only metal but also the non-metallic hemoclip can migrate into the CBD. It is great way that nature takes care of foreign materials in our body.

To conclude, foreign bodies in CBD are rare but should be considered in cases with a history of cholecystectomy. ERCP remains the first line of treatment for such cases with a high success rate.

Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

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