



The Forgotten Stents – Case Series Stentolith after Biliary Drainage Procedures – Forgotten Entity – A Case Series

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Abstract

Cholelithiasis is the presence of stone in the common bile duct. Pathogenesis involves biliary infection, biliary stasis, malnutrition, parasitic infections, and in rare cases retained stents (post-ERCP). The most common complications of biliary drainage stents include cholelithiasis and stentolith formation. Others include severe cholangitis, stent migration, stent occlusion or fracture, biliary stricture, or secondary biliary cirrhosis. The sequelae of the forgotten biliary endoprosthesis are highly varied—it may remain silent for years or may have devastating complications. The majority of the patients will require surgical intervention for the clearance of stentoliths—whether laparoscopic or open CBD exploration depending on the size and adherence of the stone and the surgeons' preference. Here we present 3 cases of stones that were formed over biliary drainage stents and were operated on.

Keywords: cholelithiasis, Stentolith , CBD stones , ERCP, T-Tube

Introduction

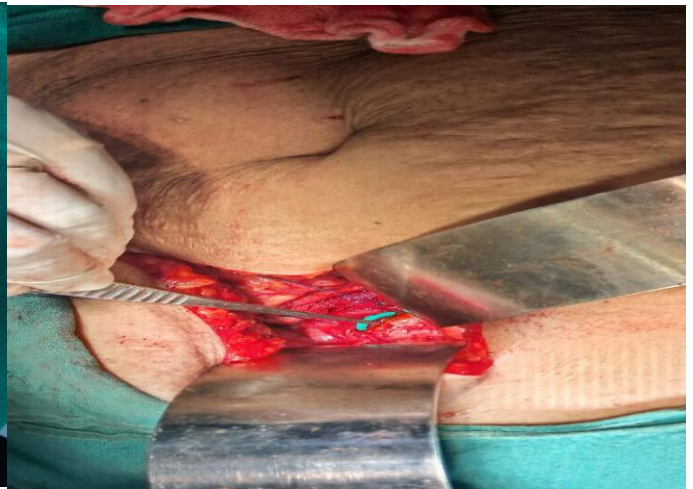
Cholelithiasis is the presence of stone in the common bile duct. Common bile duct stones have been noted in 10-15% of patients with cholelithiasis. (1) However, in the Asian population primary CBD stones are more common. Pathogenesis involves bile infection, biliary stasis, malnutrition, parasitic infections, and in rare cases stents (post-ERCP). Stentolith is a complication of a forgotten stent in the CBD which acts as a nidus for stone formation(3). Stents for cholelithiasis should ideally be removed within 3 to 6 months of insertion of the stent to avoid the myriad of complications such as cholangitis, stentolith formation, or bile duct stricture.[4] However, many patients, either due to ignorance or lack of education about the endoprosthesis, fail to follow up in time for the stent removal. (5) Thus, instead of undergoing CBD stent removal, a seemingly benign procedure, the patient ends up undergoing a complicated surgery with the potential for far more morbidity.

Case 1

A 62-year-old female presented with complaints of pain in the right side of the upper abdomen and nausea and decreased appetite for 2 weeks. She had no history of fever or jaundice. There is a history of open cholecystectomy 10 years back, later she developed pain and jaundice 5yrs back for which she was evaluated and diagnosed with cholelithiasis and underwent ERCP and stenting which gives the history of not getting the stent removed. Details of stenting were not known to the patient and no records were available. On clinical examination, the patient had a surgical scar from a previous open cholecystectomy. The rest of the systemic examination was unremarkable. USG showed Cholelithiasis with dilated CBD of 18mm diameter. MRCP showed Cholelithiasis with bilobar IHBRD and multiple filling defects with post-cholecystectomy status, stent was also not removed during MRCP.

The patient was planned for open CBD exploration to remove the stones, after preop assessment, pre-anesthetic evaluation, and obtaining informed consent, the patient was taken up for surgery. Kocher's incision was given, hard calculi were identified filling the CBD, and choledochotomy was done which revealed brown sludge-like material with large stone encasing plastic stent inside CBD

completely, stones densely adhered to the stents. The stones were removed completely and the stent was extracted. CBD was closed over T-Tube. Post-op recovery was uneventful and abdominal drain was removed on POD 4 and the patient was discharged on POD 10. There were no further complications on follow-up.



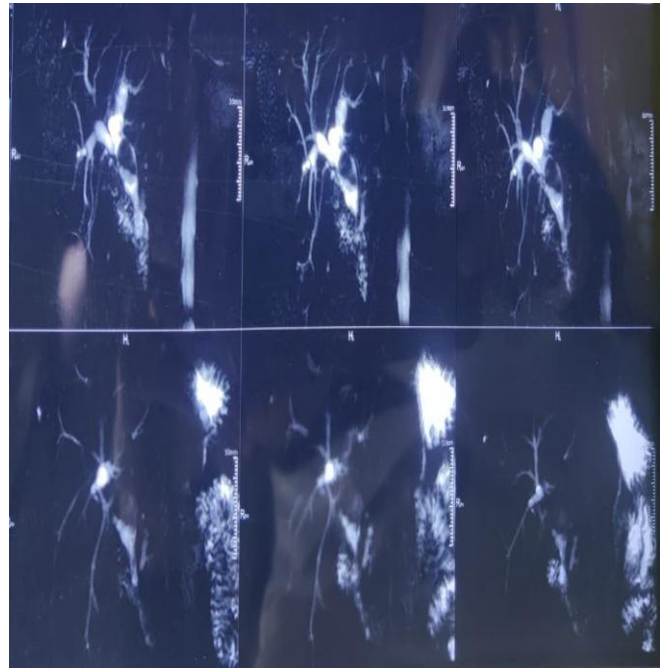
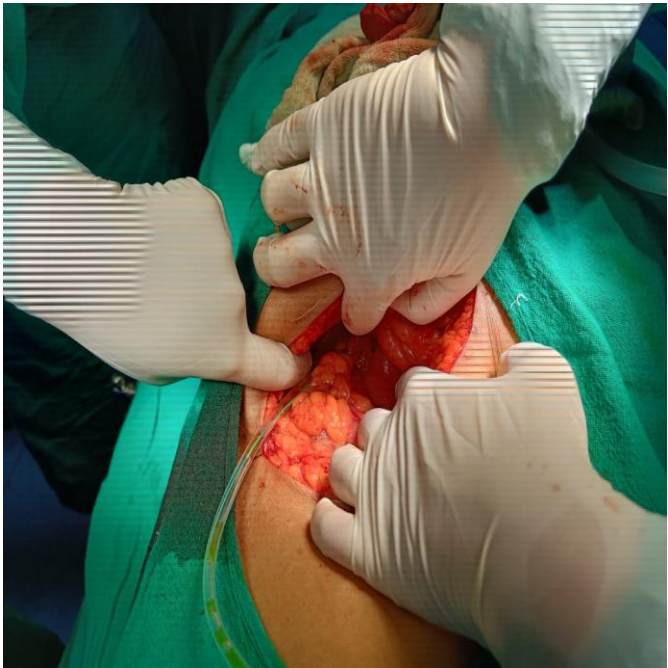
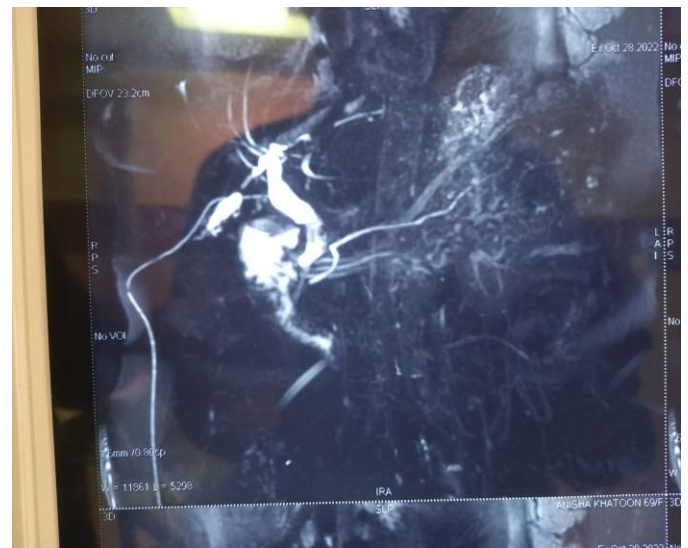
Case 2

A 69-year-old female presented with complaints of pain abdomen, vomiting, and generalized body weakness for 3 days. She had no history of fever or jaundice. There is a history of open cholecystectomy 8 years back, later she developed pain and jaundice 3 months back for which she was evaluated and diagnosed with choledocholithiasis. ERCP was attempted but it failed due to excessive inflammation, hence PTBD was done.

On clinical examination, the patient had a surgical scar from a previous open cholecystectomy. The rest of the systemic examination was unremarkable. USG showed dilated intra and extra-hepatic biliary nodules and obstructed biliopathy. MRCP showed resolving

pancreatitis, and choledocholithiasis with moderate upstream dilatation of CHD, CBD, right and left hepatic ducts, and central IHBR. CBD measures 15 mm with a filling defect of 1.5x 1 cm. liver function test – SGOT/SGPT/ALP- 51/102/35.

After stabilization of the general condition of the patient, she was taken up for open choledochotomy. Kocher's incision was given, and CBD showed hard calculus. Choledochotomy was done, hard calculus adhered to stent was identified and removed, complete clearance of CBD was achieved, and CBD was closed over T-Tube. Post op period was uneventful, an abdominal drain was removed on POD 3 and the patient was discharged on POD 9. There were no complications during the follow-up visits.

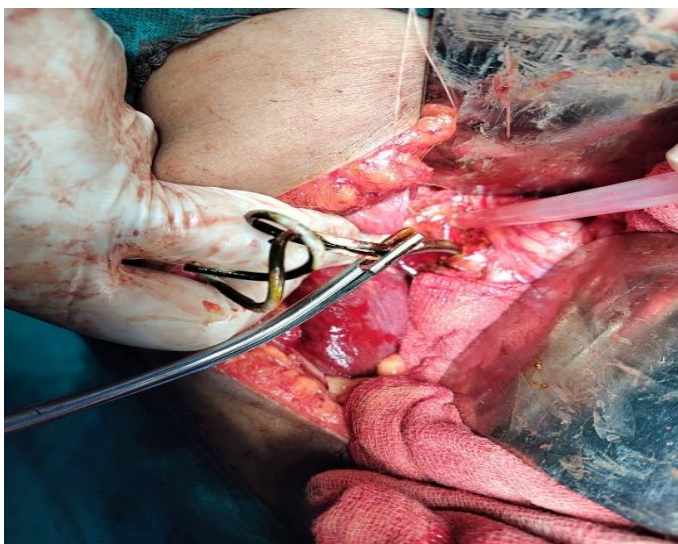


Case 3

A 50-year-old female presented with complaints of pain and fever for 2 weeks. There was H/O jaundice, fever, and pain abdomen 3 months back for which she was evaluated, and an ERCP with stenting was performed. She also gives a history of open cholecystectomy 10 yrs back. As the patient had no further problems, she gives a vague history of not getting the stent removed. Clinical examination was not significant. USG showed cholelithiasis with choledocholithiasis with dilated CBD 12.8 mm with large filling defects in the CBD. MRCP showed choledocholithiasis with moderate upstream dilatation of CHD, CBD, right and left hepatic ducts,

and central IHBR. CBD measures 15 mm with a filling defect of 28 x 16mm. Liver function test – SGOT/SGPT/ALP- 23/21/164.

After stabilization of her general condition, she was taken up for open Cholecystectomy with CBD Exploration. Kocher's incision was given, and CBD showed a hard calculus. Choledochotomy was done, hard calculus adhered to the previously placed stent was identified and removed, complete clearance of CBD was achieved, and choledocho-duodenostomy was performed. Post op period was uneventful, the abdominal drain was removed on POD and the patient was discharged on POD. There were no complications during the follow-up visits.



Discussion

Cholelithiasis is the presence of stone in the common bile duct. Common bile duct stones have been noted in 10-15% of patients with cholelithiasis. (1) In 75% of cases CBD stones result from the migration of Gall bladder stones through the cystic duct into the Common bile duct. However, in the Asian population, primary CBD stones are more common. Pathogenesis involves bile infection, biliary stasis, malnutrition, parasitic infections, and in rare cases stents (post-ERCP). ERCP with CBD stone clearance / CBD stenting followed by laparoscopic Cholecystectomy or laparoscopic CBD exploration with cholecystectomy as single-stage surgery is the current mainstay of treatment of cholelithiasis with choledocholithiasis (2). For larger stones, open or laparoscopic CBD exploration is done.

The biliary endoprosthesis has been used for biliary drainage as a temporary measure or alternative for patients who are unfit for surgery. Biliary drainage is of great importance in maintaining bile flow in cases of stone impaction in the CBD. Placement of a biliary stent is essential for the treatment or prevention of acute cholangitis with a success rate of > 95% [3-4]

Early outcomes of biliary stenting are well established and include good drainage and a low complication rate, but late outcomes remain uncertain. Most reports revealed that the success rate of endoscopic biliary stenting was nearly 100% and that early morbidity was low and could be well controlled [5-7]. The CBD stents used are of two broad categories—plastic and metallic stents. Metallic stents are usually made of stainless steel or

nickel–titanium alloy. Plastic stents are generally used as a temporary measure—for post-ERCP CBD clearance, palliative stenting in metastatic disease with an expected life span of <3 months, or temporary biliary drainage before surgery. Plastic stents, although economical, are prone to getting occluded—primarily due to complexes formed of microbial colonies and bacterial byproducts coupled with calcium bilirubinate and calcium palmitate crystals which eventually promote bacterial adherence and biofilm formation. The release of bacterial β -glucuronidase also plays a role by causing the precipitation of calcium bilirubinate which is aggregated into stones by glycoproteins. The retained stent also acts as a foreign body, thereby promoting colonization of the bacteria over it.[8-9] The major disadvantage of biliary stenting is clogging of the endoprosthesis. It is widely known that the mean patency duration of the plastic biliary stent is about 6 mo to 12 mo for benign diseases[10-11]. Replacement of plastic stents is therefore recommended every 3-6 mo to prevent cholangitis. Biliary passage patency is maintained longer when stents are inserted for benign diseases such as biliary stone or benign biliary stricture, as compared to metal stents of malignancies

Stentolith is a complication of a forgotten stent in the CBD which acts as a nidus for stone formation(3). Thus, plastic stents for choledocholithiasis should ideally be removed within 3 to 6 months of insertion of the stent to avoid the myriad of complications such as cholangitis, stentolith formation, or bile duct stricture.[11] However, many patients, either due to ignorance or lack of education about the

endoprosthesis, fail to follow up in time for the stent removal. [12] Thus, instead of undergoing CBD stent removal, a seemingly benign procedure, the patient ends up undergoing a complicated surgery with the potential for more morbidity. The sequelae of the forgotten biliary endoprosthesis are highly varied—it may remain silent for years or may have devastating complications. In symptomatic patients, common clinical presentations include jaundice, abdominal pain, vomiting, and fever.

The most common complications according to some case series include choledocholithiasis and stentolith formation. Others include severe cholangitis, stent migration, stent occlusion or fracture, biliary stricture, or secondary biliary cirrhosis.[10] The majority of the patients will require surgical intervention for the clearance of stentoliths—whether laparoscopic or open CBD exploration depending on the size and adherence of the stone and the surgeons' preference. Bilioenteric bypass with side-to-side Roux-en-Y choledochojejunostomy, CBD exploration with choledochoduodenostomy, and endoscopic clearance of stentoliths have also been done in some cases.[9-12]

Little is known about the complications and management of long-term biliary stents retained for more than 1 year. A recent study of 5 cases of long-standing forgotten biliary stents with 45.5 mo (range: 23-84 mo) of stent-stay reported that 4 of them required surgery for treatment[13]. Another recently published article documented that 2 of 3 patients (75%) underwent surgery for treatment of long-stayed forgotten stents[10-11]. In this study, however, 35 of 38 patients (92.1%) with retained long-term biliary stents were successfully treated by endoscopic approach. In 3 cases of endoscopic stent removal failure in patients who were unfit for surgery, cholangitis could be controlled by additional biliary stent placement without surgery.[12]

Conclusion: Patients with forgotten biliary stents presenting with serious complications are not uncommon in India. Unaware of the complications of long-dwelling biliary stents, patients ignore the advice for the timely removal of biliary stents. All patients should be informed of the possibility of complications related to retained long-term endoprosthesis placement, and stent change or

definite treatment should be considered within 1 year of stent placement.

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