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RESEARCH ARTICLE

Retained T tube: A Very Rare Cause of Choledocholithiasis

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Long-term post cholecystectomy complications, even years after surgery, are the post cholecystectomy syndrome and recurring complaints owing to bile duct stones that are eitherretained postoperatively, recur due to stasis of (infected) bile or, rarely, are the result of stone formation around a foreign body. Numerous reports exist of foreign bodies (FBs) acting as nidusfor stone formations within the biliary system. The FBs reported include surgical sutures, surgical clips, fragments of metal and plastics, ingested materials, and parasites. Surgical clips are reported to be the most commonly reported FBs that induce iatrogenic biliary stones. We describe the case of a patient with stones that developed around retained T tube aftercholecystectomy.

INTRODUCTION

Common bile duct (CBD) stones can beclassified as primary and secondary. Secondarystones originate in the gallbladder and migrateinto the CBD, which are the more common type.Primary stones, forming de novo within theCBD are less frequently encountered. Stasis is animportant contributor for forming bile duct stones, and can result from stricture or other causes of obstruction, including foreign bodies. A variety of foreign bodies have been reported in the common bile duct which include surgical gauze,[1] fish bone,[2] dormia basket,[3]endo-clips,[4] cherry stalk,[5] splinters and shrapnel,[6] balls of thread [7] etc. The patients usually presentwith features of obstructive jaundice, cholangitis or raised liverenzymes. During the past two decades, many studies have been conducted on the pathogenesis of bile duct stones, but nevertheless, their exact pathogenesis remains unknown.

CASE REPORT

Our case was a 47 year old female with history of cholecystectomy and CBD exploration 14 years back. T tube kept for drainage was removed after 14 days according to available history. Patient was doing well for about one year after surgery. About after one year patient developed pain upper abdomen which was intermittent , colicky, radiating to back, lasting for 20-30 minutes and the frequency of similar episodes was once in 2-3 months for about 12 years. Pain was relieved always after taking analgesics. For last one year the frequency and severity of the pain increased and patient developed icterus 3 months before. Patient was referred to our institute, Where examination revealed icterus, epigastric tenderness and guarding. Liver function tests showed ALP of 480 IU/L and bilirubin 8 mg/dl. Ultrasonography showed common bile duct of 12 mm diameter filled with echogenic calcified material. MRCP (**Fig. 01**) revealed dilated intrahepatic biliary radicals (IHBR) left more than right, completely blocked CBD/CHD (common bile duct/common hepatic duct) by a mixture of small calculi and debris. ERCP (**Fig. 02**) was done which showed evidence of choledocholethiasis with a tube in it.CBD cannulation was done followed by papillotomy. Occlusive cholangiogramshowed large stone cast in CBD around the tube (T tube). The attempts to remove the tube and stone failed. Patient was referred to surgical gastroenterology. Surgery was done next day. The intraoperative findings were scar of previouscholedochoduodenostomy with a part of T tube (**Fig. 03**) in this area, lot of much and small stones in CBD/CHD/RHD/LHD (RHD=right hepatic duct, LHD=left hepatic duct). The stones and the T tube were retrieved with difficulty **(Fig. 04**). Patient was discharged on 6th postoperative day and is doing well.

DISCUSSION

Retained stones are the cause of choledocholithiasis after cholecystectomy, and these either arise due to primary formation (arising *de novo*) or as a consequence of biliary surgery. Bile duct stones are usually classified into two categories based on sites of formation, i.e., as primary or secondary stones. While primary or stasis stones are formed *denovo*and originate in the bile duct, secondary stones are formed primarily in the gallbladder and subsequently migrate to the bile duct, where they are retained [8]. InWestern countries, bile duct stones are most commonlysecondary, and bile duct stones are found in8% to 18% of patients with symptomatic gallstones.Co-existent gallbladder and common duct stones arecorrelated with increasing age, Asian descent,chronic inflammatory conditions (primary sclerosing-cholangitis, acquired immunodeficiency syndrome,parasites), and possibly hypothyroidism.The pathogenesis of primary bile duct stoneslikely differs from that of secondary bile duct stones.Previous studies have implicated bacterial infections and biliary stasis as important factors in formationof primary duct stones [9]. Bacteria have been foundin mixed pigment stones, and bile infection appearsto precede stone formation [10]. Parasitic infection hasalso been associated with primary duct stones, primarilyin Asia.

Various factors predispose stone formation in the biliary tract,such as malignancy, benign stricture, bacterial infection, ascaris(round worm) infestation (especially in East Asia), and a broadspectrum of foreign bodies [11]. It is presumed that these factors play animportant role in bile stasis by blocking normal bile flow in thebiliary tract. Moreover, bile flow blockage could be an initiatingfactor of nucleus formation in biliary calculi in the CBD.In a study, which investigated foreign body infection in the biliary tract it was found that implants in the biliary tract impaired the local host defense mechanism, resulting in an increased susceptibility to microbial infection and fibrosis [12]. These plastic stents if kept for a prolonged period promote bacterial proliferation, and release of bacterial beta-glucuronidase, which results in the precipitation of calcium bilirubinate. Calcium bilirubinate is then aggregated into stones by an anionic glycoprotein.Koivusalo et al [13] found that latex tubes were toxic and induced moderate to pronounced fibrosis and epithelial damage on the CBD wall, unlike silicone tubes.

Since Homan first described silk suture material acting as anidus for the development of subsequent CBD stones aftercholecystectomy in 1897, several authors have reported thatsuture materials may cause choledocholithiasis [14]. Surgical clip migration is well-known to occur. Walker etal. [15] first reported surgical clip migration into the bile duct in1979.Ban et al. [16] reported that irritating operative residuals, such asnon-absorbable suture materials, account for 82% of stonesthat form around a foreign body. Surgical sutures, especiallythose composed of non-absorbable materials, appear tofunction as a nidus for crystallization; bile salts gradually depositaround such nuclei, finally develop into large stones.There are many case reports and series in urological literature of calculi forming around the retained ureteric stent. These 'forgotten stents' have been documented to obstruct the urinary system and may result even in renal failure and death. A majority of these forgotten stents are dealt with endoscopically [17]. Ours is a rare experience where retained T tube in the hepatobiliary ductal system has led to stone formation and related complications.

Endoscopic stone removal with a retrieval balloon catheterand a Dormia basket after sphincterotomy has been recommendedas the procedure of choice for the majority of patientswho have undergone previous cholecystectomy, since itrequires a shorter hospital stay than surgical manipulation [18]. Bileduct stones can also be extracted endoscopically in patientswith biliary pancreatitis or acute obstructive cholangitis. If difficulty arises surgery in the form of CBD exploration is the alternative option.

Fig. 01: M**RCP showing dilated IHBR and mixture of small calculi and debris in CBD**

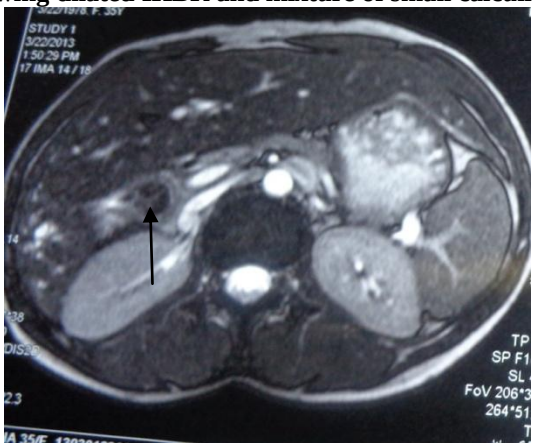

Fig. 02: ERCPshowing choledocholethiasis with a T tube in it

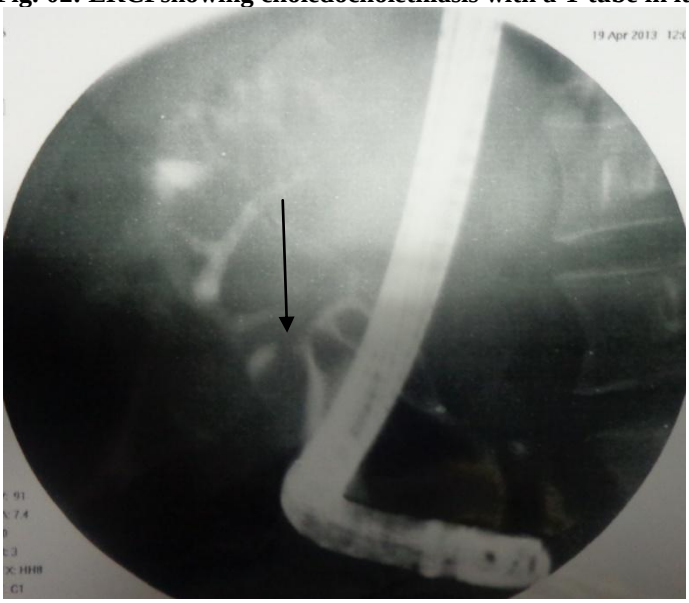

Fig. 03: Intraoperative T tube retrieval

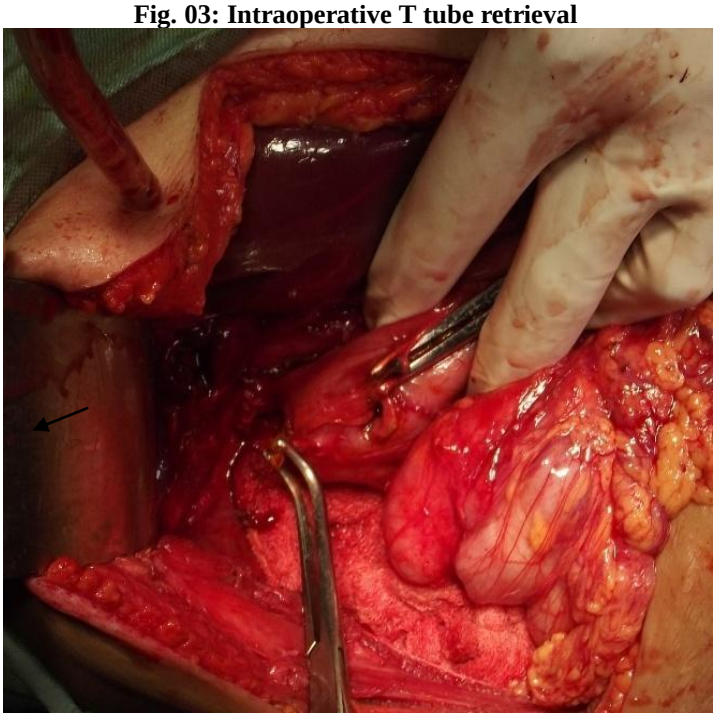

Fig. 04: Retrieved T tube

CONCLUSION

Forthose patients who have undergone either open cholecystectomyor laparoscopic cholecystectomy, any surgical material including T tubes should be considered as a cause of recurrentpainful symptoms in the right upper quadrant. The case gives us the opportunity to remind surgeons andendoscopists that biliary stones can be formed by thesurgery-related materials in patients that have undergoneprevious biliary surgery.In conclusion, any exogenous biliary tract foreign bodies,including non-absorbable suture materials, T tubes can infrequentlyfunction as niduses for stone formation in the common bile duct.

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REFERENCES

1. Cipolletta L, Bianco MA, Rotondano G, Prisco A, Catalano M, Gatto A, et al. Endoscopic retrieval of a surgical gauze from the common bile duct. Ital J Gastroenterol Hepatol.1997;**29**:58–61.
2. Sakai T, Kihara M, Wagayama H, Shimizu A, Kuniyoshi M, Tameda Y. A case of recurrent choledocholithiasis due to foreign bodies (fish bones) after endoscopic sphincterotomy (abs). Nippon ShokakibyoGakkaiZasshi. 1997;**94**:143–7.
3. Halfhide BC, Boeve ER, Lameris JS. Percutaneous release of Dormia baskets impacted in the common bile duct. Endoscopy. 1997;**29**:48.
4. Kitamura K, Yamaguchi T, Nakatani H, Ichikawa D, Shimotsuma M, Yamane T, et al. Why do cystic duct clips migrate into the common bile duct? Lancet. 1995;**346**:965–6.
5. Kelly MD, Hugh TB. Cherry stalk in the common bile duct. Aust N Z J Surg. 1993;**63**:571–4.
6. Mitchell R, Kerr R, Barton J, Schmidt A. Biliary obstruction secondary to shrapnel. Am J Gastroenterol. 1991;**86**:1531–4.
7. Cimsit B, Keskin M, Ozden I, Alper A. Obstructive jaundice due to a textiloma mimicking a common bile duct stone. J HepatobiliaryPancreat Surg. 2006;**13**:172–3.
8. Thistle JL. Pathophysiology of bile duct stones. World J Surg 22:1114-1118, 1998
9. Kaufman HS, Magnuson TH, Lillemoe KD, Frasca P, Pitt HA. The role of bacteria in gallbladder and common duct stone formation. Ann Surg 1989;209:584-92.
10. Cetta F. Bile infection documented as initial event in the pathogenesis of brown pigment biliary stones. Hepatology 1986;6:482-9.

11. Schulman A. Non-western patterns of biliary stones and the role of ascariasis. Radiology 162:425-430, 1987
12. Yu JL, Andersson R, Wang LQ, Ljungh A, Bengmark S. Experimental foreign-body infection in the biliary tract in rats. Scand J Gastroenterol. 1995;**30**:478–83.
13. Koivusalo A, Makisalo H, Talja M, Cormio L, Ruutu M, Wolff H, et al. Biocompatibility of latex and silicone T tubes in the porcine common bile duct: an experimental study. Res Exp Med (Berl). 1996;**196**:53–66.
14. Homans J. Gall-stones formed around silk sutures, twenty months after recovery from cholecystectomy. Ann Surg 26:114-116, 1897
15. Walker WE, Avant GR, Reynolds VH. Cholangitis with a silver lining. Arch Surg 114:214-215, 1979
16. Ban JL, Hirose FM, Benfield JR. Foreign bodies of the biliary tract: report of two patients and a review of the literature. Ann Surg 176:102-107, 1972
17. Aron M, Ansari MS, Singh I, Gautam G, Kolla SB, Seth A, et al. Forgotten ureteral stents causing renal failure: multimodal endourologic treatment. J Endourol. 2006;**20**:423–8.
18. Sivak MV Jr. Endoscopic management of bile duct stones. Am J Surg 158:228-240, 1989