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Original Research Article

Value of routine milking of cystic duct during laparoscopic cholecystectomy

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ABSTRACT

Background: Cystic duct stones (CDS) although they are occasionally encountered during laparoscopic cholecystectomy (LC) and are not detected easily by preoperative investigations however it is worthy to detect them intra-operatively as they will decrease the incidence of postcholecystectomy pain and they will alarm us to the more serious common bile duct (CBD) stones. So, we aimed at this study to evaluate the role of cystic duct milking in detection of cystic duct stones and its significance.
Methods: This study was performed on 150 cases with calcular cholecystitis at Menofia University hospital in the period from August 2015 to May 2017. All patients had undergone LC, cystic duct milking. On table cholangiogram was done for cases that showed CDS.
Results: CDS were detected in 28 cases, preoperative investigations failed to detect any of them however retrospectively 19 cases (67.8%) of them revealed to have mild transient liver functions derangement associated with acute right hypochondrial pain. Wide cystic duct (more than 4 mm) was recorded in 3 cases (10.7%) out of 28 cases that showed CDS. The incidence of association of cystic duct stones and CBD stones was found in 10 cases (35.7%).
Conclusions: CDS are occasionally encountered during LC. They can be removed easily by just milking of cystic duct before clipping. The benefit is to decrease the incidence of post-cholecystectomy pain as well as it alerts us towards the more serious CBD stones. So on-table cholangiogram at that time becomes mandatory to avoid missed stone.

Keywords: Common bile duct stones, Laparoscopic cholecystectomy, Milking of cystic duct

INTRODUCTION

Cystic duct stones (CDS) are usually found during laparoscopic cholecystectomy (LC). In most cases they are noticed during dissection of the pedicle and at the time of dividing the cystic duct. Based on epidemiological evidence the most common bile duct stones originate in the gallbladder.[1,2] Ten percent to 15% of the patients with cholecystectomy experience post-cholecystectomy syndrome.[3] Cystic duct stones are involved in post-cholecystectomy pain, failure of insertion of on-table cholangiogram (OTC) catheter and the subsequent development of common bile duct (CBD) stones.[4-6] In most cases, the normal-caliber cystic duct cannot be seen on ultrasound, axial computed tomography (CT) or on direct preoperative cholangiography, whether by percutaneous transhepatic catheterization or endoscopic retrograde cholangio-pancreatography (ERCP).[7] Performing MRC from different angles makes cystic duct course visualization possible as well as approximate imaging generation of the apparent filling defect.[8] This is not always available and needs high index of suspicion preoperatively. From the previous, presence of cystic duct stones should be considered during laparoscopic cholecystectomy and should not be taken lightly even if it had not been detected preoperatively by the available investigations. Our study was done to demonstrate the value of routine

milking of cystic duct to detect and remove cystic duct stones.

METHODS

This was a prospective study performed upon 150 patients presented to outpatient clinic at Menofia University hospitals with chronic calcular cholecystitis. The study was conducted in the period from August 2015 to May 2017. Laboratory investigations (Complete blood count, prothrombin time, liver and kidney functions test, total and direct bilirubin, alkaline phosphatase and serum amylase) and imaging (abdominal ultrasound) were done to all patients. The exclusion criteria were acute calcular cholecystitis, history of jaundice or ERCP, CBD dilatation and biliary pancreatitis. Written informed consent was obtained from all patients.

Laparoscopic cholecystectomy and routine cystic duct milking were routinely performed to all patients and the on-table cholangiogram was done for cases which revealed cystic duct stones.

The procedure was performed using a standard four-port technique. The cystic duct was dissected intraoperatively and the critical view of safety was observed before the placement of an endo-clip at the junction of the gallbladder-cystic duct. An antero-lateral incision was made in the cystic duct using scissor and a partially closed Maryland was then used to milk the cystic duct beginning at its junction with CBD towards the gallbladder. At this stage either CDS or debris are noticed (Figure 1). Sometimes we needed to extend the incision toward the CBD to deliver large stones. For all cases that showed CDS and after clearance of that stones an on-table cholangiogram was done. A 6-F Ureteric catheter was passed through the cystic duct and the cholangiogram was obtained (Figure 2). If CBD stones were identified, they were dealt with at the same session and after removal of the gallbladder by endoscopic sphinctrotomy and stone extraction through endoscopic retrograde cholangio-pancreaticography (ERCP). The balloon entered the CBD till the confluence and was inflated and multiple attempts of trawling were done till stones, mud and free bile came out of papilla (Figure 3). In some cases, the dormia basket was used for stone extraction which failed to be extracted by using the balloon.

RESULTS

This study was conducted on 150 cases with chronic calcular cholecystitis at Menofia university hospital in the period from August 2015 to May 2017. All patients had undergone LC, and cystic duct milking.

The study comprised 40 (26.7%) male and 110 (73.3%) female. The range of the age was 18-72 years with mean±SD (38.51±12.41). Twenty-eight cases of CDS were documented (18.7%). In about 67.8% (19 cases) of those patients there was mild recent derangement of liver functions tests associated with acute right hypochondrial pain. A single stone was found in 20 cases (71.4%) and multiple stones were found in 8 cases (28.6%). The cystic duct was reported to be wide more than 4 mm in diameter in 3 cases (10.7%). On-table cholangiogram was done for all cases that showed cystic duct stones (28 cases). We recorded ten cases with CBD stones (35.7%) (Figure 4).

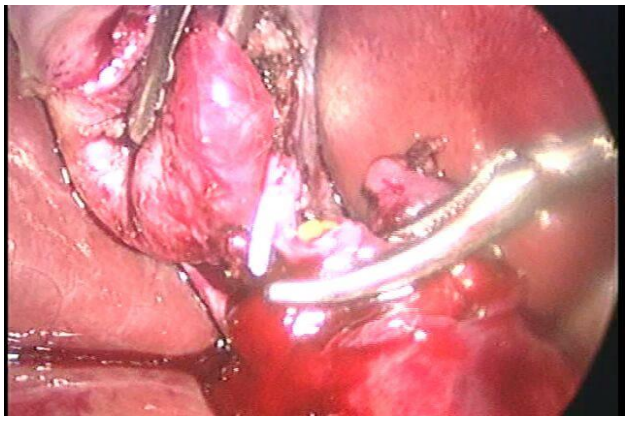


Figure 1: Cystic duct stones after milking of cystic duct.

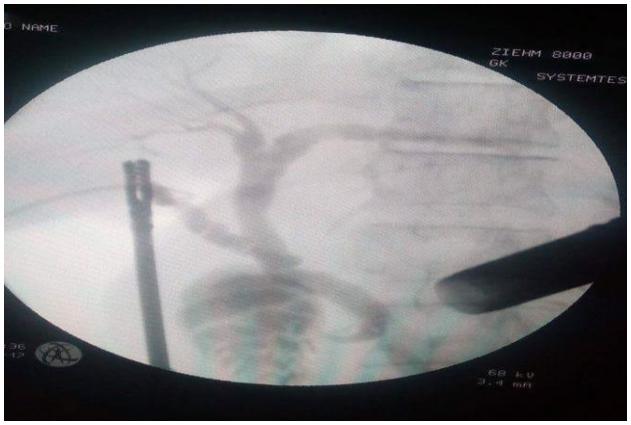


Figure 2: Intraoperative cholangiogram.

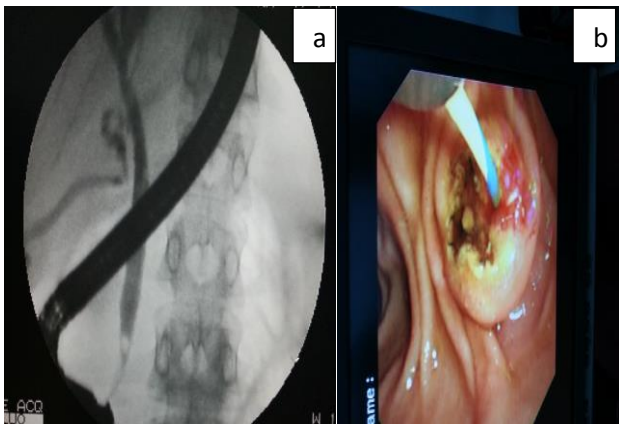
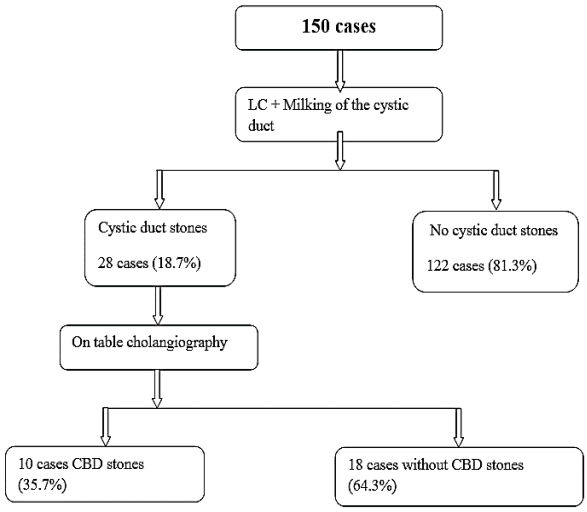


Figure 3: (a) ERCP with a stone in distal CBD and (b) Sphincterotomy and removal of stone.



(LC=Laparoscopic Cholecystectomy, CBD=Common Bile Duct)

Figure 4: Number and distribution of studied cases.

DISCUSSION

Cystic duct stones encountered during laparoscopic cholecystectomy are not given the importance that they worth. Residual cystic duct stones represent up to 25% of cases of post cholecystectomy pain that represents a great challenge to surgeons to resolve.[9] This group of patients is theoretically preventable by the simple maneuver of routine milking of cystic duct during laparoscopic cholecystectomy. In our study, although cystic duct stones were not detected in any case using abdominal U.S, there was incidence of about 18.7% of patients having cystic duct stones (28 cases). This matches with results published by Mahmud S and his colleagues in 2001 of a documented incidence of cystic duct stones of about (12.3%).[6] In another study published by Kambal A and others in 2014 stated that the incidence of cystic duct stones was about 19%.[10] Also a prospective study from St James University Hospital (Leeds, UK), presented in 2012 at the international conference of the Association of Surgeon of Great Britain and Ireland found sludge or CDS shown on OTC during LC at an incidence of 20%.[11] Pain during the month preceding surgery should alert the surgeon towards CDS.[10] In our study there was recent onset of mild transient liver function tests (LFTs) derangement associated with right hypochondrial pain in about 67.8% of patients who revealed to have CDS, and this was significantly higher in comparison to those who don't have CDS. This is consistent with the findings of Sezeur and Akel, where LFTs were deranged more commonly in association with CDS (47.6% versus 24.5%; P<0.05).[12] In Mahmud S, study at 2001 there was incidence of about 34.3% LFT derangement among those with CDS, however they documented an incidence of 70.3% of severe attack of pain preoperatively.[6] In our study, there was wide cystic duct in only 3 cases (10.7%) of CDS. Castelain et al, showed a positive correlation between a wider diameter cystic duct and the passage of stones.[13] On the other hand some stated that aberrant anatomy has been shown to be associated with the development of CDS and not the length of cystic duct.[14] Common bile duct stones which may be a cause of morbidity among patients with calcular gallbladder were found in our study in association with cystic duct stones in 35.7%. This explains the importance that should be given to presence of cystic duct stones. In Mahmud S study, they reported incidence of association up to 35%.[6] Also in the study of Kambal A and others they documented that the incidence was more common when CDS was present (50% versus 29%).[10] From the previous we can say CDSs are not rare and careful milking of the cystic duct before applying clips is a safe and effective way for detecting and extracting these stones even if they were not detected preoperatively. This simple maneuver may reduce the rate of post-cholecystectomy pain in addition of giving us a notice of more serious condition of CBD stones and raise our need to do intra-operative cholangiography.

CONCLUSION

Cystic duct stones are not rare. Their preoperative detection may be difficult but they can be detected easily intra-operatively and removed simply by just milking of cystic duct. Its detection and removal help in decreasing the incidence of postcholecystectomy pain. Also, their presence is an alarm to the more serious CBD stones and in this case intra-operative cholangiography becomes mandatory to avoid missed stone.

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Conflict of interest: None declared
Ethical approval: This study had been done after taking approval from the ethical committee of Faculty of Medicine in Al Menofia University and the competent authority of Al Menofia University Hospitals. Written consent was obtained from every patient for publication of this research and accompanying images

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