



INCIDENCE AND MANAGEMENT OF CYSTIC DUCT STONES

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ABSTRACT **BACKGROUND:** laproscopic cholecystectomy represents a significant change in the management of GB disease and is gold standard treatment for symptomatic cholelithiasis. However some 15-20% of patients continue to have postcholecystectomy syndromes, the causes of which are diverse. One important such cause is cystic duct stones which are usually missed intraoperatively. Focused attention towards same with some intraoperative maneuvers would help to reduce their contribution to PCS. **METHODS:** The study was carried over 3 years from 2014-2016 during which 743 LC were studied. Patients detected to have cystic duct stones by noting abnormal bulge, adhesions or non uniformity of duct were subjected to different intraoperative maneuvers like milking of duct, complete dissection of CD-CBD junction and ligation of CD close to CBD were utilised **RESULTS:** We found cystic duct stones in 87(11.7%) out of 743 Laproscopic cholecystectomies performed. Upon follow up we found that out of 87 patients of detected cystic duct stones, 84(96.5%) patients had no complaints postoperatively upto 2 years while as 2(2.2%) patients had CBD stones (both of them were patients of Mirrizi's syndrome) and one patient had retained cystic duct stone even after milking of the stone to Gall bladder. **CONCLUSION:** We conclude that the incidence of CD stones is underestimated as well as under reported, which is a significant cause of PCS. However if attention is given to CD during Laproscopic cholecystectomy and exploiting some simple and safe maneuvers, they can be effectively dealt with reducing PCS.

KEYWORDS : Laproscopic cholecystectomy, PCS (Postcholecystectomy syndromes), Cystic duct calculi

INTRODUCTION

Laproscopic cholecystectomy represents a significant change in the management of Gall Bladder stone disease and has become the procedure of choice for symptomatic biliary disease^{1,2}. Laproscopic cholecystectomy is still the gold standard treatment for symptomatic cholelithiasis and it relieves the symptoms of gall stone disease in as many as 85% of cases³. The remaining continue to have postcholecystectomy syndromes (10-15%)⁴, the causes of which are often non biliary like peptic ulcer, GERD, IBS, pancreatic diseases, or are biliary like stone in a remnant GB/ CD stump, CBD stones, biliary stricture, and spasm of sphincter of Oddi. The pathogenesis and the risk of biliary causes of PCS are still not well known^{5,7}. The remnant cystic duct calculi is one of the causes of postcholecystectomy syndromes⁸.

Epidemiological evidence suggests that most bile duct stones originate in the gall bladder^{9,10}. The initial stage of which represents passage through cystic duct and thus inability to negotiate the CD or in early stages these calculi are in cystic duct. Multiple small calculi may slip into cystic duct, However first stone is the lead point and risks further stone migration. Patients with history of recent biliary colic, mucocele or intraoperative manipulation of gall bladder during calots dissection may predispose to cystic duct stones¹¹. Most of such stones are missed during surgery and thus continue to give postcholecystectomy syndromes. We represent a series of patients in whom attention towards cystic duct was focussed and different maneuvers exploited for intraoperative management of cystic duct stones whenever detected.

PATIENTS AND METHODS

A prospective study was carried out for 743 patients over a period of 3 years from 2014 to 2016 by a single surgeon and his team. All the patients were subjected to laproscopic cholecystectomy using standard 4-port technique after documentation of GB calculi using ultrasonography for diagnosis.

Intraoperatively attention was focused to cystic duct, its contour, any unusual bulge, tactile feedback using maryland forceps and any undue adhesions.

Different maneuvers were exploited to manipulate cystic duct stones whenever found either back to Gall Bladder or CD-CBD junction was dissected and cystic duct ligated close to CBD. The cystic duct was arbitrarily divided into proximal 1/3, middle 1/3 and distal 1/3. Whole series of patients were followed for a period of 2 years with history and clinical examination and USG hepatobiliary system and LFTs whenever need felt.

Inclusion Criteria:

All patients of cholelithiasis planned for laproscopic cholecystectomy
Patients of acute cholecystitis planned for laproscopic cholecystectomy

Exclusion Criteria:

Patients with cholelithiasis and CBD stones
Patients with preoperative ERCP/MRCP done
Patients in whom subtotal LC was performed
Patients in whom intraoperative cholangiogram was performed
Patients who needed conversion to open cholecystectomy

RESULTS

From 2014 to 2016 we performed 743 laproscopic cholecystectomies. Out of them 520(69.9%) were females and 223(30%) were males. 449(60.4%) were between the age group of 40-50 years, 120(16.1%) were between 30-40 years, 130(17.4%) between 50-60 years and 34(4%) less than 30 years and 66(8%) more than 60 years old. We had 2 cases of hemolytic anemia, a 26 year old female and 21 year old male and one case of 24 years old female of PCOD.

Sixty six percent (66%) of patients were operated for symptomatic cholelithiasis, whereas 26% were operated for Acute cholecystitis and

8% for other reasons.

We found cystic duct stones in 87(11.7%) patients with proximal duct stones in 43 patients, distal stones in 27 patients. 17 patients had stones in the middle part of cystic duct while Mirrizi's syndrome was present in 3 patients. Detected stones were either milked back to Gall bladder using Maryland forceps or complete dissection of cystic duct upto CD-CBD junction and ligation of cystic duct close to CBD. Upon follow up we found that out of 87 patients of detected cystic duct stones, 84(96.5%) patients had no complaints postoperatively upto 2 years while as 2(2.2%) patients had CBD stones (both of them were patients of Mirrizi's syndrome) and one patient had retained cystic duct stone even after milking of the stone to Gall bladder. It was detected by MRCP and later managed by laprotomy. Out of 87 patients of CD stones 34(39%) were patients of acute cholecystitis, 23(26.4%) patients had deranged LFTs, 8(9.1%) patients had mucocele while as 22(25.2%) had no preoperative indication of cystic duct or CBD stones. CD was found to be dilated in 23(26.4%) > 0.5 cm and silk 2-0 was used in 8(9.1%) of patients to ligate the cystic duct instead of titanium clip.

3(3.4%) patients of retained stones, two cases of CBD stones among them were managed by ERCP and one case of CD stump stone by laprotomy. We had minor bile leakage in 2 patients which was managed conservatively by keeping the drain for 7 days.

DISCUSSION

Incidence of cystic duct stones is not that uncommon, however due to usual missing of such stones upon preoperative evaluation and loss of tactile feedback due to widespread use of LC, detection of such stones is difficult if focused attention to the duct is not spared. In 1912, Florcken¹² described the first case of cystic duct remnant containing stones. Zhou et al¹³ found 4 patients with CD remnant stone in a series of 371 patients. The incidence of cystic duct remnant stones after cholecystectomy as such has been reported to be less than 2.5%^{13,14}. However the incidence of cystic duct stones has been reported between 11-20% and thus could be the cause of PCS (postcholecystectomy syndromes) in as many as 25 % of patients¹⁵. We have addressed this group of patients in our series and could find that this reduces the incidence of PCS. Although USG could not detect preoperatively cystic duct stones, we found as many as 87(11.7%) out of 743 patients with CD stones intraoperatively by sparing attention to CD. Patients whose cystic duct was dilated, had an unusual bulge, undue adhesions around calot's triangle were found to have more incidence of cystic duct stones. This incidence is remarkably similar to a study by Mahmud S and his colleagues who had incidence of CD stones of about 12.3%¹¹. Some series have reported incidence of about 19%^{16,17}. Because of difficulty in diagnosis of cystic duct remnant stone, cystic duct stones need intraoperative attention to decrease the incidence of PCS as well as avoiding diagnostic dilemma.

Management of such intraoperatively detected CD stones and intraoperative vigilance can thus decrease the incidence of PCS by utilising some simple and safe maneuvers. Milking of cystic duct towards GB before clipping is one such maneuver. Such maneuver has also been found safe and effective that may reduce the rate of postcholecystectomy pain in addition of giving notice regarding CBD stones and need for intraoperative cholangiography by a study performed by Mohammed Elbalsky et al¹⁷.

Furthermore, the CD should be clipped very close to CBD by complete dissection upto CD-CBD junction. This helps in two ways, any proximal CD stone is removed with specimen and secondly CD stump remnant(>1cm)¹⁸ is prevented, which is also associated with PCS. More frequently the CD stones are proximal and are removed with specimen by default without any specific maneuver or surgeon's attention. However, the distal stones need more attention that are usually missed and may remain with the CD stump. Such stones are more often source of PCS, and thus the need of complete dissection of CD-CBD junction. The probable cause of low incidence of CD stones so far reported is such missed distal CD stones. Retained CD stones can also later on present as CBD stones that may warrant an ERCP. However, CD stones that do not migrate pose difficulty in endoscopic and laproscopic management. The later may be risky in view of local scarring of the area¹⁹ and may thus need laprotomy.

CONCLUSION

We conclude that the incidence of CD stones is underestimated as well as under reported, which is a significant cause of PCS. However if attention is given to CD during Laproscopic cholecystectomy and exploiting some simple and safe maneuvers, they can be effectively dealt with reducing PCS.

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