Original Research Paper Hepatobiliary Surgery

TO STUDY VARIOUS COMPLICATIONS OF OPEN CBD EXPLORATION IN VIEW OF RESIDUAL STONES, BILE LEAKAGE, DIFFICULTY IN REMOVING T-TUBE AND ANY INFECTIONS.

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ABSTRACT An observational study was conducted in Department of General Surgery (MMIMSR), Ambala, on 25 adult patients of choledocholithiasis. They were studied postoperatively by the development of complications associated with T-tube drainage of CBD and complications following T- tube removal. Choledocholithiasis was more common in females with mean age of the patients were48.5±16.8 years. The most common clinical feature was abdominal pain (84.0%). Postoperative complications were observed mostly 4 (16%) patients had postoperative nausea & vomiting followed by bile leakage with 3 (12%). The culture was found positive in 16 (64%) patients. Bile culture should be done routinely in all patients undergoing biliary surgery and antibiotics should be modified depending upon sensitivity report of culture. Cholangiogram is mandatory before removal of T-tube and patients should be observed in hospital after T-tube removal for over a day. Majority of patients developing complications following T-tube removal can be managed conservatively.

KEYWORDS :

Introduction:

Patients presenting with CBD stones have symptoms including biliary colic, jaundice, cholangitis, pancreatitis or may be asymptomatic. CBD stones are one of the medical conditions leading to surgical intervention.[1] CBD stones may be small or large, single or multiple, and are found in 6%-12% of patients with stones in the gall bladder. The incidence increases with age. About 20%-25% of patients above the age of sixty with symptomatic gall stones have stones in the common bile duct.[2] The incidence of recurrent stones may be greater after T-tube drainage because the tube acts as a foreign body around which bile pigments and salts may precipitate. Significant bile leak after T-tube removal can occur in 1-30% of cases.[3] Beside the accidental displacement of the T-tube, failure to remove the T-tube, biliary leakage, duodenal erosion, persistent biliary fistula, biliary peritonitis, chronic discharging sinus, excoriation of the skin, bile duct stricture and cholangitis caused by micro-organisms migrating through the T-tube may prolong hospital stay and delay postoperative recovery .

Material and methods:

This prospective observational study was carried out in Department of General Surgery at MM Institute of Medical Sciences & Research (MMIMSR), Ambala. 25 adult patients of Choledocholithiasis (to the study of complications of open CBD exploration) admitted in various units of Department of General Surgery of the hospital were taken during the study period from August 2015 to July 2017 were studied for this study.

Inclusion criteria:

All the patients undergoing cholecystectomy and open CBD exploration in the various units of department of surgery

Exclusion criteria:

- Patients not giving consent for open CBD exploration.
- Suspected malignancy of biliary tree.

All the patients were studied post-operatively by:

- Pain score:

1. Post-operative day 1:
2. Post-operative day 3:
3. Post-operative day 7:

- Bile output and leakage.
- Fever recording and bile culture sensitivity.
- All the patients underwent T- Tube cholangiogram on about 10-14th day.
- Residual stones, sludge, and leakage of bile were studied.
- Removal of T-Tube was planned after about 3 weeks.
- Any difficulty thereafter was recorded.

All the data collected were statistically analyzed.
Pre-operative informed consent was taken from all the patients.

Observation:

The detailed patient's history and thorough clinical examination were conducted. The mean age of patients was 48.5±16.8 years, though variation in age was 28 to 65 years. Sex ratio (M: F) was 9:16.

Table No 1: Distribution of patients based on their number of stone is made in the table. Majority13 (52%) of patients were had multiple stones followed by single stone in 7 (28%) patients. There were 5(20%) patients had gall bladder stone. Maximum number of patients who had stones was found in 41-50years of age.

Sl No	Age category	Single stone	Multiple stone	Gall Bladder Stone	
1	<30	1 (4.0)	0 (0.0)	0 (0.0)	1 (4.0)
2	31-40	1 (4.0)	2 (8.0)	0 (0.0)	3 (12.0)
3	41-50	4 (16.0)	6 (24.0)	4 (16.0)	14 (56.0)
4	51-60	1 (4.0)	4 (16.0)	1 (4.0)	6 (24.0)
5	>60	0 (0.0)	1 (4.0)	0 (0.0)	1 (4.0)
	Total	**7 (28.0)**	**13 (52.0)**	**5 (20.0)**	**25 (100.0)**

Chart No 1: Distribution of patients based on number of stone

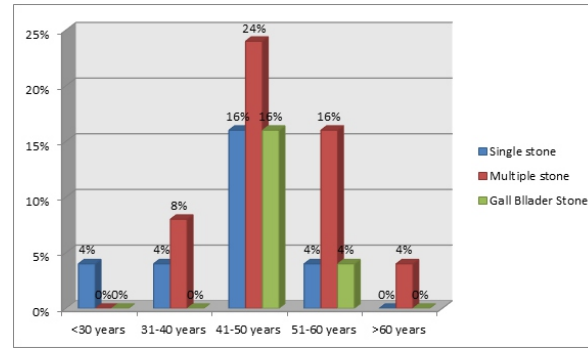


Table No 2: Distribution of patients based on their complications of t-tube drainage is made in the table. Most 4 (16%) patients had postoperative nausea & vomiting followed by bile leakage with 3

(12%), wound infection of 2 (8%), cholangitis of 2 (8%) while only 1 (4%) patient was had peritonitis requiring laparotomy.

	Age category					
Complications	<30	31-40	41-50	51-60	>60	Total
Bile leakage	0 (0.0)	1 (4.0)	1 (4.0)	1 (4.0)	0 (0.0)	3 (12.0)
Postoperative nausea & vomiting	0 (0.0)	1 (4.0)	3 (12.0)	0 (0.0)	0 (0.)	4 (16.0)
Wound infection	0 (0.0)	0 (0.0)	1 (4.0)	1 (4.0)	0 (0.0)	2 (8.0)
Cholangitis	0 (0.0)	0 (0.0)	2 (8.0)	0 (0.0)	0 (0.0)	2 (8.0)
Peritonitis requiring laparotomy	1 (4.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (4.0)
Retained stone	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Chart No 2: Complications of T-tube drainage

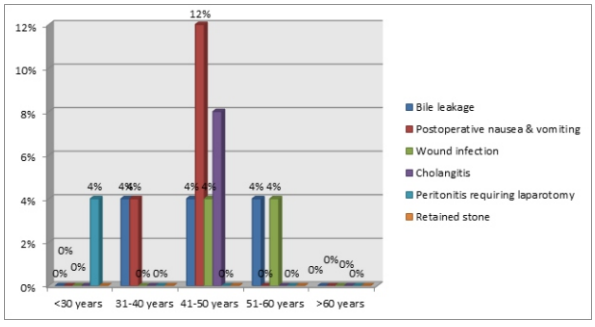


Table No 3: Distribution of patients based on their postoperative T-tube bile culture is made in the table. The culture was found positive in 16 (64%) patients- Ecoli positive in 11 (44%), Klebsiella in 2 (15%) and others were found in 2 cases.

Postoperative T-tube bile culture	**Number of patients (N=25)**		**Number of patients**	**Percentage**
Positive	16	E Coli positive	11	44.0
		Klebsiella	3	12.0
		Others	2	8.0
Negative	9			36.0
Total	**25**			**100.0**

Chart No 3: Showing t tube bile culture

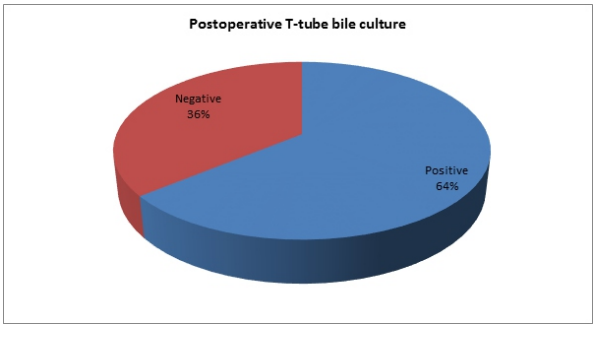
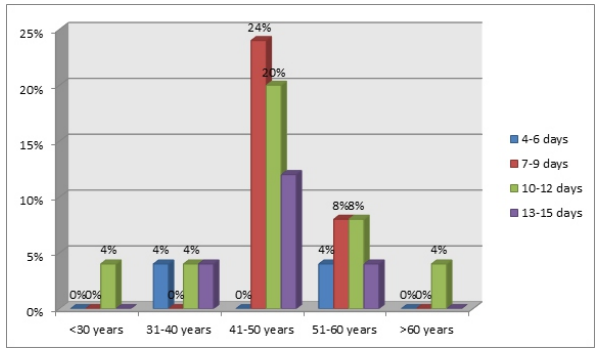


Table No 4: Distribution of patients based on their post-operative hospital stay (in days) is recorded in the table. Majority 10 (40%) of the patients stayed between 10-12 days in the hospital followed by 8 (32 %) patients who were stayed 7-9 days in the hospital and only 2 (8%) patients stayed 4-6 days in the hospital. There were 5 (20%) patients who stayed 13-15 days in the hospital after the operation.

		Hospital stay (Days)				
Sl No	Age	4-6	7-9	10-12	13-15	Total
1	<30	0 (0.0)	0 (0.0)	1 (4.0)	0 (0.0)	1 (4.0)
2	31-40	1 (4.0)	0 (0.0)	1 (4.0)	1 (4.0)	3 (12.0)
3	41-50	0 (0.0)	6 (24.0)	5 (20.0)	3 (12.0)	14 (56.0)
4	51-60	1 (4.0)	2 (8.0)	2 (8.0)	1 (4.0)	6 (24.0)
5	>60	0 (0.0)	0 (0.0)	1 (4.0)	0 (0.0)	1 (4.0)
	Total	2 (8.0)	8 (32.0)	10 (40.0)	5 (20.0)	25 (100.0)

Chart No 4:Post-operative hospital stay (in days)



Discussion: Sample size, Age, and sex wise distribution

	Sample size (Number)	**Mean Age (year)**	**Sex (M: F)**
Present Study (2017)	25	48.5±16.8	9:16
Sharma M et al (2016)	40	46.75± 8.63	1:19
Ambreen M et al4 (2009)	35	46.0± 16.8	1:4
JahanzaibHaider et al5 (2009)	38	41.16±13.48	1:6.6

In our study, the total mean age of all patients was observed 48.5±16.8 years where majority of 14 (56%) patients were 41-50 years of age followed by 6 (24%) of 51-60 years, 3 (12%) of 31-40 years and sex ratio (M: F) was 9:16 recorded is comparable to study done by Ambreen M et al.[4] Females are more prone to males.[4] The incidence of CBD stone increases with age, and higher incidence was found in 4th and 5th decade. Similarly, another study from Pakistan done by JahanzaibHaider et al[5] reported mean age as 41.16±13.48 years and the male to female ratio was 1:6.6.

Marimuthu V et al[6] in their study observed that multiple stones were more common than single stone; out of the 60 cases, 20 (33.3%) had single stone and 40 (67.7%) had multiple stones. In another study by IliyasJuneja et al[7] reported majority 16 (64%) of patients have had the presence of multiple stones while 9 (34%) patients found without stone. In accordance with these studies in our current study, 13 (52%) of patients were had multiple stones followed by single stone in 7 (28%) patients. There were 5 (20%) patients had gall bladder stone. Maximum number of patients who had stones was found in 41-50years of age.

In a study of Sharma M et al[8] complications of T-tube drainage after choledochotomy were noticed in 10 (25%) patients. Pain in abdomen, following T-tube removal, was noticed in 4 patients (10%), vomiting in 2 patients (5%), wound infection requiring dressings in 2 patients (5%), cholangitis in 1 patient (2.5%) and biliary peritonitis following T-tube removal requiring laparotomy was noticed in 1 patient (5%). In a study by Gillatt DA et al [3], the complications associated with T-tube drainage following choledocholithiasis were noticed in 7 (19.4%) patients, 1 (2.7%) patient developed biliary peritonitis and required reoperation, 2 (5.5%) patients developed clinical peritonitis. In another study by IliyasJuneja et al [7] who observed the complications associated with T-tube drainage Cholangitis in 8 (32%) patients, Jaundice in 5 (20%), Asymptomatic in 4 (16%) and Peritonitis only in 1 (4%) patient. In a study by Lygidakis NJ [10] on 105 patients of choledocholithiasis with T-tube drainage, 8 (7.6%) patients had severe pain abdomen following T-tube removal. Similarly, in current study the postoperative complications associated with T-tube drainage reported, most 4 (16%) patients had postoperative nausea & vomiting followed by bile leakage with 3 (12%), wound infection of 2 (8%), cholangitis of 2 (8%) while only 1 (4%) patient was had peritonitis requiring laparotomy.In none of the other cases, problems like Postoperative Jaundice, Retained stones, Recurrence of CBD stones, or Subphrenic abscess were detected or

subsequently reported. AmbreenM et al [4]reported one patient (6.3%) of bile leakage after primary closure, which subsided without any biliary peritonitis as compared to the T-tube group in which two patients (10.5%) had bile leakage. Postoperative jaundice was seen in one patient (5.3%) who had a T-tube because of a blockage of CBD. Not a single patient had a retained stone in both groups as well as no recurrence of CBD stones. Some studies reveal the similar fact of primary closure. Yamazaki et al[11] reported an incidence of 11.7% and 5.8% respectively, and an overall incidence of leakage was reported to be 14.3–38%. No such complication occurred in our patients and no deaths occurred in our study. The reason for this was probably that we used choledochoscopy and did not probe the lower end of the CBD. These measures reduced the risk of biliary leakage. This is comparable to the data seen in the meta-analysis.

The culture was found positive in 16 (64%) patients after open CBD. Similar study was found in study of Sharma M et al[8] out of T-tube bile culture positive of 28 (70%) patients, whereas in 12 (30%) culture negative patients and the incidence of septic complications was recorded positive a total of 9 (32.14%) with pain abdomen following T-tube removal as dominant (10.71%) complication, negative only 1 (8.33%) complication occurred. These findings are also in close agreement with the findings of Chetlin SH and Elliott DW[12], Mason GR et al[13]. In another study by Marimuthu V et al[6] bile culture was positively reported in 19 (31.6%) while E Coli positivity in 12 cases (63.1%), Klebsiella in 4 cases (21%) and Others 3 cases (15.8%). Similarly, in our study, postoperative T-tube bile culture was and reported positive in 16 (64%) patients- Ecoli positive in 11 (44%), Klebsiella in 2 (15%) and others were found in 2 cases and in 9 patients it was found negative. The incidence of septic complications as per T-tube bile culture found positive in 5 (20%) and negative in 1 (4%) patient. In another study was observed commonest organism isolated being E coli followed by Klebsiella.

Conclusion :

Laparoscopic CBD exploration is now replacing open CBD exploration, with the availability of instrument, more of laparoscopic CBD exploration is being carried out replacing open cholecystectomy. Laparoscopic CBD exploration can be performed with high efficiency, minimal morbidity, and mortality. Laparoscopic procedures have advanced over open operations in terms of postoperative morbidity and length of hospital stay. The study thus concludes patients with stones in the biliary tract harbor bacteria in bile. T-tube drainage of CBD carries the risk of infection. ERCP can result in increased incidence of long-term bacterial infection and further these patients are at high risk for developing complications associated with T-tube drainage of CBD. Bile culture should be done routinely in all patients undergoing biliary surgery and antibiotics should be modified depending upon sensitivity report of culture. Every effort should be done to prevent internal spillage of bile during surgery to prevent the development of postoperative sepsis. Cholangiogram is mandatory before removal of T-tube and patients should be observed in hospital after T-tube removal for over a day. Majority of patients developing complications following T-tube removal can be managed conservatively.

Conflict of interest: **Nil.**

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