

A Comparative Study of Primary Common Bile Duct Closure vs T-Tube Drainage After Open Common Bile Duct Exploration At TMMC&RC Moradabad

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Abstract

Background: There are two ways for extracting the common bile duct stones which includes Endoscopic retrograde cholangiopancreatography and a surgical method through the laparoscopic or open method. The placing of T - tube is associated with having a prolonged length of hospital stay that is always more than 10 days. Also there has been a less incidence of the recurrent stones that got reported in terms with the primary closure of the CBD while it gets compared with the drainage of the T - tube. This study was a comparative study carried out in the patients of Uttar Pradesh in regards to the primary common bile duct closure versus the T - tube drainage after there is the exploration of the common bile duct. **Subjects and Methods:** Inclusion Criteria are Age more than 18 years, Patients with large CBD stones presenting with symptoms of obstructive jaundice who have either had failed ERCP, or have refused ERCP, Large and impacted stones. Exclusion Criteria are pancreatic pathology, Recurrent CBD stones, Renal failure, Malignancy, all the cases declared unfit by the anesthesiologist for the surgery. **Results:** The majority of the cases were female which accounts for 84.1% and only 15.9% of them were male. Majority of the cases suffered from a severe pain in their abdomen which accounted for 63.6%, 31.8% of clinical jaundice and only 4.5% experienced fever with the pain abdomen. 81.8% got diagnosed with choledocholithiasis and only 18.2% of them were found to have cholelithiasis along with choledocholithiasis. After the 14th day the representation of the distribution of frequency in accordance with the T tube cholangiogram showed that the result was positive in 50% and negative in 50%. None of the patients had any retained stones in them and 90.9% of the cases did not face any T- tube site infection post the treatment and only 4 of the patients had faced the infection in T- tube site. The Bile leak post the removal of T tube which was done after 3 days shows that the majority of the cases did not report any incidence of bile leak that accounted for 88.6% and only 5 subjects had experienced bile leak. **Conclusion:** Primary common bile duct closure can be considered to be a safer and much more effective way for managing the open common bile duct exploration in regards to the common bile duct stones.

Keywords: Endoscopic Retrograde Cholangiopancreatography, Common Bile Duct.

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Introduction

The disease of gallstone is one of the common problems that is the digestive tract and the prevalence of the same in India is noted to be approximately 4%. There are two ways for extracting the common bile duct stones which includes Endoscopic retrograde cholangiopancreatography and a surgical method through the laparoscopic or open method. Injuries of the bile duct have been linked with some of the upper abdominal operations along with the procedures of biliary tract, but various methods for extracting the stone from the Common bile duct is being used and the commonest one of them is endoscopic extraction procedure.^[1,2] The surgical extraction can either be the open surgical procedure or the laparoscopic procedure. The most readily accepted practice is insertion of T-tube at post

choledocholithotomy.^[3,4] The therapeutic modality is also related to the heightened incidence of the wound sepsis and cholangitis. Even after the removal of the T-tube some cases encounter leakage of bile. Usually T - tube drainage is being recommended by depending over the premises that it will be providing a post-operative decompression along the CBD which would produce an obstruction of out flow allowing the radiological visualisation of the common bile duct which will be liberating potential route to extract any of the stones that is being retained.^[5,6] The duration of the drainage of the T - tube is also variable in nature which can be ranging from 7 days to 45 days as it depends over the preference of the individual. This method has been challenged before more than a century and after that several researchers have also challenged the utility of the T tube. Depending on some randomised Trials the benefit of having the primary closure method is over the insertion of T - tube. Significant amount

of leakage occurs after the removal of T - tube and can take place from 1 % to 30% of the cases. Sometimes the incidence of having recurrent stones can be higher than that of the drainage of T - tube as the tube starts acting like a foreign body and around it the bile pigments as well as the salts might be precipitating.^[7,8]

Some external loss of the leakage of bile can also take place through the T - tube that can give arise to Slow rate of wound healing, Constipation, Post choledochotomy acidotic syndrome and Anorexia. Sometimes the incidence of having recurrent stones can be higher than that of the drainage of T - tube. Some of the previous reports have also felt that choletocotomy in terms of stone extraction can also be completed through the insertion of the tto.

While being compared with the T-tube drainage the primary closure seems to have its own advantages.

The postoperative decompression in terms of CBD should be responsible for the outflow obstruction that takes place.

Allowing the radiological visualisation of the CBD which is a potential route to extract when there is any retained stone.

The placing of T - tube is associated with having a prolonged length of hospital stay that is always more than 10 days. The debate has been going on since age old times from the laparoscopic method and the huge number of surgeons favouring the primary closure. The widely available choledochoscopy along with the ERCP has highly decreased the incidence of the retained stones of bile duct. However, in spite of having the proper advantages, the performance of primary duct closure is not being done in a routined manner. Also there has been a less incidence of the recurrent stones that got reported in terms with the primary closure of the CBD while it gets compared with the drainage of the T - tube.

All these above-mentioned facts and previous research were the main reason that why a comparative study was needed to be carried out over the patients of Uttar Pradesh in regards to the primary common bile duct closure versus the T - tube drainage after there is the exploration of the common bile duct.

AIM

A Comparative Study of Primary Common Bile Duct Closure Vs T-Tube Drainage after Common Bile Duct Exploration at TMMC & RC Moradabad

Objectives

- To study the outcome with insertion of a t-tube for drainage after open common bile duct exploration for common bile duct stones.
- To study the outcome with primary CBD closure after open common bile duct exploration for common bile duct stones.
- Then comparing the two techniques.

Subjects and Methods

This study was a Prospective and Observational in nature, that was carried out in the Department of General Surgery at Teerthanker Mahaveer Medical College, Moradabad. The patients coming to the OPD were included in the study after

taking and informed consent from them. The patient history along with all the needed details were recorded and the patients were divided into two groups based on the treatment modalities for research purpose and generating the results.

Inclusion Criteria

1. Both sex. Age more than 18 years
2. Patients with large CBD stones presenting with symptoms of obstructive jaundice who have either had failed ERCP, or have refused ERCP.
3. Large and impacted stones.

Exclusion Criteria

1. Pancreatic pathology
2. Recurrent CBD stones
3. Renal failure
4. Malignancy
5. All the cases declared unfit by the anesthesiologist for the surgery.

Results

The frequency distribution of Gender, where 84.1% were found in Female and 15.9% were found in Male [Table 1].

Table 1: Represent the frequency distribution of the cases according to Gender.

Gender	Frequency	Percent
F	37	84.1
M	7	15.9

Table 2: Represent the frequency distribution of cases according to Signs & Symptoms

Signs & Symptoms	Frequency	Percent
Clinical jaundice	14	31.8
Fever with pain abdomen	2	4.5
Pain in abdomen	28	63.6

The frequency distribution of Signs & Symptoms, where 31.8% subjects were found in clinical jaundice, 4.5% subjects were found in fever with pain in the abdomen and 63.6% were found in pain in abdomen.

Table 3: Represent the frequency distribution of the cases according to USG W/A.

USG W/A	Frequency	Percent
Cholelithiasis	36	81.8
Cholelithiasis with Cholelithiasis	8	18.2

[Table 3] shows the frequency distribution of USG W/A, where 81.8% subjects were found in cholelithiasis and 18.2% subjects were found in cholelithiasis with cholelithiasis.

Table 4: Represent the frequency distribution of cases according to TLC.

TLC	Frequency	Percent
Normal	43	97.7
Slightly raised	1	2.3

[Table 4] shows frequency distribution of TLC, where 97.7% subjects were found in Normal and 2.3% subjects

were found in Slightly raised.

[Table 5] shows the distribution of Retained stones, where 100% subjects were found in No.

Table 5: Represent the frequency distribution of Retained stones.

Retained stones	Frequency	Percent
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No	44	100.0
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Table 6: Represent the frequency distribution of T Tube site infection.

T Tube site infection	Frequency	Percent
No	40	90.9
Yes	4	9.1

Table 7: Comparison of Mean between T tube drainage (Group A) and Primary closure (Group B).

Parameters		T tube drainage (Group A)		Primary closure (Group B)		P-Value
		Mean	Std. Deviation	Mean	Std. Deviation	
Done	Age	40.50	16.87	38.55	14.77	0.684
	MRCP (CBD dia)	14.66	1.06	14.50	1.08	0.622
	T. Bilirubin	2.59	0.85	2.91	1.19	0.311
	SGOT/SGPT	104.23	34.16	106.00	31.85	0.860
	ALP	124.00	47.49	125.59	36.82	0.902
	Subhepatic drain	17.68	7.66	19.41	9.47	0.509
	Hospital stay	15.50	2.37	5.64	1.09	0.000
No	Age	38.55	14.77	40.50	16.87	0.685
	MRCP (CBD dia)	14.50	1.08	14.66	1.06	0.623
	T. Bilirubin	2.91	1.19	2.59	0.85	0.311
	SGOT/SGPT	106.00	31.85	104.23	34.16	0.860
	ALP	125.59	36.82	124.00	47.49	0.902
	Subhepatic drain	19.41	9.47	17.68	7.66	0.509
	Hospital stay	5.64	1.09	15.50	2.37	0.000

(To compare the Mean between T tube drainage (Group A) and Primary closure (Group B), we used independent t-Test)

[Table 7] shows the comparison of Mean between T tube drainage (Group A) and Primary closure (Group B), the difference in Mean Hospital Stay were found Significant as the P-value is <0.05.

Table 8: Association of parameters of T tube drainage (Group A) and Primary closure (Group B)

Parameters		T tube drainage (Group A)		P-Value	Primary closure (Group B)		P-Value
		Done	No		Done	No	
Gender	Female	16	21	0.039	21	16	0.039
	Male	6	1		1	6	
Signs & Symptoms	Clinical Jaundice	4	10	0.032	10	4	0.032
	Fever With Pain Abdomen	0	2		2	0	
	Pain In Abdomen	18	10		10	18	
USG W/A	Choledocholithiasis	17	19	0.434	19	17	0.434
	Cholelithiasis With Choledocholithiasis	5	3		3	5	
TLC	Normal	22	21	0.312	21	22	0.312
	Slightly Raised	0	1		1	0	
T tube cholangiogram (After 14th Day)	No	0	22	.000	22	0	.000
	Yes	22	0		0	22	
Retained stones	No	22	22	---	22	22	---
	Yes	0	0		0	0	
T Tube site infection	No	18	22	0.036	22	18	0.036
	Yes	4	0		0	4	
Bile leak after T tube removal (after 3 days)	No	18	21	.154	21	18	.154
	Yes	4	1		1	4	
post op fever	No	22	20	.148	20	22	.148
	Yes	0	2		2	0	

(To find the Association of parameters of T tube drainage (Group A) and Primary closure (Group B), we used Chi-Square Test)

[Table 8] shows the Association of parameters of T tube drainage (Group A) and Primary closure (Group B), The Association in Gender, Signs & Symptoms, T tube cholangiogram (After 14th Day) and T Tube site infection were found Significant as the P-value is <0.05

Discussion

It was observed that the majority of the cases were female which accounts for 84.1% and only 15.9% of them were male. These findings were similar to that with the study of

the researchers Zhang et al. who also observed that in their study 77.8% of the cases were females. It was noticed that majority of the cases suffered from a severe pain in their abdomen which accounted for 63.6%, which was followed by 31.8% of clinical jaundice and only 4.5% of the cases experienced fever along with the pain in their abdomen. Similar results were noticed by the researchers Cai et al, as maximum of the subjects in their study also reported an unbearable pain across their abdomen that was found in 71.3% of the cases.^[2] The majority of the subjects i.e. 81.8% got diagnosed with choledocholithiasis and only 18.2% of

them were found to have cholelithiasis along with choledocholithiasis.^[8] As per their TLC, the majority of the cases were found to be in normal situations which accounted for 97.7 % and only one patient had it in slightly raised condition. Similar to the researchers Khaled et al,^[8] who had also noticed that the majority of the subjects in their study belong from the normal TLC group which accounted for 95%.^[9] While representing the frequency distribution of the cases as per the drainage of T tube for group A, half of the cases had and the other half did not and it was similar for the cases of primary closure i.e., group B, where again half of the cases had done it. Following that all the cases were found to have experienced the Intra op. choledocscopy. After the 14th day the representation of the distribution of frequency in accordance with the T tube cholangiogram showed that the result was positive in 50% and negative in 50%. None of the patients had any retained stones in them and 90.9% of the cases did not face any T- tube site infection post the treatment and only 4 of the patients had faced the infection in T- tube site.^[10] The Bile leak post the removal of T tube which was done after 3 days shows that the majority of the cases did not report any incidence of bile leak that accounted for 88.6% and only 5 subjects had experienced bile leak. While comparing with the study of other researchers such as the study carried out by Yi et al,^[11] have shown that the stone recurrence rate was observed in both the groups of primary closure and t - tube drainage and the values were 4.4% in 5.9% accordingly. Their study had also noticed a postoperative bile leak that had been experienced by 2.2% of the cases from the primary closure group and 2% of the patients from T - tube group. Only 4.5% of the cases in this study had reported postoperative fever and the remaining majority of the subjects, i.e., 95.5% did not show any fever.

The representation of the cases as per their mean age value over here shows that it was 39.5 to along with the standard deviation of 15.7. The age group and the mean age were almost similar in the study which was carried out by the researchers Mangla et al,^[12] who had 40.3 as the mean age value. The next table of this study represented the mean of the subjects as per the MRCP (CBD dia), came up to be 14.58 along with the standard deviation of 1.05. According to the representation of T. Bilirubin, the mean value was noticed to be 2.75 along with the standard deviation of 1.03. The mean value of this bilirubin was almost similar to that of the researchers Yin et al, as it came up to be 3 with the standard deviation of 1.25.^[11] The mean value for the SGOT/SGPT was noticed to be off 105.11 along with the standard deviation of 32.65. The mean value of ALP that was noticed to be 124.80 along with the standard deviation of 42. As per the mean value of Subhepatic drain, it came up as 18.55 along with the standard deviation of 8.555.^[13] The mean value of the subjects as per their stay in hospital was 10.57 days along with a standard deviation of 5.31. While comparing with the study of the researchers Huang et al,^[14] it was found that the length of the hospital stay was 7 days for their study group which included the cases who had underwent the laparoscopic primary closure in regards to CBD while compared with the control group which included cases experience in the laparoscopic choletocolithotomy in terms of the T- tube placement which was for 10 days. The

mean values of the t tube drainage of group A to that with the primary closure of group b with the help of Independent t-Test. Results have shown that only the P value of the mean difference of the length of the hospital stay came up to be statistically significant as it was 0.0001 which is less than 0.05. The mean value of the hospital stay in the first group was 15.50 whereas in the primary closure group or the second group was 5.64 so definitely it is clear from the mean values that there is a high difference between both the groups in regards to the time spent in hospital.^[15] The last table of the study showing the Association between the parameters of the tube drainage to that with the primary closure that has shown that Association of Gender, Signs & Symptoms, T tube cholangiogram (After 14th Day) and T Tube site infection shows the pre value to be statistically significant as the values were 0.039, 0.032, 0.000 and 0.036 respectively and all of them were less than 0.05. The remaining parameters did not show any Association between both the groups.

Conclusion

It can be concluded from the results that the primary common bile duct closure can be considered to be a safer and much more effective way for managing the open common bile duct exploration in regards to the common bile duct stones. The length of the postoperative stay in the hospital was much lower in primary closure technique rather than the tube drainage thus it helps to reduce the cost of the hospital post treatment. Also the primary closure technique helps the patience to get back to their daily activities quickly as the healing process is faster.

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