DOI: 10.14260/jemds/2014/2768

ORIGINAL ARTICLE

T-TUBE APPLICATION AFTER CBD EXPLORATION IS NOT ALWAYS NECESSARY: A STUDY

Purujit Choudhury[1]

HOW TO CITE THIS ARTICLE:
Purujit Choudhury. "T-Tube Application after CBD Exploration is not Always Necessary: A Study". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 23, June 09; Page: 6481-6485,
DOI: 10.14260/jemds/2014/2768

ABSTRACT: BACKGROUND: Routine application of supraduodenal T-tube after choledochotomy is absolutely not necessary. T-tube application gives various complications with high morbidity and reported cases of mortality and increases hospital stay. Materials and methods-Primary closure of CBD following choledochotomy is studied on 457 cases of choledocholithiasis and biliary ascariasis with CBD diameter less than 2.5cms. Most of the cases had 1-3 stone that didn't require much manipulation during extraction. The choledochotomy wound were closed by single layer of interrupted 3-0 vicryl suture. **RESULT**: Post-operative period was uneventful except transient jaundice which subsided within few days in some cases. Most of the patients were discharged after 2-3 days. Conclusions-Primary closure of choledochotomy is routinely advocated due to many fold advantages and T-tube is considered to be applied in a very special situation.

KEYWORDS: Choledocholithotomy, Choledocholitiasis, Ascariasis, Primary closure, T-tube, Stone, CBD.

INTRODUCTION: Routine drainage of CBD by T-tube [Fig. 13] following choledochotomy is unnecessary as it prolongs hospital stay and increases post-operative morbidity. The choledochotomy wound can safely be closed primarily after CBD exploration. The use of T-tube is associated with complication like bile leak, dislodgement and even breaking of the T-tube, duct stricture, cellulites around the T-tube, cholangitis and trauma to duct and subsequent biliary leak during tube removal and delayed healing of the CBD wound. The continuous external drainage of bile can sometimes lead to nutritional disturbance. Primary closure of CBD after choledochotomy is the option of choice in most of the cases.[1]

MATERIALS AND METHODS: 457 cases were studied during the period of 2007-2012 [Fig-1, 2]. Female were 338 (74%) and male were - 119(26%). Age group is 22 -66 years (Mean-45.7 years). The cases were selected on the basis of preoperative ultrasonography though 47(10%) cases were required for CT study. The CBD diameter less than 2.5cms and solitary CBD stone though 109 patients (24%) had multiple (1-3) stones [Fig-4, 5] which could be extracted easily, were the patients in this study. 79 patients had sludge with gross dilatation was subjected for choledochotomy.

Vigorous manipulation due to retain, impaction or multiple stones of distal CBD are excluded from this study. Biliary ascariasis [Fig. 6, 7, 8]; patients with no history of previous biliary surgery; patients with no evidence of papillary stenosis or retained stones (confirmed by palpation, saline irrigation and bougie incorporation); no evidence of acute pancreatitis and acute cholangitis were other criteria's to select the cases.177 (39%) cases had worm (1-4 in no) in the CBD. These are closed primarily.[1] No comparative study is included in the present analysis. By 3-0 vicryl primary closure of supraduodenal choledochotomy [Fig. 3] wound of all the patients were closed by interrupted single

DOI: 10.14260/jemds/2014/2768

layer suture of 3-0 vicryl.[3] Before closing the wound irrigation by normal saline through Ryle's tube keeping stay suture cross to each other to make water tight and introduced bougie to look its free access into the duodenum for any residual stones was done.

RESULTS AND OBSERVATIONS: Mean operation time is 55.82 minutes; analgesics needed for 1-3 days; post-operative fever and wound infection –Nil; hospital stay -2-8 days (most of the patients were kept for 2-3days); morbidity-3-5% and mortality -Nil; post-operative follow up in 1, 3, 6, 9 and 12 months revealed uneventful status and most particularly retained stones, biliary stricture and related symptoms which were confirmed by ultrasonography. 44 (9.63%) patients developed post-operative jaundice [5,6] due to more manipulation subsided within 2-4 days after operation. 23 (5.03%) patients developed biliary leak (30-40ml/24hrs) which were subsided within 3-5 days.

DISCUSSIONS: T-Tube application after CBD exploration is recommended in:

1. Post-operative decompression due to outflow obstruction.
2. Post-operative T-tube cholangiogram [Fig-9, 10] to visualize CBD for residual stones if any.
3. Potential for T-tube extraction of retained stones (Burrhenn technique).
4. Multiple stones with vigorous CBD and ampullary manipulation.

But routine application of choledochoscopy or completion cholangiography plus the availability of ERCP for stone extraction have reduced those indications of T-tube. Moreover good clinical analysis in both pre and per-operative state can easily exclude any retained or missed stones if CBD do not have multiple stones.[3] When T-Tube is applied the consequences eventually arises are:

- Organisms grows in bile despite intra-operative bile culture showed no organisms if applied T- Tube.
- Peritubal bile leak.[2]
- Wound infection when on T-Tube.
- Rapidly necrotizing fasciitis of the abdominal wall and septicaemia shock leading to death when on T-Tube. (Reported in few literatures).
- Biliary peritonitis following T-tube removal. The T-tube tract is used to put another drain in the peritoneal cavity for biliary drainage. The patients responded to conservative treatment and bile leak ceased spontaneously on the 19th post-operative day.
- T- Tube dislodgement or occlusion and fluid and electrolyte imbalance.
- Hospital stay -12-20 days if on T-Tube [Fig.13].
- Morbidity - 40% in comparison to around 5.5% following primary closure. (Indian Journal of Gastroenterology, 2004; Vol-23; Issue-6; 227-228.
- Mortality –up to 5% had been reported. (Indian Journal of Gastroenterology, 2004; Vol-23; Issue-6; 227-228.[6]
- Analgesic used – up to 5-15 days if on T-Tube.
- Fever.
- Post-operative ileus.
- Chest infection.
- Bile leak following T-tube removal -1.3-30%.[2]
- Bile duct injury following T-tube removal.

DOI: 10.14260/jemds/2014/2768

- Encrustation leading to difficult removal or failure to remove. GA may be necessary in certain cases.[6]
- External loss of bile through the T-tube may lead to slow wound healing, anorexia and constipation (Postcholedochotomy acidotic syndrome).
- T-tube act as a foreign body around which bile pigments and bile salts may ppt and hence recurring stone - (Reinl off WF published in Ann. Surg 1960; 151:255-71).
- Delayed cholangitis and stone formation due to retained T-tube fragments.
- Cellulites around T-tube, stricture, injury to CBD during removal may lead to vasomotor collapse, neurogenic shock and may cause death.

CONCLUSIONS: The use of routine T-tube application following choledochotomy is absolutely unnecessary. It increases post-operative morbidity and mortality. Primary closure of CBD is more safe and physiological [7] [Fig-11]. It is the procedure of choice following routine choledochotomy. It is considered the best procedure in non-dilated CBD [Fig-12]. Post-operative transient jaundice in some cases is due to inflammation and reactive cholangitis subsides within a couple of days. Hospital stay is dramatically reduced following primary closure. Considering those facts primary closure after choledochotomy is procedure of choice in most of the cases.[8]

BASIC OF THE ARTICLE: T-Tube application is not a mandatory procedure after CBD exploration. Primary closure of CBD is advocated by many surgeons. Choledochoduodenostomy is the best option when CBD is dilated.

REFERENCES:

1. Sealea. K (1999): Primary CBD closure; Arch Surg134: 22-24.
2. Gharaibeh. K. I. A, et al (2000): biliary leakage following T-tube removal; Int Surg 85: 57-63.
3. Awyers. J. L, et al (1965): Primary closure of the CBD; Am J Surg, 109: 107-12.
4. Mirrizzi. P. L (1942): Primary closure of CBD in choledocholithiasis; Arch Surg, 44: 44-54.
5. Moreaux. J et al (1995): Traditional surgical management of CBD stones: A prospective study; Am J Surg, 169: 220-226.
6. Gillant. D. A, Long staff. A.J (1985): Complications of T-tube drainage of the CBD; Ann R Col Surg, 67: 170-171.
7. Reinhoff. W. F (1960): Primary closure of CBD; surg, 151: 255-61.
8. Ryu. D et al (2003): Comparison between primary closure of CBD and T-tube drainage after choledochotomy; Korean J Hepatobiliary Pancreat Surg, 7(1): 119-123.

Figure 1

DOI: 10.14260/jemds/2014/2768

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

DOI: 10.14260/jemds/2014/2768

Figure 10

Figure 11

Figure 12

Figure 13

AUTHORS:

1. Purujit Choudhury

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Surgery, Gauhati Medical College.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Purujit Choudhury,
P. O. Gopinath Nagar (Arya Path),
House No. 39, Arya College,
Girls Hostel Road (Sarabvati),
Near Dr. B. Bauah Cancer Hospital.
E-mail: drpurujit@yahoo.in

Date of Submission: 29/04/2014.
Date of Peer Review: 30/04/2014.
Date of Acceptance: 26/05/2014.
Date of Publishing: 09/06/2014.