

Original Article

Exploration of common bile duct for treating hepatic cystic echinococcosis

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Abstract: Objective: To compare the clinical efficacy of exploration of common bile duct through cystic duct or T type tube in CE patients. Methods: One hundred and fifty six patients with chronic CE received decompression of biliary tract from January 2007 to December 2012 were included. Exploration of common bile duct was performed through cystic duct (n=102) or T type tube (n=54). Psychological reactions were monitored including inconvenient position alteration due to carrying of the drainage tube, anxiety of the folding and prolapse of drainage tube, folding of the drainage tube, and any pain during the body position change. Results: No significant difference was noticed in the body position alteration discomfort in both groups ($P>0.05$). Statistical difference was noted in the anxiety of folding and prolapse of draining tube ($P<0.05$), and improvement of the clinical symptoms ($P<0.05$). Conclusions: A higher possibility of wound, enlarged tube-carrying duration, and lower sense of discomfort, were noticed in patients underwent exploration of common bile duct through T type tube. Higher sense of comfort was reported in patients received exploration of common bile duct through cystic duct tube.

Keywords: Liver, cystic echinococcosis, drainage tube, nursing

Introduction

Echinococcosis is a zoonotic disease reported worldwide [1]. In China, most of the infected population was distributed in the northwest of China mainland, especially in the Xinjiang Uygur Autonomous Region [2]. To date, two major types of echinococcosis were reported in the Xinjiang autonomous region, including cystic echinococcosis (CE) and alveolar echinococcosis (AE), of which CE was most common in human and animals with liver as the major affected organ. Although surgery has been well acknowledged in treating hepatic cystic echinococcosis (CE), its clinical efficacy is limited due to early local recurrence and cavity-related complications such as postoperative biliary fistula [3].

Ever since 2002, we have devoted to the prevention of postoperative biliary fistula using the biliary drainage technique. In our previous study, exploration of common bile duct through

T type tube was used for the treatment of patients with hepatic hydatid disease underwent surgery [4]. Even though it is acceptable in the drainage of biliary fistula, the technique has been related to severe complications. In this study, exploration of common bile duct through cystic duct was performed for the drainage of biliary fistula, and compared with the efficiency of that using T type tube for treating hepatic cystic echinococcosis combined with biliary fistula.

Materials and methods

Patients

A total of 156 patients with chronic CE willing to receive decompression of biliary tract from January 2007 to December 2012 in the Department of Liver Transplantation and Laparoscopic Surgery were included in this study. The inclusion criteria were: those diagnosed with CE; and those concurrent with biliary fistula and willing to receive repairing of biliary

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Table 1. Comparison of inconvenience of position alteration and anxiety caused by prolapse or folding in both groups

Group	N	Group A	Group B	χ^2	P value
Inconvenience of position alteration					
With	148	97	51	0.0422	0.8372
Without	8	5	3		
Anxiety about the prolapse of draining tubes					
Yes	106	84	22	28.0727	0.0000
No	50	18	32		

Table 2. Comparison of clinical efficacy for Group A and Group B (Univariate Logistic regression)

	Variables	B	S.E.	Wald	df	Sig.	Exp (B)
Step 1 ^a	Inconvenience of position alteration caused by drainage tubes	-0.132	0.751	.031	1	0.860	0.876
	Constant	-.511	0.730	.489	1	0.484	0.600
Step 1 ^a	Anxiety about the prolapse or folding of draining tubes	-1.915	0.380	25.441	1	0.000	0.147
	Constant	0.575	0.295	3.814	1	0.051	1.778
Step 1 ^a	Presence of any discomfort due to draining tubes	-3.761	0.511	54.072	1	0.000	0.023
	Constant	1.099	0.289	14.483	1	0.000	3.000
Step 1 ^a	Dragging pain during the body position alteration	1.137	0.350	10.563	1	0.001	3.117
	Constant	-1.194	0.255	21.879	1	0.000	0.303
Step 1 ^a	prolapse of draining tube	-2.185	0.756	8.367	1	0.004	0.112
	Constant	-0.379	0.180	4.446	1	0.035	0.684

^aVariables were entered in step one as follows: inconvenience of position alteration caused by drainage tubes, anxiety about the prolapse or folding of draining tubes, presence of any discomfort due to draining tubes, dragging pain during the body position alteration, and prolapse of draining tube. B is the estimated logit coefficient. S.E. is the standard error of the coefficient. Wald = [B/S.E.]². df is degree of freedom. Sig is the significance level of the coefficient. Exp(B) is the "odds ratio" of the individual coefficient.

ary fistula. The exclusion criteria were those total pericystectomy or partial hepatectomy; those with severe cardiopulmonary disorder; and those with postoperative organ disorders. Written informed consents were obtained from each patient. The protocols were approved by the Ethic Committee of First Affiliated Hospital of Xinjiang Medical University.

Treatment

Exploration of common bile duct through cystic duct was performed in 102 patients (male: 61, female: 41, with an average of 36.4 yrs) with severe biliary fistula using a soft ventricular drainage tube, while exploration of common bile duct through T type tube was carried out in 54 patients (male: 31, female: 23, with an average of 40.4 yrs) with mild and/or moderate biliary fistula with a T tube. The tube-carrying duration in both groups was ranged from 15~30 days (median duration of 20.2 days).

The patients underwent exploration of common bile duct through cystic duct were required to lie in a comfortable position. Subsequently, the drainage band was lead out from the abdomi-

nal bandage and was fixed with the margin of the bed using a pin. Regular disinfection was carried out together with the alternation of the drainage facility. At the same time, the volume and color of the content was recorded cautiously. A surgical clamp was used to dilate the duct if the diameter of the cystic duct is narrower than the tube.

For the patients underwent exploration of common bile duct through T type tube, the same procedures were performed. Nevertheless, as the volume of the drainage was comparatively larger than that of the cystic duct group, the drainage band should be changed in a promptly manner.

Treatment efficacy

The fixing of drainage tube was compared in both groups. Meanwhile, identify any folding or prolapse presented in any patient. Also, the psychological reaction of patients and clinical symptoms in both groups were assessed, including inconvenient position alteration due to drainage tube, anxiety of the folding and pro-



Figure 1. Exploration of common bile duct through cystic duct or T type tube for cystic echinococcosis. A. A tiny and soft tube was used for the exploration of bile duct through cystic duct tube. Multiple ligation was needed to prevent the prolapse of the tube. B. Exploration of bile duct through T type tube. The tube was comparatively thick and tough. The tube was fixed using a T-type arm, and was hard to be prolapsed.

lapse of draining tube, folding of the drainage tube, and any pain during the body position change. The follow up duration of the patients lasted for 1~3 months.

Statistical analysis

Blind review was performed by the staff in the Epidemiology and Health Statistics Institution, Xinjiang Medical University. Measurement data and enumeration data were analyzed by Chi-square test. Wilcoxon rank sum test was carried out for the analysis of ranked data. SPSS17.0 software and PEMS 3.1 software were used for the data analysis. Two-sided tests were performed for all the statistical tests. $P < 0.05$ demonstrated statistical difference.

Results

Inter-group comparison of psychological reaction

A total of 156 patients were enrolled in this study. In Group A, a total of 102 patients (male: 61, female: 41, with an average of 36.4 yrs) were enrolled. In Group B, 54 patients (male: 31, female: 23, with an average of 40.4 yrs) were enrolled. No significant difference was noticed in the patient information at the baseline levels ($P > 0.05$). No significant difference was noticed in both groups at the terms of uncomfortable position alteration ($P > 0.05$, **Table 1**). Nevertheless, statistical difference was noted in the anxiety of the folding and prolapse of draining tube in both groups ($P < 0.05$, **Table 1**).

Comparison of clinical symptoms

The sense of comfort, dragging pain during the body position alternation and the folding or prolapse of drainage tubes were compared between the two groups. Chi-square test indicated: (i) a superior sense of comfort was reported by the patients underwent exploration of common bile duct through cystic duct compared with those through a T type tube (84.2% vs 11.1%, $\chi^2 = 78.1995$, $P = 0.0000$); (ii) less dragging pain was noticed during the body position alternation in patients underwent exploration of common bile duct through cystic duct compared with those through a T type tube (34.3% vs 62.9%, $\chi^2 = 11.7483$, $P = 0.0006$); and (iii) higher incidences of folding or prolapse of drainage tubes were noticed in patients underwent exploration of common bile duct through cystic duct compared with those through a T type tube (25.4% vs 3.7%, $\chi^2 = 11.3796$, $P = 0.0007$). During the follow-up, prolapse of the drainage tube was reported by two patients, fortunately, no severe adverse reactions were noticed during the follow up.

Comparison of clinical efficacy in Group A and Group B

Univariate logistic regression analysis was performed to analyze the correlation between the clinical efficiency and potential factors, including inconvenience of position alteration caused by drainage tubes, anxiety about the prolapse or folding of draining tubes, presence of any discomfort due to draining tubes, dragging pain

during the body position alternation, as well as folding or prolapse of draining tube in both groups. Statistical difference was noticed including anxiety about the prolapse or folding of draining tubes, presence of any discomfort due to draining tubes, dragging pain during the body position alternation, folding or prolapse of draining tube in both groups ($P<0.05$, **Table 2**).

Discussion

In this study, a comparative study was carried out to investigate the clinical efficacy of exploration of common bile duct through cystic duct or T type tube in the patients with no indications of radical excision.

No significant difference was noted in the incidence rates of inconvenience of position alteration compared with the patients underwent exploration of common bile duct through a T-type tube (95.1% vs 94.4%, $P>0.05$). A higher tube-carrying comfort was noted in patients underwent exploration of common bile duct through cystic duct tube compared with those through T type tube (84.3% vs 11.1%, $P<0.05$). However, a new challenge was available for the nursing of the drainage. For example, anxiety of the folding and prolapse of draining tube was frequently reported in the patients underwent exploration of common bile duct through cystic duct tube compared with those using a T type tube (82.4% vs 40.7%, $P<0.05$). Indeed, the incidence of folding and prolapse of the draining tube in the cystic duct tube group was higher than that of the T type tube group. For the dragging pain induced by the insertion of the tube, a lower rate was noted in patients with exploration of bile duct through cystic duct tube compared with those using a T type tube (34.3% vs 63.0%, $P<0.05$).

According to our clinical experiences, attention should be paid to guarantee the smooth drainage and the fixation of the drainage tube. In our department, multiple ligations were always carried out as revealed in **Figure 1A** to decrease the prolapse of the drainage tube. However, how to avoid the folding of the tube is still a great challenge, which caused great demands to the clinical nursing. Therefore, the following measures were taken in a positively manner: Firstly, the patients and the attendants were well informed about the clinical application of the drainage tube and routine nursing. Secondly, effective communication was carried

out during the daily ward-round. Also, in presence of any prolapse, immediate fixation was carried out. According to our clinical experiences, the joint of drainage tube and drainage band on skin was fixed on the skin tissues of the patients, based on which to prevent the occurrence of folding and prolapse. For the carrying of the drainage tube, a pin could be used to fix the drainage tube on the bedsheet when the patients were lying on bed. It could increase the relative length of the drainage tube, and reduce the inconvenience of the body alteration. If the patients were in a movement, the drainage tube could be fixed on the clothes using a pin to facilitate the movement [5, 6]. Besides, an additional tube-carrying period (about 15~30 days) was needed even after discharge for each patient. On this condition, regular administration of medicine was required to prevent postoperative infection. It was reported that drainage tubes of two patients (3.7%) prolapsed after discharge with no severe outcomes fortunately. Usually, the majority of patients needed no biliary decompression when discharge. Meanwhile, tubes were closed during the hospitalization by the clinical physicians, and fixed on part of skin with carbasus or abdominal bandage.

T tube biliary decompression was a common method for biliary decompression [7, 8], which was mainly used for biliary tract diseases, including calculus of common bile duct and suppurative cholangitis [9]. Patients with CE always reported concurrent biliary complications, which caused great demands to the clearance of the biliary duct. On this condition, flexible and tiny rubber tube was applied for the decompression of the biliary duct (**Figure 1B**). During the follow up, folding of the drainage tube was only reported in 2 patients with dissatisfactory fixation of the abdominal bandage. Compared with those received exploration of common bile duct through cystic duct tube, reduced anxiety of tube folding and/or prolapse was reported in patients underwent exploration of common bile duct through T type tube (**Table 1**). Nevertheless, a higher incidence of dragging pain and discomfort was reported in those with exploration of common bile duct through T type tube.

For the clinical nursing of patients carrying drainage tube, adequate attention should be paid to the psychological guidance and educa-

tion to decrease the discomfort and fear of pain. At the same time, full cooperation between physicians and the patients or attendants should be established to decrease the patient's discomfort. For example, it is necessary to distract the patients through watching TV, listening to the music and deep breath. Moreover, special attention should be paid to the margin of the wound in particular conditions such as cough. In addition, we should be careful with nursing procedure in case of pain caused by drainage tube movement. It is necessary to improve the life quality and nursing quality of the patients [10]. As T type tubes were easy to be folded, which always resulted in subsequent obstruction of the tube, the tubes were fixed with abdominal bandage to abate patients' discomfort during the movement. Moreover, drainage tube was replaced daily, during which the drainage volume and color was observed. After discharge, a further tube-carrying period of 15~30 days was still needed together with periodic disinfection.

In conclusion, the folding of the drainage tube is still a great challenge for the nursing of the patients underwent exploration of bile duct through cystic duct tube or T type tube. No significant difference was noted in the incidence rates of inconvenience of position alteration compared with the patients underwent exploration of common bile duct through a T-type tube. A higher tube-carrying tolerance was noted in patients underwent exploration of common bile duct through cystic duct tube compared with those received exploration of common bile duct through T type tube.

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Disclosure of conflict of interest

None.

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