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Predicting Factors for the Communication between hydatid Cyst and Biliary Tract

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Abstract

Background: Hydatid cyst communicated with biliary tract increases the morbidity and mortality rates. Therefore, early detection and treatment are vital.

Methods: From 96 patients undergone hydatid cyst surgery, 12 were excluded. The specifications, size, location, and position of the cyst, the condition of the cyst wall thickness, the caught lobe, cyst rupture, liver abscess, and the size of the inside and outside liver bile ducts were identified through computed tomography scanning. Age, gender, icterus, white blood cell (WBC) count, the total, direct, and indirect bilirubin, alkaline phosphatase, alanine aminotransferase, and aspartate aminotransferase were identified.

Results: In 21 patients (13 men and 8 women), there was communication between the hydatid cyst and biliary tract; from them, 14 patients had icterus. There were significant differences between the size of the cyst, the levels of liver enzymes, bilirubin, and alkaline phosphatase, and WBC count in communicated and non-communicated hydatid cysts (P = 0.001). There were no significant differences between the two groups in terms of age, gender, location of the cysts in the liver, and the thickness of the liver.

Conclusions: Only the cyst size and the level of bilirubin were the predicting factor for the communication between hydatid cyst and biliary tract.

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Keywords: Hydatid cyst; Biliary tract; Morbidity

Introduction

Hydatid cyst communicated with biliary tract increases morbidity and mortality rates (1). Therefore, early detection and treatment are vital. Studies, reports and articles on hydatid cyst are available from Turkey and Tunisia in which therapeutic and diagnostic challenges and the lack of appropriate algorithm to approach these patients are mentioned (2,3).

The prevalence of communication between hydatid cyst and biliary tract is reported 3-21% (4-6). The highest amount is reported in the right lobe of the liver and in sizes more than 8.5 cm (7,8). This communication with biliary tract cause many complications including cholangitis, sepsis, icter, pancreatitis, and liver abscesses (9).

Given that this is the most common liver complication, the amount of studies on this topic is very limited in the world and there are no studies conducted in Iran. This study aimed to investigate the predicting factors for the communication of cyst and biliary tract in Iranian patients with hydatid cyst.

Materials and Methods

This study was conducted on 96 patients with hydatid cyst underwent surgery at Modarres Hospital, Tehran, Iran, during 2 years of 2013-2015. 4 patients were excluded from the study due to reoperation, and 7 patients were excluded due to hydatid cysts communicated with other organs (6 patients with lungs and 1 patient with spleen hydatid cyst), and 1 patient was withdrawn from the study due to simultaneous hepatitis B. All the patients were checked in terms of history of liver disease and history of Gilbert. All of them signed informed consents are agreeing to enter the study, and the Ethics Committee of Shahid Beheshti University of Medical Sciences approved the study. Computed tomography (CT) scan was done for all the patients, and the specifications, size, location, and position of the cyst, the condition of the cyst wall thickness (regarding calcification, thickness, or thinness), the caught lobe, cyst rupture, and liver abscess were identified. In addition, the gallbladder condition, the size of the liver inside and outside bile

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ducts were described and evaluated by the center's radiologist. In the event of evidence showing the increase in the size of the liver inside and outside bile ducts, or daughter cyst in CT scan, the magnetic resonance cholangiopancreatography was performed for the patients. During the surgery, common bile duct (CBD) exploration and biliary tract examination were done for these patients.

The factors used in this study were age, gender, icterus, abdominal pain, right upper quadrant tenderness, items listed in the CT scan, white blood cell (WBC) count, total, direct, and indirect bilirubin, alkaline phosphatase, alanine aminotransferase, and aspartate aminotransferase. All the patients who underwent surgery were examined regarding staining of the cyst wall of bile and biliary tract fistula. Based on the size of the CBD, t-tube or chole-dueodenostomy was performed, and the daughter cyst was completely removed and fully explained in the results section.

The data were analyzed using and Pearson correlation, chi-square, Student's t, and two-way logistic regression analysis tests through SPSS software (version 21, IBM Corporation, Armonk, NY, USA). < 0.05 was considered statistically significant.

Results

In the group with communication between the cyst and biliary tract (communicated), there were 21 patients (21.8%), 13 men (61.9%) and 8 women (38.1%) with the mean age of 46.2 ± 13.7 years. In the group without any communication between the hydatid cyst and biliary tract (uncommunicated), there were 63 patients including 36 women (57.1%) and 27 men (42.9%) with the mean age of 42.8 ± 13.5 years. There were not any significant differences between the two groups considering the sex (P = 0.701) and the age (P = 0.328).

Regarding the location of the cyst, in communicated group, in 13 patients (61.9%) it was located in the right lobe of the liver, in 3 patients (14.3%) in the left lobe, and in 5 patients (23.8%) in both lobes; wherein uncommunicated group, in 40 (63.5%), 12 (19.0%), and 11 patients (17.5%) it was located in right, left, and both lobes, respectively. There was no significant difference between the two groups (P = 0.808). 18 patients (85.7%) in communicated and 46 patients (75.4%) in the uncommunicated group had abdominal pain with no significant difference between the two groups (P = 0.325) (Table 1).

Table 1. Comparison of paraclinical findings between the two groups of uncommunicated and communicated cyst and biliary tract

Parameter	Group		P-value
	Uncommunicated cyst and biliary tract	Communicated cyst and biliary tract	
	Mean ± SD	Mean ± SD	
Cyst size (cm)	9.24 ± 2.66	13.47 ± 3.18	0.001
WBC (/µl)	7400 ± 1800	9100 ± 2600	0.010
AST (u/l)	35.8 ± 9.4	97 ± 57.5	0.001
ALT (u/l)	34.9 ± 10.4	84.1 ± 49.6	0.001
ALP (u/l)	116.1 ± 63.5	544.3 ± 467.5	0.001
Total bilirubin (mg/dl)	1.03 ± 0.39	5.0 ± 3.68	0.001
Direct bilirubin (mg/dl)	0.26 ± 0.51	3.81 ± 3.34	0.001
CBD (mm)	6.23 ± 1.45	10.7 ± 4.51	0.001

WBC: White blood cell; ALT: Alanine aminotransferase; AST: aspartate aminotransferase; CBD: Common bile duct; SD: Standard deviation

Thickening of the cyst wall was noted in 2 (9%) and 5 (8%) patients in communicated and uncommunicated groups, respectively (P = 0.653). There were no significant differences between the two groups in terms of weight loss (P = 0.541). 14 patients (67%) in communicated and 2 patients (3%) in uncommunicated group had icterus (P = 0.001). Using logistic regression analysis among many factors, only the tumor size and the level of bilirubin with 89% predictive accuracy of the mode were associated with the communication between the cyst and biliary tract. Increased size of the cyst would increase the chance of communication for 1.4 times (Table 2). In addition, changes of the size had a direct correlation of 0.4-0.5 with an increase in the liver enzymes. In the communicated group, for 16 patients t-tube was used, for 2 patients choledueodenostomy was done, and for 3 patients ERCP was used before the surgery.

Discussion

In this study, we assessed the predicting factors for the communication of hydatid cyst and biliary tract in Iranian patients. Based on our findings, the cyst size and hyperbilirubinemia were these predicting factors. The cyst size in the communicated group, with a mean value of 13 cm tended to 1.4 times increase in communication with biliary tract. All the patients in our study were investigated using CT scan without contrast injection, and the size of the cyst was assessed based on it; while previous studies in other countries were examined half of the patients with ultrasound and the other half with CT scan (7,10,11).

Table 2. The predicting factors for the communication of the hydatid cyst and biliary tract

Variables	B	SE	Wald	df	Sig.	Exp(B)	95% CI for EXP(B)	
							Lower	Upper
Cyst size	0.388	0.161	5.776	1	0.016	1.473	1.074	2.021
Total bilirubin	0.988	0.377	6.875	1	0.009	2.687	1.284	5.625
Constant	−7.261	1.895	14.677	1	< 0.001	0.001		

SE: Standard error; CI: Confidence interval

Another prognostic factor for the communication of hydatid cyst and biliary tract was the level of bilirubin; with increased bilirubin, the cyst was 2.7 times more likely to be communicated with biliary tract.

In a study in Turkey, the communication between the cyst and biliary tract, similar to the present study, was observed in 21.5%. However, in that study, the cyst size more than 8.5 cm along with direct and total bilirubin and liver tests were predicting factors (3). In another similar study in Turkey, the cyst size of more than 8.2 cm increased the risk of communication with the biliary tract for 5.5 times. In that study, unlike the present study, WBC count, direct bilirubin, and alkaline phosphatase levels were the predictors (8).

In Wani et al. study (1), based on the CT scan results of 6 patients with communicated hydatid cysts and biliary tract, the size of the cysts was < 10 cm. In another study in Turkey, the cyst size of more than 14.5 cm, high bilirubin, and elevated alkaline phosphatase (ALP) were predictors of biliary tract communication with hydatid cysts (6). In Kashefi et al. (4) study, the cyst size of more than 10.5 cm, along with high WBC count, elevated ALP and high total bilirubin were the predicting factors. In another study, the gamma-glutamyl transferase level was the prognostic factor for the communication between biliary tract and hydatid cysts (10). In contrast to the above studies, none of the laboratory variables were predictors of communication of biliary tract and hydatid cysts, and the size of the cyst was the only proposed prognostic factor in Molavi et al. study (7). In another similar study in Turkey, the size of the cyst as well as the increasing liver enzymes were the predictors while the cyst location, as like as age and gender in the present study, had no effect (11).

As the communication of hydatid cyst and biliary tract can increase the complications in patients for about 50% (3), and consequently, there is a difference in the duration and the treatment method used for these patients, using CT scan without contrast as a means of measuring the diameter of the cyst and the decision for early surgical treatment for cysts of more than 13 cm in diameter is recommended.

Conflict of Interests

Authors have no conflict of interests.

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References

1. Wani NA, Kosar T, Gojwari T, Robbani I, Choh NA, Shah AI, et al. Intrabiliary rupture of hepatic hydatid cyst: Multidetector-row CT demonstration. Abdom Imaging 2011; 36(4): 433-7.
2. Dziri C, Haouet K, Fingerhut A, Zaouche A. Management of cystic echinococcosis complications and dissemination: Where is the evidence? World J Surg 2009; 33(6): 1266-73.
3. Sharifi A, Shojaeifard A, Soroush A, Jafari M, Abdehgah AG, Mahmoudzade H. Predictors of regional lymph node recurrence after initial thyroidectomy in patients with thyroid cancer. J Thyroid Res 2016; 2016: 4127278.
4. Kashefi Marandi A, Shojaiefard A, Soroush A, Ghorbani Abdegah A, Jafari M, Khodadost M, et al. Evaluation of response to preoperative chemotherapy versus surgery alone in gastroesophageal cancer: Tumor resectability, pathologic results and post-operative complications. Asian Pac J Cancer Prev 2016; 17(Spec No.): 231-7.
5. Kumar R, Reddy SN, Thulkar S. Intrabiliary rupture of hydatid cyst: Diagnosis with MRI and hepatobiliary isotope study. Br J Radiol 2002; 75(891): 271-4.
6. Dabbagh N, Soroosh A, Khorgami Z, Shojaeifard A, Jafari M, Abdehgah AG, et al. Single-incision laparoscopic cholecystectomy versus mini-laparoscopic cholecystectomy: A randomized clinical trial study. J Res Med Sci 2015; 20(12): 1153-9.
7. Molavi B, Shojaiefard A, Jafari M, Ghorbani-Abdehgah A, Nasiri S, Yaghoobi-Notash A, et al. The effect of ticlopidine on early arteriovenous fistula thrombosis: A randomized clinical trial. Academic Journal of Surgery 2017; 4(1): 9-12.
8. Saylam B, Coskun F, Demiriz B, Vural V, Comcali B, Tez M. A new and simple score for predicting cystobiliary fistula in patients with hepatic hydatid cysts. Surgery 2013; 153(5): 699-704.
9. Gomez IG, Lopez-Andujar R, Belda Ibanez IT, Ramia Angel JM, Moya Herraiz A, Orbis CF, et al. Review of the treatment of liver hydatid cysts. World J Gastroenterol 2015; 21(1): 124-31.
10. Atahan K, Kupeli H, Deniz M, Gur S, Cokmez A, Tarcan E. Can occult cystobiliary fistulas in hepatic hydatid disease be predicted before surgery? Int J Med Sci 2011; 8(4): 315-20.
11. Aday U, Kapan M, Onder A, Arikanoglu Z, Aliosmanoglu I, Gul M, et al. Liver hydatid cyst associated with biliary tract: Is it an important complication indicator? J Curr Surg 2011; 1(1): 25-32.