Pak. J. Chest Med. 2022;28(02)

Original Article

journal homepage: https:/www.pjcm.net/

Pakistan Journal of Chest Medicine

Official journal of Pakistan Chest Society

A comparison of Open Surgery and Minimum Invasive Surgery in terms of recurrence of Hydatid Cyst in Lung and Liver

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Article History:

Received:	Jan 10, 2022
Revised:	April 18, 2022
Accepted:	May 16, 2022
Available Online:	June 02, 2022

Author Contributions:

SK JA conceived idea, JA drafted the study, SK collected data, SK JA did statistical analysis and interpretation of data, both critical review manuscript and approved final version to be published.

Declaration of conflicting interests

The authors declare that there is no conflict to interest.

How to cite this article:

Khalil S, Alam J. A comparison of Open Surgery and Minimum Invasive Surgery in terms of recurrence of Hydatid Cyst in Lung and Liver. Pak J Chest Med 2022; 28(2):60-64

ABSTRACT

Background: The recurrence of hydatid cyst in liver and lung, after open and minimum invasive surgery, is most commonly reported. In this study, the patients who underwent open surgery (OS) or minimum invasive surgery (MIS) for hydatid cyst in the liver and lung prospectively followed to assess their comparative recurrence.

Methodology: This prospective cohort study was conducted between February 2018 and July 2020 at Hayatabad Medical Complex, Peshawar, Pakistan. The patients who underwent open surgery (OS) or minimum invasive surgery (MIS) for hydatid cyst in the liver and lung and having age greater than 18 years was included in the current study. A regular postoperative follow-up plan was implemented. The outcome of variables for the current study was the recurrence of the hydatid cyst. Statistical analysis was carried out using a statistical package for social science (SPSS v26).

Results: A total of 63 patients were recruited for the current study. The mean age of the patient in the OS group was 43.83 ± 6.21 years, while in the MIS group was 46.75 ± 5.32 years. The liver cyst was high in both groups (p=0.37). There was no significant difference in the recurrence in both groups. (p=0.47). The reoccurrence rate was higher in the MIS group than in the OS group. Most of the cysts recurred within two years.

Conclusion: This study showed that the frequency of recurrent hydatid cyst was higher in the MIS than in the OS. Most of the hydatid cysts reoccurred within two years in the current study.

Key words: Open Surgery; Minimum Invasive Surgery; Hydatid Cyst

Introduction

Hydatid cyst is a parasitic infection prevalent in many parts of the globe, including the Mediterranean region, Iran, India, Australia, and South America. According to the World Health Organization (WHO), the yearly incidence of Cystic Echinococcus in certain countries might reach 220 per 100,000 people.

Hydatid (liver/lung) disease is a zoonotic disease caused by Echinococcus granulosus (EG). This parasite uses humans as intermediate hosts. It often affects individual or multiple human organs, most notably the liver and lungs. In most cases, the hydatid cyst develops slowly and asymptomatically, even though some cysts may reach to 20 cm in diameter. While in some cases it develops serious complications such rapture of the cyst, anaphylactic reaction, and pressure symptoms. The treatment goal for this disease is the removal of cyst followed by preservation of healthy tissue, and avoidance of recurrence by preventing cystic fluid spoilage and dispersion of cyst contents.[1,2]

Open surgery including thoracotomy and laparotomy approach is the initial and best treatment option for massive, multiple, or complicated lung and liver cysts, respectively. Although, it is a painful and associated with prolong hospital stay, but the benefit of these techniques is the removal of cysts together with damaged tissue without its rupture.[3-5]

The minimum invasive surgery (MIS) including Video-assisted thoracoscopic surgery (VATS) and laparoscopic surgery is the advance and popular procedure for management of hydatid cyst. The previous literature regarding MIS is limited, which may be due to the high risk of postoperative complications such as cyst rupture, cystic fluid spoilage.[6-9]

In this study, the patients who underwent open surgery (OS) or minimum invasive surgery (MIS) for hydatid cyst in the liver and lung prospectively followed to assess their comparative recurrence.

Methodology

This prospective cohort study was conducted between February 2018 and July 2020 at Hayatabad Medical Complex, Peshawar, Pakistan. The patients who underwent open surgery (OS) or minimum invasive surgery (MIS) for hydatid cyst in the liver and lung and having age greater than 18 years was included in the current study. The included patients were divided into two groups. The first group comprised patients who underwent open surgery (OS group) for hydatid cyst in the liver or lung. In comparison, the second group was

Table 1. Demographics and cyst recurrent profile of the patients

Baseline characteristics		Surgery type		P-value
		OS	MIS	
		n (%)	n (%)	
Age (mean±SD)		43.83±6.21	46.75± 5.32	0.05
Gender	Male	21 (56.8)	16 (43.2)	0.81
	Female	14 (53.8)	12 (46.2)	
Site of the cyst	liver	25 (59.5)	17 (40.5)	0.37
	Lung	10 (47.6)	11 (52.4)	
Reoccurrence	Yes	3 (42.9)	4 (57.1)	0.47
	No	32 (57.1)	24 (42.9)	
Recurred at (month) (mean±SD)		15.11± 2.69	17.64± 2.30	<0.0001
Re-operation required	Yes	1 (50.0)	1 (50.0)	0.87
	No	34 (55.7)	27 (44.3)	
Recurrence site	Liver	2 (50.0)	2 (50.0)	0.71
	Lung	1 (50.0)	1 (50.0)	
	other	0 (0)	1 (100)	

OS – Open Surgery, MIS – Minimum Invasive Surgery

composed of patients who underwent minimum invasive surgery (MIS) including laparoscopic and video-assisted thoracoscopic surgery for hydatid cyst in liver and lung (MIS group). The patients in each group were followed for two years to assess the recurrence of the hydatid cyst in the liver and lung. The outcome of variables for the current study was the recurrence of the hydatid cyst.

A regular postoperative follow-up plan was implemented. In the twenty-four postoperative months, we employed an indirect hemagglutination test for echinococcosis (IHA) and abdominal ultrasonography. IHA, and ultrasound were conducted after 6, 12, and 18 months. Any ultrasound-based suspicion of recurrence was verified by computed tomography (CT). In patients with recurrence, the time of recurrence, location of the new cyst, and surgical intervention, were assessed.

Statistical analysis was carried out using a statistical package for social science (SPSS v 26). The data were explored for missing data. Descriptive statistics were used to present the categorical data as frequency and percentage, and scale data as a mean and standard deviation. The inferential statistics assessed the difference between dependent and independent variables. The p-value was considered significant at 0.005 level.

Results

A total of 63 patients were recruited for the current study. The mean age of the patient in the OS group was 43.83 ± 6.21 years, while in the MIS group was 46.75 ± 5.32 years. The liver cyst was high in both groups (p=0.37). There was no significant difference in the recurrence in both groups. (p=0.47). A total of 7 patients presented with a recurrence of the cyst, among which four, two, and one cyst recurred in the liver, lung, and other sites, respectively. The detail

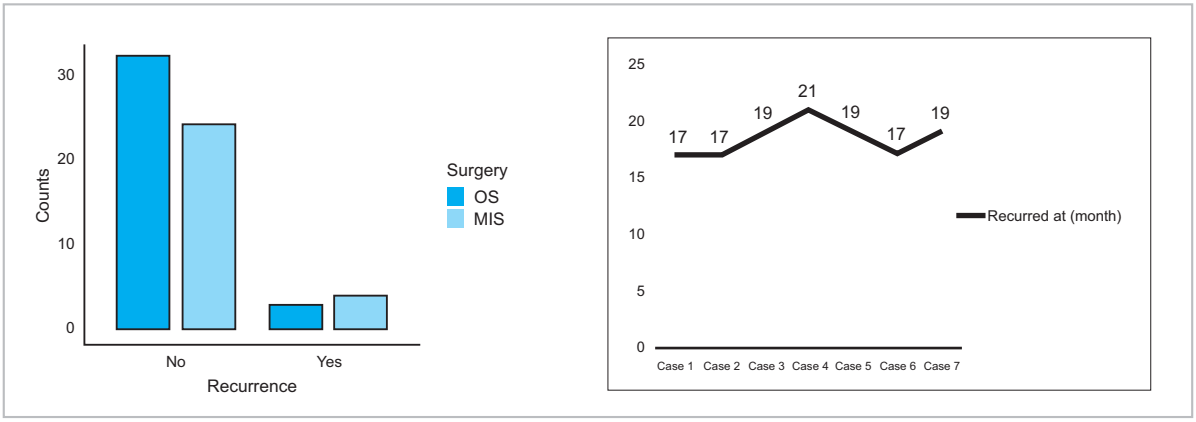

Figure 1: Recurrence of the cyst.

can be seen in Table 1.

The reoccurrence rate was higher in the MIS group than in the OS group. Most of the cysts recurred within two years, as shown in figure 1.

Discussion

The current study assesses the recurrent liver and lung hydatid cysts in OS and MIS. This study showed that the frequency of recurrent hydatid cysts was higher in the MIS than in the OS. Most of the hydatid cysts recurred within two years.

In our study, the recurrent hydatid cyst was high in the MIS group. There is relatively little published research regarding MIS in complicated hydatid cyst, and they are restricted to a very small number of patients.[6,9-11] This is owing to the possibility of cystic rupture and the leakage of its contents during surgery, resulting in future recurrence, as well as the difficulty in regulating the accompanying bronchial fistulas, communication with biliary tree and residual cavities, which raises complication rates and prolongs hospital stay.[12] In addition, the systematic administration of preventive pharmacological treatment with Albendazole following surgery had contributed to the prevention of recurrence, which in certain trials had approached nil.[11,13] However, in several of these investigations, a small follow-up length (about six months) was insufficient to identify all occurrences of recurrence.[8,10]

To determine the nature of the cyst, its association with the biliary system, vascular structures, and other organs, as well as the extent of compensatory hyperplasia, we routinely used CT scans on patients who were scheduled for a second operation.[14] The choice of treatment (radical

or conservative) was determined by cyst location, size, morphology, consequences (infection or biliary obstruction), past therapy, and the existence of adhesion-related technical problems. Given that the suitable initial therapy has failed due to the parasite's "vitality," a more extreme treatment may be necessary. Complete cyst resection may look rational in patients with recurrence after the evacuation of cyst contents, provided the procedure is performed safely. However, these radical surgeries are technically more challenging, and reoperations have a greater risk of morbidity and mortality.[15] Due to adhesions in the subsequent surgeries, recurrence looked to exacerbate technical issues. This conclusion is consistent with previously reported 10 percent fatality rates. In most recurrence instances, we favored cautious therapy (repeat evacuation with or without partial cystectomy). Achieving satisfactory long-term palliation was preferable to the risk of death resulting from overzealous efforts at a complete cure with drastic excisions. First, complications, including infection and biliary blockage, were managed. In addition, unlike recurrent malignant illness, recurrent hydatid disease advances slowly and is seldom life-threatening; hence, not all patients must be treated.[16]

This study was subjected to various limitations. The small sample size can compromise the external validity, so further study should be conducted with larger sample size. Secondly, the follow-up duration of the current study was two years; therefore, it may hinder the prolonged complications.

Conclusion

Majority of the complications resulted from insertion of a chest tube with trocar. Thus, using chest tubes with trocars should be avoided by the in-experienced consultants. Mistakes in dealing with the thoracostomy tube and its system are commonly being practiced, mainly by the residents and the nurses, due to inadequate knowledge and poor experience.

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