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Surgical treatment and outcome of the hydatid cyst: A study from a tertiary care center in Nepal

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Abstract
Introduction: Hydatid cyst is commonly encountered in Nepal with different clinical presentation. Surgery is the treatment of choice. For H. cyst of lung, beside standard thoracotomy Video assisted Thoracoscopy Surery (VATS) has equally good outcome.
Method: This was a retrospective, descriptive study of duration of 5 years from 2017 to 2021, conducted in Department of General Surgery of Bir Hospital, National Academy of Medical Sciences, Nepal.
Result: Out of 43 patients (age 14 – 63years), most common presenting symptom was cough (48.84%), 16.28% were asymptomatic. Patients were treated with standard thoracotomy (72.09%) and VATS (11.63%) with commonest complication of pneumothorax (6.98%), recurrence in (2.33%) having mortality of (2.33%).
Conclusion: H. cyst is commonly encounter in Nepal. Surgery is the treatment of choice. For the treatment of the pulmonary H.cyst VATS is safe having good result.

Keywords: Hydatid cyst, Mortality, Thoracotomy, VATS

Introduction

Hydatid disease, known in times of Galen, was described by Thebesius in the 17th century. It is thought to have originated in Iceland and to have been brought to continental Europe by dogs accompanying whalers in the 18th century. Infestation is confined to geographic areas in which there is continuous contact between humans and certain domestic carnivores such as dogs, cats and sheep. Echinococcosis is endemic to the Mediterranean region, South America, Australia, New Zealand, the Middle East, Alaska and Canada [1, 2].

Human is an incidental host and contracts the disease from water or food or by direct contact with dogs. Once the eggs reach the stomach, the hexacanth embryos are released. They pass through the intestinal wall and reach the veins of the liver where they develop into the hydatid. If they overcome the hepatic obstacle, they may become lodged in the lung, and may remain in any organ to which they are carried by the bloodstream [3]. The fully developed cysts are composed of three layers. The outer layer, or pericyst, is composed of inflamed fibrous tissue derived from the host; the exocyst is an acellular laminated membrane; and the innermost layer, or endocyst, is the germinative layer of the parasite and gives rise to brood capsules (secondary cysts), which bud internally [4].

Imaging studies, combined with immunodiagnostic techniques, often help to make a diagnosis [5]. Chest xray and Ultrasonography (USG) is the initial imaging modality of choice because it is easy to perform, widely available, and inexpensive and can help define the number, site, size, and vitality of cysts [6]. Antibody assays can add weight to the presumptive imaging diagnosis. However, a negative serologic test rarely rules out echinococcosis.[7] Computed tomography (CT) scan and magnetic resonance imaging can help diagnose deep-seated lesions and determine the extent and condition of the avascular fluid-filled cysts [8].

Surgical treatment is considered the treatment of choice since the parasite can be completely removed. The surgical options for lung cysts include lobectomy, wedge resection, pericystectomy, intact endocystectomy and capitonnage [9]. During surgery it is important to minimise spillage of cyst contents in order to prevent intraoperative dissemination and eventual recurrence. This may be accomplished by the delivery of intact cyst or by cystic fluid aspiration with or without the use of a scolicidal solution and preoperative therapy with albendazole. Puncture, aspiration or injection of a helminthicide and reaspiration has been advocated for hepatic cysts. However, for pulmonary cysts, this technique shows more complications and is rarely indicated [10]. The minimally invasive treatment of pulmonary hydatid disease was first

introduced in 1994 by Becmeur and colleagues The feasibility of the procedure has been proven by others [11]. Alpay *et al.* demonstrated that, VATS treatment of pulmonary hydatid disease was superior to thoracotomy causing lower pain, shorter operation time, lower chest tube drainage volume and shorter chest tube duration [12].

Aim of this study is to evaluate the clinical presentation, management and the outcome of the patients with Hydatid cyst of the lung associated with liver who were admitted in the Cardio thoracic and vascular surgery department of the Bir hospital Nepal.

Method

This is a retrospective descriptive study of patients who were treated for Hydatid cyst in National Medical sciences, Bir Hospital, Nepal. The duration of the study was 5 years from January 2017 to January 2021, in Cardio Thoracic and Vascular surgery, Department of General Surgery, National Academy of Medical Sciences, Nepal. All patients were from the rural population, with common symptoms such as cough and chest pain and a history of contact with dogs or sheeps. The diagnosis was established through routine chest radiography and ultrasonography (thoracic and/or abdominal) and computed tomography (CT) scans. Dermal tests, complementary fixation tests and indirect haemagglutination were not used. All operations were performed under general anaesthesia via a posterolateral thoracotomy approach. In cases of associated H.cyst of liver laparotomy was performed. In all cases, Cystotomy and capitonnage were preformed. Surgical technique Posterolateral thoracotomy through the fifth, sixth or seventh intercostal space was accomplished with the patient in the lateral decubitus position. The thoracotomy wound and the lung, apart from the area containing the cyst, were covered with sponges moistened with 10% povidone iodine to prevent inadvertent implantation of scoleces or daughter cysts. With needle aspiration, hydatid fluid was aspirated from the cyst to lower the intracystic pressure. Then, a suction apparatus was introduced into the cyst and the fluid was completely aspirated. No scolicidal agent was used. The needle and suction apparatus insertion site were enlarged by cutting the pericystic layer (host tissue) with an electrocautery so that the germinative membrane was easily taken out and the bronchial cystic cavity exposed. After the removal of the germinative layer, the residual cavity was carefully cleaned and irrigated with 10% povidoniodine in all patients. The cavity was obliterated by purse-string sutures using the Polypropylene 3-0 round body suture material (capitonnage). All cysts were subjected to histopathological examination, which confirmed the diagnosis.

Result

Total of 43 patients with hydatid cyst were treated surgically in CTVS department in the duration of 5 years in NAMS, Bir hospital, Nepal. Out of witch 20 (46.51%) were male and 23 (53.49%) were female. The youngest patient was 14 years old and the oldest was 66yers old.

Table 1: Age and Gender Distribution among Patients of Hydatid Cyst n=43

Variables	Frequency	Percentage
Age		
11-20 years old	5	11.63
21 -30 years old	9	20.93
31-40 years old	16	37.21
41-50 years old	5	11.63
51-60 years old	5	11.63
61-70 years old	3	6.98
Gender		
Male	20	46.51
Female	23	53.49

The most common presenting symptom was cough 48.84%, however 16.28% patients were asymptomatic. Two patients (4.65%) presented with coughing out cystic fluid material.

Table 2: Presenting symptoms of patients with Hydatid cyst

Symptom	Frequency	Percentage
Cough	21	48.84
Chest pain	9	20.93
Dyspnoea	4	9.30
Coughing out cystic fluid material	2	4.65
Asymptomatic	7	16.28

Thirty one (72.09%) patients were treated with open thoracotomy with cystotomy and capittonage. We attempted VATS with cystotomy and capittonage in 8 patients. We succeed in 5 (11.63%) and we had to convert to open thoracotmy in 3 (6.98%) cases.

Table 3: Types of surgery performed for patients with Hydatid cyst

Types of surgery	Frequency	Percentage
Thoracotomy (Cystotomy + Capittonnage)	31	72.09
VATS Cystotomy + Capittonnge)	5	11.63
VATS converted to open thoracotomy	3	6.98
Thoracotomy + Laparotomy	4	9.30

Table 4: Post surgery complication of patients with Hydatid cyst there were 8 (18.60%) cases of morbidity in our study. The most common was pneumothorax 3 (6.98%). There was one (2.33%) case of recurrence. There was a 1 (2.33%) mortality due to anaphylactic shock.

Complication	Frequency	Percentage
Pneumothorax	3	6.98
Bronchopleural fistula	2	4.65
Empyema	1	2.33
ICU + Ventillator	1	2.33
Recurrence	1	2.33
Mortality	1	2.33

Discussion

Echinococcus granulosus is spread almost all over the world, especially in areas where sheep are raised, and is endemic in Asia, North Africa, South and Central America, North America, Canada and the Mediterranean region. It is also frequently encountered in Nepal. The commonest site is liver followed by lung as in the other countries where H. cyst is common [2].

Intact or simple hydatid cysts of the lung have no characteristic symptoms. Their clinical manifestations depend on the site and size of the cyst. The diagnosis of an intact hydatid cyst is usually based on a suspicion resulting from an unexpected finding on routine chest radiographs. Radiography allowed an accurate

diagnosis in 93.4% of cases. Currently, the CT scan provides the most accurate findings [13].

The most common presentation was cough (48.84%) followed by chest pain discomfort (20.93%) in our study. However 16.28% cases were asymptomatic which was similar to the study done by Arinc *et al*. in Turkey [14]. The release of antigenic material and secondary immunological reactions that develop following cyst rupture may cause fever and acute hypersensitivity reactions ranging from urticaria and wheezing to life-threatening anaphylaxis may be the principal manifestations. Fortunately we didn't have a case of hypersensitivity reaction preoperatively [15].

Medical therapy with benzimidazoles is valuable in disseminated disease, including secondary lung or pleural hydatidosis, poor surgical risk patients and when there is intraoperative spillage of hydatid fluid.[16] A dose of 15 mg/kg of body weight daily in 2 divided doses (not to exceed total daily dose of 800 mg) has been prescribed to our patients for 28 days preoperatively and for at least 3 to 6 months postoperatively.

But surgery is still the treatment of the choice. The objective in the surgical treatment of pulmonary hydatidosis is to eradicate the parasite, to prevent the intra operative rupture of the cyst with its subsequent dissemination and to remove the residual cavity. Most authors agree that the attempt should be made to remove as little lung tissue as possible and that resection of pulmonary parenchyma is only indicated when the adjacent tissue is seriously damaged or infected, or when the atelectatic areas are presumably irrecoverable [17].

In most of our cases we treated the patients with open thoracotomy approach then cyst s were managed with cystotomy and capitonnage (72.09%). In the era of minimal invasive surgery we attempted VATS in the patients with single cyst, smaller than 10cm and located far from the hilum. Out of 8 cases we succeded in 62.5% cases and we had to convert to open thoracotmoy in 37.5%. The number of VATS is far less than open thoracotmy with compare to the study done by Balta *et al*. because we are still in the learning curve [18].

In our study the morbidity rate was 16.28% which was similar to the study done by Balta *et al*. where the morbidity was 20%.[18] Pneumothorax followed by bronchopleural fistula were the common complication in our study both of which were managed by chest tube. However we had to do the re surgery in one case for recurrence of the cyst. We had one mortality case (2.33%) which was similar to the study done by Ramos *et al*. [19] during the surgery one patient developed anaphylactic shock and succumbed to it.

Conclusion

H. cyst is commonly encounter in Nepal. Liver and lung are more commonly involved. Surgery is the treatment of choice. For the treatment of the pulmonary H. cyst VATS is safe having good result.

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