

Evacuation and Bronchial Opening Closure “the Result of 100 Surgeries for Lung Hydatid Cyst”

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Abstract

Hydatid cysts are an endemic zoonosis in Iran. Lung is second most common site of involvement (10-15%). There are different methods for hydatid cyst surgery: Video Assisted Thoracic Surgery, cystectomy, lobectomy, Evacuation and Bronchial Opening Closure (EBOC). This is a retrospective study of 120 patients operated between 1368 to 1380(1990 to 2002).

Our patients aged between 3 to 60 years; 62% males and 38% females. Patients present by symptoms as cough, sputum, bloody stained sputum, dyspnea, chest pain in 92% of cases; 4% of patients discovered incidentally. there were 10% of patients with bloody stained sputum; 5% had intact hydatid cysts.

All patients were operated via posterolateral thoracotomies. We did EBOC in 100 patients, lobectomy in 8 and cystectomies in 5 patients. Wedge resections performed in 7 patients. We did not use Video Assisted Thoracotomy Surgery.

Broncho pleural fistula occurred in 2% of patients, that forced us in one case to performing lobectomy, but another case was treated by chest tube insertion. Also there were 2 patients affected with empyema, treated with conservative treatments. Superficial wound infection occurred in 4 patients which was treated with drainage and all of them cured.

There were no additional complication in one-year follow up and residual cavity gradually faded, up to 6 months.

Evacuation and Bronchial Opening Closure is a safe, simple, and non-invasive procedure; it is applicable in a shorter time compared with other procedures; and then suggest using EBOC for lung hydatid cysts.

Keywords: Evacuation, Lobectomy, Intact cystectomy, Echinococosis, Video Assisted Thoracic Surgery (VATS).

Introduction

Hydatid cysts are caused by two species of cestodes family worms: Echinococcus granulosus, and E. Alveolaris. E. granulosus is endemic in Iran. It is commonly seen in rural areas because of unequipped slaughterhouses, unburied corps and carcass, and because infested dogs are in intimate contact with people especially with children playing with pets. Hydatid cysts are prevalent in children throughout the world¹, because of playing and handling pets. In 10 to 15% of all infected hydatid cysts, lungs are infested³. The Hydatid cysts pulmonary manifestations are as follow: rupture in bronchial tree; infection (abscesses and pneumonia); rupture in pleural space and subsequent hydropneumothorax. Rupture in the bronchial tree is the most common complication of hydatid cysts³. In 20% of patients hydatid cysts are bilateral, and in 24% there are multiple hydatid cysts. The most common site

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for hydatid cysts localization is inferior lobe of the lungs. The most relevant diagnostic tools are chest x ray and computerized tomography examinations. Essentially Hydatid cysts should be treated by surgery; however in some circumstances such as diffuse hydatosis and, or bilateral hydatid cysts or when patients do not accept surgery, or has proved cardiovascular problems and do not bearing surgeries procedures it may use medical treatment (albendazol or mebendazol)^{13,14}.

There are various modalities for surgical treatments of hydatid cysts, including: Video Assisted Thoracic Surgery, Intact Cystectomy, Lobectomy, and Evacuation and Bronchial Opening Closure (EBOC)^{3,5}, and infrequently pneumonectomy. The Video Assisted Thoracic Surgery is newest procedure for hydatid cysts surgical treatment. Preferably almost all patients are operated via posterolateral thoracotomy in 5th or 6th intercostals spaces.¹⁵ Should hydatid cysts are intact they may be operated by intact cystectomy; however, because of the risk of cyst rupture and its spread, intact cystectomy needs an experienced surgeon and skills³. If more than 50% of one lobe is involved or when after cyst evacuation and suturing bronchial openings, involved lobe did not expand, lobectomy should be done³.

In Evacuation and Bronchial Opening Closure, after cyst evacuation, bronchial openings on cyst cavity floor are sutured and then fibrotic tissues on cavity edges are cut and resected. Moreover all around the above mentioned edges are sutured with absorbable thread in a running manner. Although some authors use different modalities for residual cavity obliteration³ in this article we want to show that residual cavity needs no obliteration or capitonage; and remained cavity has no subsequent complication. It would be eliminate in a six months period.

Patients and methods

In a retrospective descriptive study we reviewed records of 120 patients operated for pulmonary hydatid cysts in a 13 years period between 1368 up to 1380(1990 to 2002) in teaching and private hospitals .All patients were operated by posterolateral thoracotomies via 5th and 6th intercostals spaces. Records were reviewed in terms of patients age, sex, clinical symptoms and signs, diagnostic procedures, operative procedures, and subsequent possible complications. There were no attempt to liberate all pulmonary adhesions; because of the risk of rupture and

spillage. We used 100mg,hydrocortisone injections before induction of anesthesia as prophylactic measure against anaphylactic reactions. During operative procedures silver nitrate 0.5% soaked gauzes walled off all around the cysts. We didn't use scolicial agents because of their serious complications in tracheobronchial tree. Also we didn't use albendazol or mebendazol as prophylactic measures.

Results

In this study we reviewed 120 records of patients operated for pulmonary hydatid cysts, aged between 3 to 60years,as showed in table 1.

Age Group	Number of Patients	Percent
3-15	26	21.55
16-30	50	41.66
31-45	30	25
46-65	14	11.55
Total	120	100

Most patients were in 20-40 years age group.

The most common symptom was dry cough, and 4% had no symptoms and discovered incidentally. Table 2 shows symptoms and signs of our patients.

Symptoms and Signs	Frequencies	Percent
Dry cough	60	50
Productive cough	15	12.5
Cough with hemoptysis	10	8.33
Chest pain	10	8.33
Fever	20	16.66
Incidentally discovered	5	4
Total	120	100

Thirty six patients (30%) were referred with hydatid cysts complications; their complications are shown in table 3.

Complications Type	Frequencies	Relative Frequencies (%)
Pneumonia	15	12.5
Lung abscess	8	6.66
Empyema and pleurisies	7	5.83
Hydropneumothorax	6	5
Total	36	100

The most common site of hydatid cysts were in right inferior lobes. Twenty-five percents of patients had bilateral cysts, and in 20% of cases there were multiple hydatid cysts in one side. All bilateral hydatid cysts were operated in two sessions and with one-month interval; without median sternotomy. In 10% of cases patients had both liver and lung hydatid cysts; therefore within lung surgery diaphragm opened and liver cysts removed, also.

Diagnostic tools for most patients were chest X ray; although for 20% of cases an additional computerized tomography is performed. Serologic tests were helpful for only 5% of patients to confirm chest X ray examinations.

Table 4 shows relative frequencies of radiological signs. Operative procedures are shown in table 5.

Reported Lesions	Fre- quencis	Relative Frequen- cies (%)
Pulmonary meniscus sign	24	20
Double dome arch sign	20	16.67
Water lily sign	10	8.33
Pneumonia	15	12.5
Oval cysts	51	42.5
Total	120	100

Operated Procedures	Number of Patients	Relative Frequen- cies
(E.B.O.C)*	100	83
Intact cystectomies	5	4
Lobectomies	8	6.67
Wedge resection	7	5.83
Total	120	100

* Evacuation and Bronchial Opening Closure

Post operative complications in EBOC groups were as follow: empyema in 2 cases, bronchopleural fistula in 2 cases (one case lead to lobectomy surgery). In lobectomized patients bronchopleural fistula occurred in one patient who treated with conservative treatment. There was no complication in intact cystectomized patients and in wedge resection cases. There was no mortality in operated patients.

During operation because there was no double lumen tracheal tube available in 4 patients cyanosis and secretion aspirations in posterolateral position occurred; 3 cases recovered with aspiration through endotracheal tube, but for remaining patient we discontinued procedure and referred the patients to ICU; who after intubation, ventilation and repeated bronchoscopies recovered and two months later underwent surgery.

In two cases cyst's elements aspirated in surrounding lobes but by bronchotomy it was disappeared, and procedure continued.

Discussion

Hydatid cysts essentially are treated by surgery; however, according to some reports, medical treatment can be used in up to 50% of patients.⁵ The most efficient drug is albendazol; however, should hydatid cysts complicated only treatment is surgery, because until all hydatid cysts elements didn't removed, there would be no cure for patient.

There are some reports about Video Assisted Thoracic Surgery (VATS) procedure⁵ but we have no experience in this new field. Also our experience in medical treatment is very limited.

There are various surgical modalities for hydatid cysts operations, including: Intact cystectomy⁶, evacuation and bronchial opening closure⁸ wedge resection⁶, and lobectomy³; in addition to VATS.

Intact cystectomy procedure needs most experienced surgeon, because of the risk of cyst rupture and spread in pleural cavity.³ We performed intact cystectomies for 5 patients if there were intact, but we don't suggest this procedure as a good procedure.

Evacuation and Bronchial Opening Closure (E.B.O.C) is a simple procedure; in this procedure after thoracotomy and localizing the cyst, with considerable cautions required for preventing of cyst's content spillage, we aspirated some cyst liquid and then evacuated all cyst content. Then we sutured remained opening in cavity floor thoroughly; and excised all fibrotic tissues on cyst's edge. Finally we sutured in running manner all around the residual cavity with absorbable thread to prevent air leakage and bleeding.

Lobectomy is performed in cases that more than 50% of pulmonary lobe is engaged by hydatid cysts; or there is a sever infection, sever bleeding, fibrosis,

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or bronchiectasis in involved lobe.³ Pneumonectomy is rarely required³ and we didn't used it in our patients.

Wedge resection is performed in cases that there is a small cyst or is located in peripheral position.⁶ Its application is limited; because most cysts are large and in central position. We used this procedure in 7 patients.

Our primary consideration is about remaining cavity. Historically in 1899 Posadas simply sutured remaining opening on cavity floor, but this resulted to air leakage, and some authors suggested fixation of the edges of pericystic zone to the thoracotomy incision in chest wall.⁹ Delbet recommended capitonnage¹⁰, and Crausoz in 1967 eliminated cyst cavity by string suture from cavity base of pericystic cavity upward to plane surface. With this procedure and partial pericystectomy remaining cavity managed (Demirlean, 12). In 1976 Saidi suggested there is no need to suture edges of pericystic zone; because lung parenchymal tissues and pleura, would fill remaining cavity anatomically; and cavity surface will be covered by pleura.⁸

We first performed cyst evacuation, sutured bronchial openings, and resect all fibrotic tissues, and exposed intact pulmonary structure; then we sutured remaining pericystic edges. There was remaining a cavity, but it would be eliminated in a six month period. During this period chest X ray examination shows an air-liquid shadow but it is not important, and there has no problem.

Overall; an important matter in hydatid cysts surgery is operative modality, and more important is approach to remained cavity and need to find and closure of all patent bronchial openings. One must then fill the remaining cavity with 0.5% Silver nitrate, and hyperinflated it by assisting anesthesiologist. If there seen some another bronchial openings they should treated as mentioned above, as many as needed; because they may be opened with sever coughing and cause bronchopleural fistula.

We are believed and suggested that Evacuation and Bronchial Opening Closure (EBOC) is the most common procedure for hydatid cysts treatment; and precystic edges fibrotic tissues resection accompanied with suturing by absorbable thread will prevent air leakage and bleeding.

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