Case Report

Minimal invasive approach for Giant Pulmonary Hydatid cyst

Deepak Raj Singh, Abishek Thapa, Mahipendra Tiwari

Abstract

Hydatid cyst is a major health problem in agricultural countries caused by larval stage of Echinococcus granulosus. Hydatid cysts of 10 cm or greater in diameter are called "giant" cysts and traditionally have been considered to be more difficult to treat surgically.

A 30 year male presented with complaints of cough and chest pain for three days and a CECT chest suggesting lung abscess. When thoroughly evaluated with bedside ultrasound, it was revealed to be a case of giant Hydatid cyst. The patient underwent cystostomy with closure of bronchial opening with capitonnage with minimal invasive approach (VATS assisted minithoracotomy).

Even Giant Hydatid cyst can be managed with VATS, avoiding formal thoracotomy. Preoperative sonoscopy can localize the exact site for port placement and guide the surgeons on the operation table.

Keywords: Hydatid cyst; Minimal invasive; Pulmonary.

Author affiliations:

Department of surgery,
KIST Medical College Teaching Hospital,
Lalitpur, Nepal.

Correspondence:

Dr. Deepak Raj Singh
Department of surgery, KIST Medical College Teaching Hospital, Lalitpur, Nepal.

Email: drsinghnp@gmail.com

ORCID: https://orcid.org/0000-0001-8174-9619

How to cite this article:

Singh DR, Thapa A, Tiwari M. Minimal invasive approach for giant pulmonary hydatid cyst. J Soc Surg Nep. 2021;24(2):67-70.

DOI:

https://doi.org/10.3126/jssn.v24i2.42838

Introduction

Hydatid cyst is a major Health problem in agricultural countries because of lack of satisfactory preventive medicine, environmental health, and veterinarian services. It is caused by the larval stage of Echinococcus granulosus.[1] Carnivores such as dogs and wolves are the definitive hosts for E. granulosus and infection occurs by ingestion of the viscera of intermediate hosts (eg., goats, pigs, cattle) containing hydatid cysts. The infected carnivores pass eggs by defecation.[2] Humans get infected by ingesting eggs from the contaminated ground. Larvae that are released from the eggs penetrate the intestinal lining and are transported by blood or lymph to different organs. Lung is the second most common localization organ after liver.[3]

Hydatid cysts of 10 cm or greater in diameter are called "giant" cysts and traditionally have been considered to be more difficult to treat surgically and often requiring pulmonary resection.[4,5]

Case report

A 30 year male from Kailali presented in the outpatient department with a three day history of productive cough, which was not blood-mixed but was increasing in frequency. There was also a history of right sided chest pain for three days which increased during inspiration and cough, was sharp, and non-radiating. There was no history of fever, shortness of breath or loss of taste. He was a nonsmoker and did not consume alcohol.

His general examination findings were normal and vitals were stable, however chest examination revealed bilateral diffuse crepitation and wheeze. The abdominal examination was normal.

Chest x-ray showed well defined, large, homogenous opacity without calcifications or pleural effusion (**Figure 1**). CECT scan showed a large, loculated fluid collection in the right

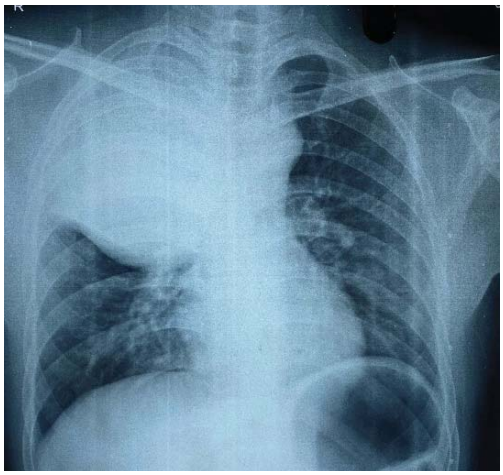

Figure 1. Chest X-ray

Figure 2. CECT Chest

upper lobe with irregular, thickened and enhancing wall. There was compression of the adjacent lung parenchyma with minimal partial collapse of lung, suggesting lung abscess (**Figure 2**).

Bedside sonoscopy was done with a plan of pig tail insertion for the abscess, but when we aspirated, to our surprise, it was not pus but clear fluid (**Figure 3**). This raised the suspicion of hydatid cyst and fluid analysis and other lab investigations were sent.

Analysis of aspirated fluid showed 40% lymphocytes, ADA 0.4 IU/L, total protein 0.2 gm/dl, and albumin 10.6 g/dl. Hydatid sand was not seen, however ELISA for Echinococcus was positive. The ESR was 20mm and C-reactive protein was positive. The total leucocyte count was 16,800/cumm and the absolute eosinophil count was 6,601/cumm. Other investigations were within normal limit.

So with the chest x-ray and CT scan findings, along with serology and hematology parameters a diagnosis of hydatid cyst was made and we gave Tab Albendazole for one week before we went for operation.

All pre-operative assessment and routine investigations were within normal limit. He was young and totally fit for surgery. We planned for cystectomy with closure of bronchial opening with capitonnage and we decided to try the minimal invasive approach (VATS assisted mini-thoracotomy) instead of the conventional open surgery. It was challenging because the cyst was giant and there is very little literature available till date for thoracoscopic approach for large hydatid cysts.

Before incision, sonoscopy was done on the operating table by the operating surgeon. This provides a clear advantage as the operating surgeon can evaluate the location of the diaphragm and place the camera port accordingly. The working port was also placed under sonoscopic guidance so that we had ample space for handling the cyst thoracoscopically.

There was a large cyst located at the upper lobe of right lung with dense adhesions between cyst wall and the chest wall, which was separated with VATS. We could exactly localize the cyst easily through VATS. Then we made an incision over the exact location of the cyst .We dissected the cyst from surrounding structures and we could feel

Figure 3. Bedside sonoscopic evaluation by surgeon

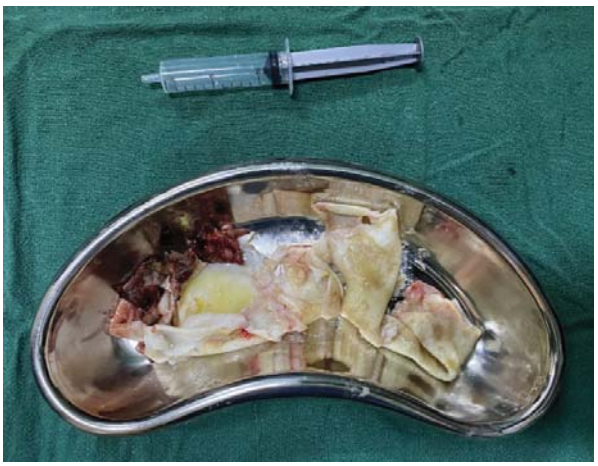

Figure 4. Hydatid cyst specimen

the cyst with finger from the working port. Povidone iodine soaked gauze was kept around the cyst to take care of spillage. Aspiration of cyst contents was done and hypertonic saline was injected. Excision of the cyst wall was done and normal saline was kept in the cavity. We asked the anaesthetist to inflate the lung to check for air leakage, which was taken care with polyglactin suture and capitonnage of pericystic wall with suture. Hemostasis was maintained. Surrounding lung parenchyma was normal. Cystobronchial communication was identified and closed with suture and chest tube kept (**Figure 5**). There were no complications during the operation and the patient did not require any blood transfusion.

Patient was extubated just after surgery. He was shifted to general ward on the 2nd postoperative day. There was no significant post-operative complication. Early spirometry and mobilization was done and he was fit to be discharged on the 7th POD. The histopathological examination of the cyst confirmed hydatid cyst. He is doing well in follow up.

Figure 5. Post-opeative scar and drain

Discussion

The fully developed hydatid cysts are composed of three layers - the pericyst (composed of inflamed fibrous tissue derived from the host), the ectocyst (an acellular laminated membrane), and the innermost layer or the endocyst which is the germinative layer of the parasite and gives rise to brood capsules (secondary cysts), that bud internally. Protoscolices are produced within the brood capsules. The fluid, which is antigenic, may contain debris, hooklets and scolices. These are referred to as hydatid sand. Daughter cysts may develop directly from the endocyst, resulting in multicystic structures. These layers are of surgical importance.[6]

Principle of management of hydatid cysts:

- Size of cyst: Small Medium Giant
- Complications: Pleural effusion, Pneumothorax, Empyema etc.
- Activity of cyst: WHO classification[7]

Medical therapy

Medical therapy is indicated for smaller cysts (<5 cm), multiple cysts, difficult cyst or recurrent cysts or if there is contraindications for surgery: poor surgical risk, refusal for surgery and multi-organ disease. However, the treatment of pulmonary hydatid cyst is primarily surgical.[8,9]

Invasive interventions for pulmonary hydatid cysts:

1. Aspiration (analogous to PAIR)
2. Enucleation
3. Cystostomy
   -with closure of bronchial opening
   -with closure of bronchial opening + capitonnage
4. Pericystectomy
5. Resection
   -Segmentectomy
   -Lobectomy
   -Pneumectomy[10,11]

The standard treatment has long been accepted as surgical treatment including cystectomy/cystotomy with or without capitonnage performed for every cyst. The most important principle for the management of pulmonary hydatid surgery is to preserve as much lung parenchyma as possible and anatomical resection is needed in very small fraction of patients. With improvements in minimally invasive surgery in thoracic surgery, video-assisted thoracoscopic surgical treatment has been reported to be utilized in the management of pulmonary hydatid cyst. The main advantages of minimally invasive techniques are their milder perioperative trauma and less pain as it avoids forceful retraction of the intercostal areas. That resulted in lower postsurgical pain, shorter hospital stay, fewer complications and faster recovery after the surgery, and better quality of life. Surgeons doing sonoscopy preoperatively can get advantage of handling even large hydatid cyst via VATS. The optimal procedures performed should be determined on an individualized basis and requires a careful preoperative evaluation.[8]

Conclusion

Even giant hydatid cysts can be managed with minimal invasive approach avoiding formal thoracotomy. Peroperative sonoscopy can localize the exact site for port placement and guide the surgeons on the operation table. Therefore it is helpful for a surgeon to learn sconoscopy.

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