



(CASE REPORT)



WHEN CHEST TRAUMA REVEALS A PULMONARY HYDATID CYST: ABOUT TWO CASES

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ABSTRACT

Pulmonary hydatid disease remains endemic in Morocco. Although often asymptomatic, cyst rupture may cause severe thoracic complications, and blunt chest trauma is an uncommon trigger of rupture that can lead to acute respiratory manifestations. We report two cases of pulmonary hydatid cysts revealed by blunt chest trauma and complicated by pleural or bronchial rupture. A 34-year-old man involved in a road traffic accident developed cough and mild hemoptysis. Chest imaging showed a large right hydropneumothorax with complete lung collapse and a right lower-lobe cavity containing floating membranes. After emergency drainage, right lower lobectomy was performed because the cyst occupied the entire lobe. A 17-year-old adolescent presented after blunt anterior chest trauma with acute chest pain and dyspnea. Imaging revealed a right pneumothorax with an air-fluid level and an upper-lobe cavitory lesion. Chest drainage yielded serohematic fluid containing hydatid membranes. Pericystectomy with closure of bronchial fistulas and cavity padding was subsequently performed. Both patients had an uneventful postoperative course and received albendazole therapy. Blunt chest trauma can reveal pulmonary hydatid disease through cyst rupture. In endemic areas, hydatid cyst rupture should be considered when traumatic pneumothorax or hydropneumothorax is associated with characteristic cavitory lesions. Early diagnosis and appropriate surgical management are essential.

Keywords: Pulmonary Hydatid Cyst; Blunt Chest Trauma; Cyst Rupture; Hydropneumothorax; Surgical management

1 INTRODUCTION

Echinococcosis is a cosmopolitan parasitosis caused by the larval form of *echinococcus* granulosus; it is still common in countries around the Mediterranean, particularly in Morocco. Thoracic hydatid disease ranks as the second most common localization of hydatidosis in adults, following hepatic localization. It is usually contracted at a young age and affects both sexes in varying proportions depending on the published series. It can be primitive resulting from the evolution of an egg ingested by the host or as a secondary condition, occurring due to the dissemination of fertile contents from a ruptured hydatid cyst (KH) within the body. All thoracic compartments can be affected but the lung is the most frequently affected site (1). Diagnosis relies on a combination of patient history, clinical examination, imaging studies, and immunological tests. Surgical intervention remains the sole effective treatment option at present. In this report, we present two particular clinical cases of pulmonary hydatid cysts that were discovered following blunt chest trauma.

2 PATIENTS AND OBSERVATIONS

2.1 Clinical case

We present the case of a 34-year-old patient who was involved in a road accident, specifically a motorcyclist struck by a car. The patient was promptly taken to the emergency department at Ibn Sina University Hospital in Rabat for immediate care. Upon questioning, the patient reported a history of chronic smoking and frequent contact with dogs. The patient presented with a cough and mild hemoptysis that started after the accident. Clinical examination revealed tachycardia (heart rate of 108 beats per minute), tachypnea (respiratory rate of 28 cycles per minute), and signs of right-sided pleural effusion. Initial chest X-ray showed a large hydropneumothorax with mediastinal shift, as well as a collapsed lung with a rounded paracardiac lesion containing air and fluid (image 1). Subsequent thoraco-abdominal CT scan confirmed the presence of hydropneumothorax and revealed a cavity in the right lower lobe containing floating membranes, raising suspicion of a ruptured pulmonary hydatid cyst with intra-bronchial involvement (image2).



Figure 1: Chest x-ray showing a right hydropneumothorax with total lung collapse associated with a right paracardiac cavitory image

An anterior drainage procedure was performed, resulting in immediate bubbling of 300 cc of hematic fluid and re-expansion of the lung against the chest wall as evidenced by the follow-up radiograph.

Following the management of the emergency condition (hydropneumothorax), surgical intervention for the pulmonary hydatid cyst was scheduled and executed on the third day of admission.

Preoperative preparation commenced promptly upon transfer from the emergency department, involving antibiotic therapy and physiotherapy.

A right lower lobectomy was conducted via a right posterolateral thoracotomy through the 5th intercostal space. The hydatid cyst occupied the entire right lower lobe, necessitating its excision as conservative treatment was deemed unfeasible.

The postoperative recovery was uneventful, with drainage tubes removed on the second postoperative day, and the patient discharged on the third postoperative day.

Pathological examination of the resected lobe confirmed the presence of a pulmonary hydatid cyst.

2.2 Clinical case 2

The second case is about A 17-year-old patient with no significant medical history who sustained a blow to the anterior thoracic region, resulting in sharp chest pain and dyspnea at rest. Upon arrival at the emergency department, the patient exhibited signs of respiratory distress with a respiratory rate of 28 cycles per minute and a heart rate of 135 beats per minute. Further examination revealed a right-sided pneumothorax with air-fluid levels on chest X-ray, along with a cavitory lesion in the upper lobe. Subsequent chest CT scan confirmed these findings, indicating a ruptured pulmonary hydatid cyst with pleural involvement. The patient underwent immediate placement of a right axillary chest drainage, which yielded sero-hematic fluid containing hydatid membranes, confirming the suspected diagnosis. Preoperative

preparation included antibiotic therapy, anthelmintic treatment, and physiotherapy. Surgical intervention involved pericystectomy with closure of fistulas and padding. The postoperative course was uneventful.



Figure 2: Chest x-ray showing a right tension pneumothorax with total lung collapse associated with a cavitory image of the right upper lobe and a hydro-aeric level

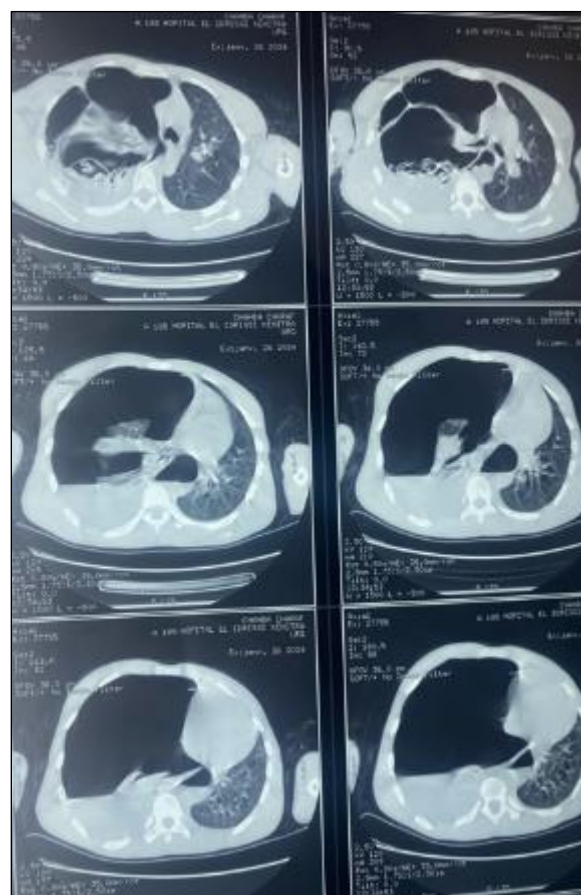


Figure 3: Chest CT scan showing a right tension pneumothorax with total lung collapse associated with a cavitory image of the right upper lobe and a hydro-aeric level containing floating membranes

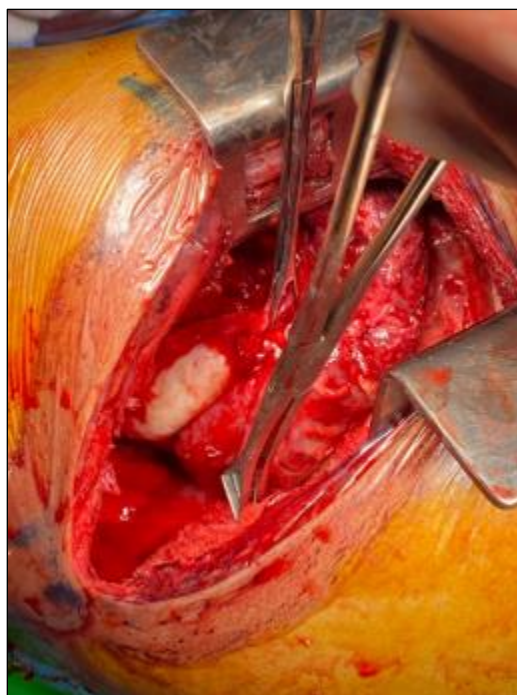


Figure 4: Perioperative image showing the hydatid cyst at the posterior segment of the right upper lobe which is ruptured at its posterior part

3 DISCUSSION

The hydatid cyst is a cosmopolitan parasitosis which is still endemic in Morocco; it is caused by the larval form of *echinococcus granulosus*. In humans the liver is the most common site of cyst development (60%), followed by the lungs (20%), and less commonly, the kidney, spleen, brain, and soft tissues. The clinical manifestation of pulmonary hydatidosis depends on the location and size of the cyst. The small cyst may remain asymptomatic for a long time; discovered accidentally on chest x-rays; as may be revealed by the classic symptomatic triad including a persistent cough; hemoptysis and chest pain (2;3;4).

Complications occur in approximately 70% of cases during the progression of pulmonary hydatid cysts, including rupture, infection, or compression (5;6). Rupture is the most frequent complication, which can happen spontaneously without a discernible cause, often facilitated by the size and location of the cyst. Additionally, chest trauma or vigorous coughing can trigger rupture. Rupture typically occurs in the bronchi in 70% to 90% of cases, although it can also occur in the pleural cavity and rarely in the pericardium.

Bronchial rupture is characterized by *hydatid vomica*; which sometimes is revealed by means of a sub- feverish state, repetition of hemoptysis, or recrudescence of coughing. Typical or disguised by hemoptysis, purulent expectoration, or vomitus, total or partial, and spread throughout several days, vomica is an accident that exposes the patient to severe complications: acute respiratory failure, massive hemoptysis, anaphylactic shock, cardiovascular collapse, in addition to the possibility, although exceptional, of secondary bronchogenic hydatid spread.

In imaging, pulmonary KH vomited into the bronchi results in a pneumocyst with a cavity having hydro-aeric content and in aspiration pneumonia which can be segmental, lobar, of an entire lung and sometimes even of the contralateral lung (3). Depending on whether the vomit was complete or partial, different radiological aspects can be carried out (7-15), for example: the appearance of the “double airy crescent” encountered in the early aftermath of vomit and the appearance of the “horizontal hydro-aerial level” reflecting complete evacuation of membranes or their immersion in the hydatid liquid.

Although not frequent, rupture of the pleura is far from exceptional and can be seen in 1.5 to 6% of the cases. The peripheral and basal location of the cysts would be a contributing factor to this type of rupture (16;17).

Acute rupture complicates young, large, rapidly growing, and tension pulmonary KH. It manifests clinically as chest pain, respiratory distress and sometimes anaphylactic shock. In imaging of pleural rupture, a hydropneumothorax appearance may occur, as well as a germinative membrane floating in the pleural space. Tension pneumothorax may

develop as a result of excessive air output. After closed underwater drainage, the continuation of air leakage, the lung not expanding, and the radiological appearance of a cavitory lesion of the parenchyma support the diagnosis (18).

In the absence of treatment, pleural KH can invade the lungs by contiguity, rupture in the bronchi or become embedded in the mediastinum, the diaphragm and the wall.

The chest radiograph of our patients who were admitted to the emergency department for a blunt chest trauma; showed a right hydropneumothorax with cavitory lesions. Thoracic CT confirmed the diagnosis of complicated pulmonary hydatid cyst.

The treatment of pulmonary hydatidosis is primarily surgical and must concern all cysts, whether they are symptomatic or not. Its objective is to ensure eradication of the parasite while preserving the functional parenchyma as much as possible. It is provided by the techniques of enucleation, cystectomy combining extraction of the hydatid membrane and sterilization and aspiration of the cystic contents or precystectomy removing the cyst and peri cyst en bloc.

The attitude towards the residual cavity is conditioned by the state of the peri cyst. It consists, depending on the case, of suturing the broncho vascular breaches when the peri cyst is flexible, of a peri cystectomy with padding of the cavity, of an atypical pulmonary resection removing the non-ventilated peripheral areas or of a controlled resection removing a segment, a lobe or entire lung (4;5;19).

Surgical management of ruptured pleural cysts involves reducing the number of resections required, while prioritizing decortications and pleurectomies (17).

Chemotherapy; In cases that do not accept surgery, in cases where surgery is risky, in cases with recurrence, in multi-organ involvement (lung, liver, spleen, etc.) and in cases where the disease has spread to both lungs. It is applied in cases where it is necessary. It is also recommended as a prophylactic method to prevent postoperative recurrences (20;21)

In our cases; Tube thoracostomy was first performed due to the presence of hydropneumothorax; in the first case a radical resection was undertaken due to the large volume of the cyst occupying the entire right lower lobe. Conversely in the second case and with confirmed pleural rupture; conservative treatment was maintained. Following surgery both patients underwent 6 months of chemotherapy with albendazole.

4 CONCLUSION

Post-traumatic rupture of the pulmonary KH remains exceptional; the positive diagnosis is based on clinical and radiological signs as well as hydatid serology.

Treatment is essentially surgical and is primarily based on the management of lesions that could be life-threatening.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

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Disclosure of conflict of interest

The authors declare no conflicts of interest regarding this manuscript.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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