

25 YEARS EXPERIENCE IN PULMONARY HYDATID CYSTS TREATMENT

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Abstract

Pulmonary hydatid cyst is a common pathology in children coming from the rural areas. In this paper we evaluate the results of the surgical treatment over the past 25 years. It is a retrospective study about the management children with pulmonary hydatid cysts treated between 1988 and 2013 in our institution. Of 432 children with pulmonary hydatid cysts, 85% had unilaterally lesions while in 15% of cases both lungs were affected; the right lung was involved in 54% of the cases; in 74% of the cases there was a single cyst and in 26% there were multiple hydatid cysts. In 59 cases there were associated extrapulmonary hydatid cysts. The treatment consisted of cystotomy with wedge resection, membrane removal, drainage of the remaining cavity and of the pleural space in 87,5%, ideal cystectomy in 11,5%. Toracophrenolaparotomy was performed for associated liver and right pulmonary cysts in 1% of the cases. There were postoperative complications like: wound infection, prolonged bleeding and one death occurred in a 2 years old boy with multiple bilateral cysts. The drainage of the remaining cavity was prolonged in 8 cases. There was no recurrence of the hydatid disease. Pulmonary hidatid cyst is the most frequent surgical pulmonary disease in children in our country. All hidatid cysts were incidentally discovered. Our approach was lateral thoracotomy without rib resection. In bilateral lung localizations, the second intervention was performed 3 to 6 months after the first. The treatment of the pulmonary cysts had priority on the extrapulmonary localisations.

Key words: pulmonary, hydatid cyst, child, surgery, cystostomy, cystectomy

Introduction

Human echinococcosis is a zoonotic infection caused by the tapeworm of the genus *Echinococcus*. There are 4 known species of *Echinococcus* of which 3 are of medical importance in humans. *Echinococcus granulosus*, causing cystic echinococcosis is the most frequent, *Echinococcus multilocularis*, causing alveolar echinococcosis is rare but most virulent and *Echinococcus vogeli*, which is the most rare.

Along with the Mediterranean countries, south Africa and Middle east, (1) Romania is an endemic country

for this parasite, with an incidence of 1–220 cases per 100000 inhabitants. Epidemiologic studies of cystic echinococcosis in Romania emphasize the need for improved preventive measures (2).

In the paediatric population, the hydatid cyst is more frequent in children coming from rural areas, due to a closer contact with dogs and/or sheep, goats or swine which are the definitive and intermediate hosts respectively. Infestation can occur when exposed to water and food contaminated with faeces of a infected definitive host (1). In the paediatric age group pulmonary hydatid cysts need to be differentiated from other thoracic masses like congenital malformations, tumors, tuberculosis. There are studies that state that in the paediatric population pulmonary hydatid cysts are more frequent than the hepatic ones are (3).

Hydatid cysts may remain asymptomatic for a long time; the parasitic load, cyst site and size determine the degree of symptoms. Theoretically, echinococcosis can involve any organ. The liver is the most common organ involved, followed by the lungs. These 2 organs account for 90% of cases of echinococcosis.(4) As for the pulmonary cysts the symptoms can vary from total asymptomatic to irritative cough, haemoptysis, pain, coughing up of hydatid fluid, dyspnoea, spontaneous pneumothorax, allergic reaction like urticaria and erythema or purulent sputum when an infected cyst opens in a bronchus.

The morbidity of pulmonary cysts comes from compression of mediastinal structures; rupture into the pleural cavity or heart or into a great vessel and asphyxia, haemorrhage or anaphylaxis when intrabronchial rupture occurs.

Surgery is the primary treatment method of pulmonary unilocular hydatid cysts. Newer methods like puncture, aspiration, injection and reaspiration (PAIR) are still under evaluation (5;6). Chemotherapy is used as an adjuvant to surgery, to prevent relapse of the disease, in case of inoperable cysts, in multiple locations or in peritoneal cysts. There are two benzimidazoles available but in our country, we are more familiar with Albendazole, given orally at a dose of 10 – 15 mg/kg/day, for a period of 3 – 6 months.

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Purpose

The aim of this paper is to present the results of various surgical treatment methods of pulmonary hydatid cysts in children that were used in the past 25 years in our clinic

Materials and Methods

For that matter we reviewed, in a retrospective study, the epidemiology, cyst's characteristics, diagnosis, treatment and complications in children with pulmonary

hydatid cysts treated in the Department of Pediatric Surgery of 'Maria Sklodowska Curie' Emergency Children's Hospital, Bucharest, between 1988 and 2013.

We also noticed that in the group of children with surgical thoracic pathology treated in our clinic in the mentioned period, the majority consisted of hydatid cysts, as you can see in figure 1.

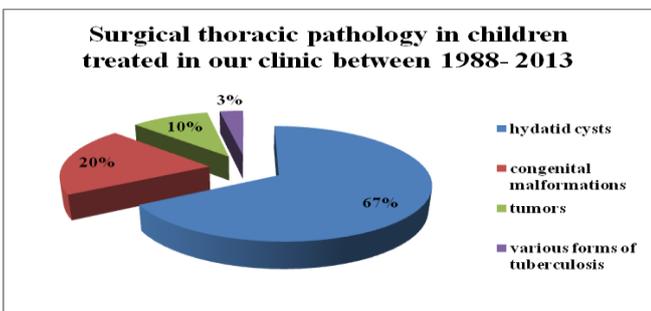


Fig. 2.Surgical thoracic pathology in children treated in our clinic between 1988- 2013

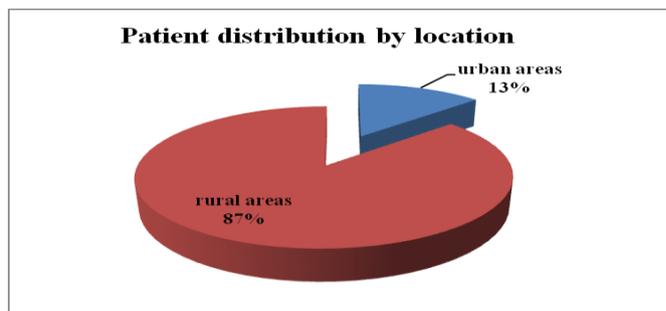


Fig. 1. Patient distribution by location

Results

Our study comprises 432 children with pulmonary hydatid cysts with ages between 2 and 18 years. The majority of them came from a rural environment, 87% and only 13 % lived in a city area, but parents admitted to have around the house seep and/ or dogs (Fig. 2). This is consisted with literature data.

The hydatid cysts were incidentally discovered on pulmonary X-ray examination for pulmonary tract infection, cronic cough and thoracic deformation. We performed complementary investigations like blood count, abdominal ultrasound and when more details were needed , CT scan of the abdomen, thorax and cranium, IV urogram, ultrasound examination of soft tissues.

There was no significant sex difference, as both sexes were equally represented in our group.

In regard to cyst localization, we found only 15 % of patients with bilateral cysts, while the rest of them had one affected lung only. As it is mentioned in other studies, there are almost equal numbers of patients with right and left lung cysts: 54% on the right, 46 % on the left. A single cyst was identified in 74% of the patiens, while 26% had multiple.

There were 59 patients in witch extra pulmonary cysts were associated. Most of them were hepatic, 22 (37.3%) in the left hepatic lobe and 20 (33.9%) in the right hepatic lobe, but there were also peritoneal cysts (5- 8.5%), splenic cysts (4 – 6.7%), renal (4 – 6.77%), of the broad ligament 2 – 3.38%, one (1.7%) retroperitoneal and one of the quadriceps muscle.

The treatment consisted mainly of cystotomy, inactivation of the cyst with scolicial agents - 20% hypertonic saline solutions or 95% ethanol, with wedge resection, membrane removal, lavage of the remaining cavity with physiologic serum and betadine, and after

identifying and suturing any visible bronchial fistulas, drainage of the remaining cavity and of the pleural space. This procedure was performed on the majority of patients, 87,5% respectively. We were able to perform ideal cystectomy in 11,5% of them. In both situations, the thorax was opened through a lateral thoracotomy without rib resection.

For the bilateral cysts we performed two different operations at 3-6 months interval, while in patients with pulmonary and extrapulmonary cysts we first operated on the lung and after complete recovery the extrapulmonary cyst was excized.

In one patient with right lung hidatid cyst located in the inferior lobe associated with hepatic cyst of the rihgt lobe, we performed thoracophrenolaparotomy and treated both cyst in the same session.

There was no need for sternotomy or lung resection in any of our patients.

There were several complications. Wound infection appeared in 14 patients witch required daily nursing but healed uneventfully in 10- 14 days, postponing with several days the discharge. Prolonged drainage was registered in 8 cases. While we usually keep the tubes in place for 2-4 weeks, these particular patients had prolonged drainage through the remaining cavity tube and could not be removed until week 8 post operatory. There was one case of post operatory bleeding that we had to explore in the operating room. On thoracoscopy there was no evident source of bleeding and the bleeding stoped spontaneously on day 3 post operatory after lavage and drainage that continued for another 2 days.

We registered one death, in a 2 year old boy who had multiple bilateral pulmonary hydatid cysts, 7 on the right and 4 on the left. No autopsy was performed.

On long term follow-up, there was no relapse of the disease and on 4 to 6 months pulmonary reexpansion was complete in all of our patients, with no residual cavity visible on chest X-ray.

Discussions and/or Conclusions

Pulmonary hydatid cyst is the most frequent surgical pathology in children and most of the time the diagnosis in incidental, on thoracic X-ray examination, demanded for respiratory tract infection, cough, etc., as clinical signs are non specific. Of some value in the diagnosis process of the cysts and of its complications, are the total blood count, IgM antibodies abdominal ultrasound, CT scan.

The treatment is primarily surgical and consists of evacuation of the cyst and of its membrane after inactivation with scoliced solutions. The approach by lateral thoracotomy, without rib resection, is suitable in the majority of cases, with rapid healing.

For patients with pulmonary bilateral cysts we choose a staged procedure, on 3 to 6 months interval. If there was a pulmonary cyst associated with an extrapulmonary one, the first treated was the pulmonary cyst. None of the patients required lobectomy or pneumectomy and the remaining cavity resorbed in a period of 4 to 6 months.

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