

Anaphylaxis during puncture of a hepatic hydatid cyst

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ABSTRACT

Although hydatid cyst infects many organs, it most commonly involves liver, lungs, and central nervous system. The goal of hydatid cyst treatment is to completely eliminate the parasite and to prevent recurrences with minimal mortality and morbidity. The procedure of puncture, aspiration, injection of a scolicedal, and reaspiration (PAIR) of a cyst has been introduced as an alternative to surgical method since it is less invasive and less morbid and is associated with a shorter hospital stay and a lower cost. Herein, we report an 11-year-old girl who developed anaphylaxis during the puncture of a hepatic hydatid cyst. The patient who developed anaphylaxis during the PAIR procedure was administered intravenous adrenaline, methyl prednisolone, and antihistaminic medication. She was intubated and provided assisted ventilation using a mechanic ventilator. The child was extubated 4 h after her admission to the pediatric intensive care unit. During follow-up, the contents of her hepatic hydatid cysts were aspirated through a catheter, followed by their irrigation with 20% sodium chloride and re-aspiration. Then, 97% ethyl alcohol was injected into the cyst cavity to make it collapse. The goal of this report was to draw attention to the rare occurrence of anaphylaxis during the PAIR procedure and to stress that clinicians should be vigilant for this complication.

Keywords: Anaphylaxis; hydatid cysts; PAIR procedure.

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Hydatid cyst disease is a parasitic disease that threatens human and animal health. The parasite causes the development of cysts that gradually grow in size in all organs and tissues, primarily liver and lungs. Hepatic hydatid cyst disease is usually asymptomatic. The symptoms emerge when a cyst excessively grows in size to occupy a large space or when it is complicated. In addition, allergic reactions such as urticaria, angioneurotic edema, asthma, or anaphylaxis may rarely develop when the antigenic cyst content that is in protein structure is released into systemic circulation as a result of cyst rupture, either spontaneously or due to trauma. The incidence of hydatid cyst rupture is 3–17% [1, 2]. We report here an 11-year-old girl who suffered an episode of anaphylaxis during the puncture of a hepatic hydatid cyst. Informed consent was obtained from the patient's family.

CASE REPORT

A female child had been diagnosed with hepatic hydatid cyst 6 months ago and treated with albendazole. She was referred to our hospital for an evaluation of abdominal pain. The patient was living in Diyarbakir and owned a dog. She had no history of food or drug allergy. She had a IHA: 1/640 for *Echinococcus granulosus*. An abdominal ultrasonography revealed 2 fertile cysts with diameters of 5.5 cm and 7 cm at the posterior segment of the right lobe of the liver and at the medial segment of the left lobe of liver, respectively, which had smooth borders and thickened walls and contained anechoic germinative membranes. Albendazole treatment that had been ceased 1 month earlier was reinstated. PAIR procedure was scheduled since it had a lesser rate of complications, a less invasive nature,

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and a shorter hospital stay compared to surgical intervention. On the 7th day of treatment, the procedure was started under anesthesia with an experienced team consisting of an interventional radiologist, a pediatric surgeon, and an anesthesiologist. The hydatid cyst in the posterior segment of the left lobe of the liver, which had a diameter of 5.5 cm and contained septae, was entered with an 18G Chiba needle under ultrasonography guidance. Hydatid cyst fluid was aspirated. A guidewire, followed a dilator, and finally, an 8F external drainage catheter were placed through the Chiba needle. The catheter was sutured to the skin. A total of 120 cc hydatid cyst fluid were drained through the catheter. A total of 80 cc 20% sodium chloride were injected into the cyst cavity, and it was aspirated after a 20-min waiting period. The hydatid cyst with a diameter of 7 cm that was in the medial segment of the left lobe of liver was entered with an 8F drainage catheter. A total of 200 cc hydatid cyst were drained. However, the patient developed bronchospasm and anaphylactic reaction during the second procedure. She was administered intravenous adrenaline, methylprednisolone, and antihistaminic medication. The patient was intubated, admitted to the pediatric intensive care unit, and connected to a mechanical ventilator to provide assisted ventilation in the SIMV-PS mode. Intravenous hydration administered, and she was extubated 4 h after the intubation.

The albendazole treatment was continued. Meanwhile, her eosinophil count increased from 0.5% to 10.6% and her absolute eosinophil count increased from $82 \mu\text{L}^{-1}$ to $1400 \mu\text{L}^{-1}$. Other results were as the following: White blood cell count of 28.200 mm^3 , hemoglobin: 14.2 g dL^{-1} , thrombocyte count of 413.000 mm^3 , C-reactive protein $<0.1 \text{ mg dL}^{-1}$, and procalcitonin $<0.1 \text{ ng mL}^{-1}$. A blood gas analysis and serum biochemistry were normal. A total of 400 cc cyst fluid were drained from both catheters.

An ultrasonographic examination performed on the 2nd day following the procedure showed that the cysts were all collapsed. Fifty cc 20% sodium chloride was administered from each drainage catheter, and the content was reaspirated. The catheters were left on free drainage. On the 3rd day after the procedure, fluoroscopy was performed after injecting contrast material through the catheter. It was noted that the contrast material filled the cyst cavity and no contrast passaged occurred into bile tracts (Fig. 1).

Then, 40 cc 97% ethyl alcohol was injected through both drainage catheters. The catheters were left closed for 5 min, during which time the patient was placed in right-left lateral decubitus, supine, and prone positions. All injected fluid was then aspirated, and the catheters were left on free drainage.

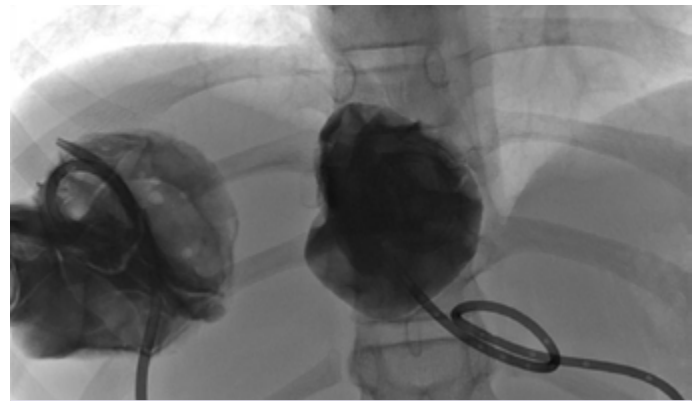


FIGURE 1. The cyst cavity bile tracts.

Upon the cessation of drainage on the 4th day, the catheters were removed, and the patient was transferred to the pediatric ward. She was recommended to continue albendazole treatment and to return for a control visit 1 month later.

DISCUSSION

Although hydatid cyst causes disease of many organs, it most commonly involves liver, lungs, and central nervous system. The goal of treatment is the complete elimination of the parasite and prevention of recurrences with minimal mortality and morbidity. The selection of an ideal treatment approach is dependent on cyst size and number, localization, cyst properties such as the cystobiliary connection, surgical expertise, and the availability of an interventional radiologist. Albendazole is a wide-spectrum antihelminthic that belongs to the benzimidazole group. In a multicenter study, its efficacy was shown to be low. However, it provides important assistance for preventing dissemination during surgical and percutaneous therapy [3]. Literature data suggest that albendazole should be commenced 5 days to 3 months before the intervention of hepatic hydatid cyst lesions [4]. Our patient had also received albendazole treatment for 5 months prior. We reinstated the albendazole treatment 7 days before the procedure and continued 1 month thereafter.

In recent years, the PAIR procedure encompassing the puncture, aspiration, injection of a scolicidal, and reaspiration of a cyst has been introduced as an alternative method to surgery as a result of its favorable properties of being less invasive, causing less morbidity, reduced duration of hospital stay, and reduced total cost [5, 6]. PAIR is a procedure whereby the cyst cavity is entered percutaneously, aspirated, injected a scolicidal agent, and reaspirated. A transhepatic approach is used in percutaneous puncture. When the cyst

fluid is aspirated, it should be carefully examined for the presence of bilirubin. When the cyst fluid is contaminated with bile, scolicedal agents may cause chemical cholangitis. When this occurs, sclerosing agent should not be injected, and a therapeutic ERCP should be performed following a cystogram. Various agents can be used as scolicedal agents (hypertonic saline, ethanol, and polidocanol). A recent review published in the Cochrane database has compared PAIR with other methods and indicated that it was superior to medical therapy and associated with less complication and shorter hospital stay compared to surgical therapy [7].

The complications of the PAIR procedure include anaphylaxis, pneumothorax, infection of cyst cavity, and development of biliary fistulae. During the procedure, there may occur allergic reactions varying from mild itching to urticarial skin rash, bronchospasm, and anaphylactic shock. Anaphylaxis is an adverse sudden-onset hypersensitivity reaction that may manifest itself with a severe clinical presentation. It may result in death due to vascular collapse and airway obstruction. It is a sudden-onset hypersensitivity reaction caused by the mediators released by mast cells and basophils as a result of an IgE-mediated immunological reaction. The most important cause of anaphylaxis is the release of cyst content into the systemic circulation. IL-4 level and cyst size have been defined as independent risk factors for echinococcosis-induced perioperative anaphylactic shock [8].

A systematic review has indicated that during percutaneous drainage procedures the rates of lethal anaphylaxis and reversible allergic reactions are 0.03% and 1.7%, respectively [9]. When anaphylactic shock is suspected, the first step to be taken is the elimination of the underlying cause, providing 100% oxygen and rapid fluid support, and stopping all anesthetic agents. Adrenaline should be considered as the first-line treatment owing to its vasoconstrictor and bronchodilator properties. Although the use of corticosteroids, antihistaminics, and aminophylline is of secondary importance, it has been reported that the combination of corticosteroids with H1 and H2 receptor blockers is useful. Our patient was also administered oxygen support and intravenous adrenaline, methylprednisolone, and antihistaminic.

The elimination or minimization of cyst fluid, pseudotumor appearance, semisolid appearance with a heterogeneous content, and an irregular and thickened cyst wall is all important morphological alterations that signal a successful percutaneous therapy [10]. We also noted on ultrasonographic examination that the cysts collapsed after the percutaneous therapy.

Conclusion

Early detection and management of anaphylaxis during the puncture of a hydatid cyst lesion are of paramount importance for the reduction of mortality and morbidity. We are of the opinion that mortality and morbidity of these patients can be greatly reduced by keeping in mind that patients may develop anaphylaxis during the PAIR procedure and by taking necessary measures should it occurs.

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