

Case report

An Intraoperative Anaphylactic Shock Due to a Hydatid Cyst

Zeynep Nur AKÇABOY, Erkan Yavuz AKÇABOY, Nermin GÖĞÜS

Ankara Numune Eğitim ve Araştırma Hastanesi 1. Anesteziyoloji ve Reanimasyon Kliniği, ANKARA

ÖZET

Kist hidatiğe bağlı intraoperatif anafilaktik şok

Kist hidatik dünyanın bazı bölgelerinde görülen endemik bir hastalıktır. Antijenik özelliği yüksek olan kist içeriğinin kan dolaşımına karışması sonucu oluşan immunoglobulin E (IgE) aracılı anafilaksi, nadir ancak çok ciddi bir peroperatif komplikasyondur. Bu yazıda, kist hidatiğin cerrahi tedavisi esnasında anafilaksi gelişen bir olgu sunulmaktadır.

Anahtar Kelimeler: Hidatik kist; anafilaktik reaksiyon; anestezi

ABSTRACT

Hydatid disease is an endemic disease in some geographical areas of the world. IgE (immunoglobulin E) mediated anaphylaxis due to the passage of highly antigenic hydatid cyst content into the bloodstream, is a rare but very serious perioperative complication. In this report, a patient who developed anaphylactic shock during the surgical treatment of the hydatid cyst is presented.

Key Words: Hydatid cyst; anaphylactic reaction; anesthesia

INTRODUCTION

Hydatid disease is a zoonotic infection caused by the larval cysts of *Taenia echinococcus* or *Echinococcus granulosus*. Within the life cycle of the parasite, humans are the intermediate host, housing the larval stage of the parasite¹⁻³.

Today, surgical intervention is the primary effective treatment of hydatid disease. The cyst cavity is filled with highly antigenic fluid and small secondary cysts that develop from the germinal layer. During surgery, the cysts must be manipulated carefully to prevent spillage of the antigenic fluid which can cause serious IgE (immunoglobulin E) mediated anaphylactic reactions. Different published reports on the surgical removal of the hydatid cyst have indicated that anaphylactic shock occurs in 0.2-3.3% of the patients⁴. This report discusses a case of intraoperative hydatid anaphylaxis.

CASE

A 28 year old woman weighing 60 kgs was admitted to the emergency department of our hospital with severe right upper quadrant pain, nausea and vomiting. She has been suffering from episodic right upper quadrant pain, stomachache and nausea. No hypersensitivity reaction was described in her past medical history.

Rebound tenderness was detected in the physical examination. Laboratory data upon admission are shown in Table 1. Indirect hemagglutination titer was found to be 1:64. In the ultrasound imaging, thickening of the wall of the gallbladder, multiple gall stones in the lumen and changes consistent with cholecystitis were demonstrated. A 6x6 cm cystic lesion in posterosuperior localization of the liver was also detected. She was scheduled for an emergency surgical intervention for cholecystectomy and explorative laparotomy.

Table 1. Laboratory Data of the Patient on Admission

	Laboratory Data	Normal Values
Na (mmol/L)	132	135-145
K (mmol/L)	3.8	3.5-5.5
Cl (mmol/L)	107	98-110
AST (U/L)	320	0-37
ALT (U/L)	380	0-40
ALP (U/L)	154	44-132
GGT (U/L)	448	0-50
Hb (gr/dL)	12.7	12.0-16.0
Leukocyte (K/uL)	12500	4000-10000
Eosinophil	0.903	0.00-0.70
Fibrinogen (g/L)	3.9	1.8-3.5

General anesthesia was induced with 75 µg fentanyl, 375 mg thiopental sodium and 6 mg vecuronium and maintained with sevoflurane 1.5-2% in 60% NO₂+40% O₂ mixture. For allergic reaction prophylaxis 120 mg metilprednisolone, 10 mg chlorphenoxamine hydrochloride and 50 mg

Correspondence:

Zeynep Nur AKÇABOY M.D.
Numune Teaching and Research Hospital, Ankara
e-mail: zakcaboy@yahoo.com
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ranitidine hydrochloride were administered intravenously.

At the beginning of the operation, patient was haemodynamically stable with a heart rate of 85 bpm, systolic and diastolic arterial pressure of approximately 140/75 mmHg, O₂ saturation of 97% and ETCO₂ of 28 mmHg. After performing cholecystectomy, hydatid cyst was explored. The operating team decided to aspirate and dissect the cyst and the cavity. Savlon^R 10% (1.5% cetrimide +0.15% chlorhexidine) was applied to the cyst cavity as a scolical agent which was followed by hydatid cyst fluid aspiration.

While emptying the cysts, approximately in the first hour of the operation, the patient developed bradycardia (40 bpm). Then a sudden decrease in blood pressure (60/40 mmHg) and an increase in the heart rate (>100 beats/min) occurred.

Thereafter O₂ saturation decreased to 60% and Paw increased to 45 cm H₂O. Severe bronchospasm and rhonchus were detected on auscultation. Patient's tongue was grossly swollen.

The anesthetic gases were stopped and the patient was ventilated with 100% O₂. For rapid IV volume replacement, 1000 mL of colloids and a 3000 mL of balanced electrolyte solution were administered. Dopamine infusion at a rate of 0.2 µg/kg/min was started simultaneously.

Consequently 0.1 mg s.c adrenaline, 100 mg i.v prednisolone, 240 mg i.v aminophylline were administered. Patient remained in this condition approximately for 40 minutes. O₂ saturation increased gradually afterwards, up to 88%.

Bronchospasm was resolved but sibilant crackles were still evident. Paw slowly decreased to 30 cm H₂O. Arterial blood gas analysis showed metabolic acidosis which was attempted to be corrected by 1/6 molar sodium bicarbonate. Dosage of the molar sodium bicarbonate was calculated with following formula (0.3 x body weight x base deficit). Half of the calculated dose was given in two hours and the other half was infused in 6 hours. Operation took more than 2 hours. At the end of the operation, arterial pressure increased to 110/55 mmHg and the heart rate was found to be 92 bpm. O₂ saturation, ETCO₂ and Paw were 95%, 38mmHg and 28 cm H₂O, respectively.

Patient was not extubated and referred to the intensive care unit (ICU). She remained on assist control ventilation for 4 hours. In the first hour upon admission to the ICU, erythema was developed on the chest wall. At the 4th postoperative hour in the ICU, the O₂ saturation rised to 98% while she was irritated by the presence of the endotracheal tube hence she was

extubated. No other complication was reported during the postoperative period. Bronchodilator therapy and postural physiotherapy were continued in the ICU. Steroid therapy was tapered and stopped on the 3rd day. She was discharged from the ICU and transferred to the ward where she was discharged from hospital on the 8th day with clinical recovery. Presumptive diagnosis of the hydatid disease was also confirmed by the histological examination of the surgical specimen.

DISCUSSION

IgE mediated anaphylaxis, due to the high concentration of antigens in the blood stream, is a serious, but fortunately an infrequent complication of surgery and anesthesia. The most devastating manifestation is the anaphylactic shock.

Anaphylaxis may occur at any time during anesthesia and may progress slowly or rapidly⁵. Awareness is essential because these reactions may be well established before the time they are noticed. The most commonly reported initial features are pulselessness, difficulty in lung insufflations and desaturation. Decreased ETCO₂ is also a valuable diagnostic finding⁶. Anaphylaxis involves virtually all of the organ systems including the skin, cardiovascular and respiratory systems as well as gastrointestinal, central nervous and genitourinary systems⁵. Clinical feature may occur as an isolated condition.

Therefore, an anaphylactic reaction restricted to a single organ system like bronchospasm, or tachycardia with hypotension, can easily be misdiagnosed, because many pathological conditions may present as identical clinical manifestations⁷. Nevertheless, differential diagnosis with drug or latex induced anaphylactic shock, hypovolemic shock, acute heart attack, carcinoid syndrome and tension pneumothorax in a patient under mechanical ventilation should be considered as well. Because of the extreme severity of the anaphylactic shock, clinical diagnosis is at most importance, since an early treatment is essential for the successful clinical recovery of the patient⁸.

Anaphylaxis may be triggered by multiple agents. One of these is the hydatid cyst due to its high antigenicity. Allergic reactions during hydatid cyst operation can occur due to dispersion of highly antigenic cyst content into the blood stream as a result of spontaneous traumatic rupture or iatrogenic puncture⁹. These reactions can be as mild as pruritis and urticaria or can be as serious as an anaphylactic shock². When an intraoperative shock is encountered, the rupture of a hydatid cyst must be kept in mind as a likely cause, especially when dealing with patients from

endemic areas¹. In the case of cardiovascular collapse, bronchospasm and erythema, early clinical diagnosis is very important.

Several laboratory tests have been described for echinococcus in the literature. Because of the sudden occurrence of anaphylactic reaction, the benefits of these tests are controversial⁵. In our case, there was no past medical history of allergic reactions. Since the case was emergent, only indirect hemagglutination test was performed. We also assume that, occurrence of the anaphylactic shock due to the spread of the cyst content into the surrounding tissue, could not be prevented by performing the specific allergic tests before the operation.

Since the administration of benzodiazepines, corticosteroids and H₁-H₂ receptor antagonists are beneficial in reversing the effects of histamine release^{5,6}, sodium thiopentone, methylprednisolone, chlorphenoxamine hydrachloride and ranitidine hydrochloride were administered to the patient at induction.

Treatment of an anaphylactic shock due to a hydatid cyst resembles the treatment of an

anaphylactic shock resulting from any other cause¹⁰. We stopped administering anesthetic gases and ventilated the patient with 100% O₂.

Simultaneous i.v volume replacement was initiated. Dopamine infusion, subcutaneous adrenalin, additional IV steroids and bronchodilators were also administered. Metabolic acidosis was corrected by sodium bicarbonate administration.

Hypertonic saline, formalin, cetrimide, chlorhexidine, hydrogen peroxide and ethyl alcohol can be used as scolical irrigation materials for the cyst cavity. In this case, cetrimide with chlorhexidine (Savlon^R) was used. Moreover, metabolic acidosis was recorded as a very rare complication due to the application of cetrimide into the cyst cavity¹¹.

An anaphylactic reaction during hydatid cyst surgery is a rare but significant adverse event, especially in the case of a sudden hemodynamic worsening. Detailed diagnostic and therapeutic protocols as well as emergency medications must be available in the operating room. Furthermore education for the management of allergic reactions must be advised in anesthesia practice.

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