

## CASE REPORT

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# Perioperative anaphylactic shock in a patient with unruptured hepatic hydatid cyst: a case report

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## ABSTRACT

Hydatid cyst disease is an infection most frequently caused by the larval form of a parasite named *Echinococcus granulosus*. Spillage of hydatid fluid during open surgery has been shown to result in serious anaphylactic reaction. We report a case of 46 years old male with hydatid cyst of liver, who had a sudden onset of intra-operative hypotension, tachycardia, flushing, edema and bronchospasm. He was managed with adrenaline, antihistaminics, steroids, supplementary fluids and vasopressors, and after successful resuscitation, was shifted to ICU for further management. Four days later, he was weaned off from vasopressors and ventilatory support and shifted to the surgical ward. Early diagnosis and intervention are crucial for successful management of the anaphylactic reactions.

**Key words:** Hydatid cyst; anaphylactic shock; liver

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## INTRODUCTION

Hydatid cyst disease is an infection most frequently caused by the larval form of a parasite named *Echinococcus granulosus*<sup>1,2</sup>. Hydatid cysts of the liver have been treated surgically for many years by several surgical techniques including marsupialization, evacuation, and filling the cyst with saline after evacuation of the endocyst<sup>2-4</sup>. Surgery for hydatid cysts of the liver has been associated with spillage of the antigenic hydatid fluid into the peritoneal cavity or direct contact with the bloodstream resulting in serious IgE-mediated anaphylactic reaction<sup>3-7</sup>. Most anaphylactic reactions encountered in open surgery for hepatic hydatid cysts occur when the cysts are deeply seated into the liver, and thus require a hepaticotomy<sup>4,6</sup>. We present a case report of such a reaction during an open surgery of hydatid cyst of the liver.

## CASE REPORT

A 46-year-old male complained of abdominal and flank pain and fever for many months. Ultrasonography and computed tomography of the abdomen showed a cyst of the liver. Preoperative examination of the cardiovascular and respiratory systems was normal and he had no history of allergy. The patient was premedicated with 0.07 mg/kg midazolam IM. The anesthesia was induced with 0.05 µg/kg fentanyl, 0.1 mg/kg vecuronium and 7 mg/kg thiopentone sodium IV. Endotracheal intubation was done using a 8.5mm endotracheal tube. The patient was continuously monitored by electrocardiography (ECG), noninvasive blood pressure monitor, pulse oximetry and end-tidal capnography. Anaesthesia was maintained with 50% O<sub>2</sub>:50% N<sub>2</sub>O and isoflurane. The patient was hemodynamically stable at the onset of the operation with

blood pressure (BP) at 120/80 mmHg and heart rate (HR) 90/min. Until approaching the cyst, hemodynamic signs continued to remain stable. Just before touching the cyst 20 mg diphenhydramine and 4 mg dexamethasone sodium were injected IV. After the starting of cyst excision procedure there was a sudden increase of HR to 140 bpm and a decrease of BP to 80/40 mmHg. 10 mg ephedrine was administered and infusion rate of fluids was increased. Instantly, a radial arterial catheter was passed to measure blood pressure invasively. Suddenly, the patient desaturated from 99% to 85% and his BP dropped to 60/30 mmHg. He was with 100% O<sub>2</sub> and isoflurane was switched off. Prednisolone 2 mg/kg, ephedrine 20 mg, adrenaline 0.1 mg and ranitidine 40 mg were administered IV. Due to persistent hypotension, infusion of dopamine at a rate of 20 µg/kg/h and an infusion of adrenaline at a rate of 0.2 mg/h were started. Arterial blood gas (ABG) analysis showed hypoxemia (PaO<sub>2</sub>: 52 mmHg, PaCO<sub>2</sub>: 60 mmHg, pH: 7.1, serum bicarbonate: 22 mmol/l and SpO<sub>2</sub>: 88% on FiO<sub>2</sub> of 1). His BP was 30/10 mmHg now. The patient had diffuse erythema of whole of the body, edema of head and neck and bronchospasm. A central venous catheterization was administered and central venous pressure (CVP) was measured to be 6 mmHg. After the BP rose to 70/40 mmHg, the operation was allowed to proceed. The cyst was excised in toto. After a few moments BP increased to 90/50 mmHg, and remained stable till the end of the operation at 90/60 mmHg. HR was then 130 bpm and ABG's now showed improvement (PaO<sub>2</sub>: 69 mmHg, PaCO<sub>2</sub>: 47 mmHg, pH: 7.2, serum bicarbonate: 22 mmol/l and SpO<sub>2</sub>: 90%). The patient was admitted to ICU and electively ventilated for 21 hours. He was extubated after full normalisation of ABG's and hemodynamic status at the 21st hour and discharged from ICU to surgical ward at the 4th day.

## DISCUSSION

Anaphylaxis is a severe, life-threatening, hypersensitivity reaction<sup>7</sup>. In recent years anaphylactic reactions during anesthesia are becoming a common problem<sup>8</sup>. However, the incidence of intraoperative anaphylaxis due to hydatid cyst has been reported to be low at 0.2-3.3% and is usually associated with spillage of its highly antigenic contents into the body cavities or systemic circulation<sup>9</sup>. It may present with signs like flushing, edema, bronchospasm, hypotension and tachycardia<sup>10-12</sup>. The present report describes a typical anaphylactic reaction as manifested by severe hypotension, tachycardia, flushing, and edema.

The allergic reaction can be in a range from a mild hypersensitivity reaction to a fatal anaphylactic shock. In

this case, the cystic walls were intact, and we believe that high intracystic pressure coupled with blunt dissection must have been the cause of leakage of cystic fluid into the bloodstream. In our case, there was an anaphylactic reaction secondary to the diffusion of the highly antigenic hydatid fluid directly into the bloodstream, as there was no macroscopic rupture of the cyst. In the literature few anaphylactic reactions have been reported without macroscopic ruptures of the hydatid cysts<sup>13,14</sup>.

In an operation for a hydatid cyst removal, the possibility of an anaphylactic or anaphylactoid reaction should always be considered when there is unexpected, sudden, severe hypotension and tachycardia. Bronchospasm, skin and mucosal erythema may be late or obscured signs. Early aggressive therapy with intravenous adrenaline is crucial and the drug of choice in the management of such cases<sup>15</sup>. In addition, inhalation anesthetics should be stopped just after the diagnosis of anaphylaxis, 100% oxygen administered and the intravascular volume replaced with colloid or crystalloid fluids. Histamine receptor antagonists may be administered. The use of vasopressors should be considered.

## CONCLUSION

In conclusion, in hydatid cyst surgery of the liver, anesthetists must remain vigilant for an anaphylactic reaction. An intubated patient with anaphylactic reaction provides easy control of airway and early diagnosis and intervention are crucial for a successful outcome in a patient with anaphylactic shock.

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