

# Intraoperative anaphylaxis caused by a hepatic hydatid cyst

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## ABSTRACT

**Anaphylactic and anaphylactoid reactions during anaesthesia are a major cause of concern for anaesthesiologists. During the perioperative period, any symptomatology relating to sudden-onset haemodynamic collapse or increased airway pressures during certain surgical procedures should raise suspicion of anaphylaxis. We report a case of anaphylaxis during pericystectomy for hydatid cyst of the liver intraoperatively in a 29-year-old Indian woman. Although a rare occurrence, reporting of such perioperative events is crucial for future references. Anaphylactic reactions should be seriously considered whenever a hydatid cystectomy is performed, especially in the event of a sudden haemodynamic collapse. Early diagnosis and correct treatment are essential to ensure a favourable patient outcome.**

**Keywords:** anaesthesia, anaphylaxis, hydatid cyst, pericystectomy

*Singapore Med J 2011;52(2):e18-e19*

## INTRODUCTION

Anaphylactic and anaphylactoid reactions during anaesthesia are a major cause of concern for anaesthesiologists. During the perioperative period, any symptomatology relating to sudden onset haemodynamic collapse or increased airway pressures during certain surgical procedures should raise suspicion of anaphylaxis.<sup>(1)</sup> We report a case of intraoperative sudden anaphylaxis and its management.

## CASE REPORT

A 29-year-old Indian woman weighing 48 kg presented with complaints of pain in the abdomen that was accompanied by occasional vomiting in the past two months. Evaluation revealed a 6 cm × 5 cm × 5.5 cm hydatid cyst in segment VI and VII of the liver; she was subsequently scheduled for pericystectomy. Preoperative examinations of the cardiovascular and respiratory systems were normal. Laboratory evaluations, including haematological and biochemical profile, were within

normal limits. The patient was premedicated with diazepam (5 mg) and ranitidine (150 mg) at night and the following morning. In the operation room, routine monitors (electrocardiogram, non-invasive automated blood pressure, pulse oximeter [SpO<sub>2</sub>]) were attached. Anaesthesia was induced with fentanyl (40 µg), thiopentone (250 mg) and succinylcholine (100 mg). Tracheal intubation was performed using a 7.5-mm internal diameter cuffed endotracheal tube. Temperature, capnography (EtCO<sub>2</sub>) and urine output monitoring were also initiated. Ventilation was maintained with intermittent positive pressure ventilation at the rate of 12 breaths/min, and tidal volume of 400 mL. Anaesthesia was maintained with isoflurane in oxygen and nitrous oxide (50:50), along with top-ups of vecuronium. Analgesia was provided using intravenous morphine (5 mg).

During surgery, when the patient's liver was lifted in order to aspirate the cyst, the inferior vena cava became compressed. This led to a fall in the patient's blood pressure, which returned to baseline when the liver was resumed to its normal position. A few minutes later, soon after the aspiration of the cyst, sudden and persistent desaturation (SpO<sub>2</sub> 20%), hypotension (systolic blood pressure 35 mmHg), hypocarbia (EtCO<sub>2</sub> 10 mmHg) and bradycardia (heart rate 36/min) were noted. Isoflurane was discontinued and fluid resuscitation was started. Persistent desaturation could not be corrected with institution of 100% oxygen. Hypotension did not respond to fluids, and peak airway pressure increased to 40 cmH<sub>2</sub>O. On auscultation of the patient's chest, bilateral rhonchi were present. Generalised oedema with presence of erythema was observed. A diagnosis of anaphylactic reaction was made. A 200-µg bolus of adrenaline was administered intravenously to the patient, followed by an infusion of 500 µg/hr. Hydrocortisone sodium succinate (100 mg) and chlorpheniramine maleate were administered intravenously. The blood pressure gradually improved and in the next two hours, the patient's SpO<sub>2</sub> increased to 95% and the systolic blood pressure increased to 100 mmHg. An enucleation and marsupialisation was then performed successfully.

The patient was then moved to a high dependency unit, where she received ventilatory support for two days. Adrenaline infusion at the rate of 500–1200 µg/hour was

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given for 24 hours and gradually tapered. A central venous pressure line was placed and arterial blood gas analysis was done, which showed non-respiratory acidosis. After ten hours, the patient regained consciousness; however, she still required inotropic support with adrenaline. Over the next 24 hours, the inotropic dose was gradually decreased and then stopped. The trachea was extubated on the third postoperative day, and the patient was discharged after one week.

## DISCUSSION

It has been estimated that anaphylaxis is responsible for one life-threatening situation in every five to 10,000 anaesthetic procedures, and that once a reaction starts, the mortality rate is 3%–6%.<sup>(1)</sup> In our case, the haemodynamic and respiratory problems appeared to be primarily related to anaphylaxis due to hydatid cyst contents. Nevertheless, differential diagnosis with drug- or latex-induced anaphylactic shock, hypovolaemic shock, acute myocardial infarction, carcinoid syndrome and tension pneumothorax in a patient under mechanical ventilation should also be considered. In our patient, sudden haemodynamic collapse occurred during the handling of hydatid cyst contents. Early diagnosis and prompt treatment are crucial for recovery from the catastrophe.

Infection with *Echinococcus granulosus* or *Echinococcus multilocularis* leads to cystic lesions in the liver and lungs.<sup>(2)</sup> During surgical removal of the hydatid cyst, it may get ruptured, releasing highly antigenic contents in circulation, which causes IgE-mediated anaphylactic reactions.<sup>(2)</sup> Some reports have cited a 0.2%–3.3% incidence of anaphylactic shock following surgical removal of hydatid cysts.<sup>(2)</sup> Early diagnosis is important in the wake of cardiovascular collapse, bronchospasm and generalised erythema. Overall, during medical and surgical procedures, muscle relaxants have been shown to be responsible for 60%–70% of the anaphylaxis cases, latex for 10%–20%, antibiotics for 5%–20%, and colloids and induction agents for about 3%–5% of cases.<sup>(3)</sup> The

increasing use of latex-containing materials has been associated with anaphylaxis.<sup>(3,4)</sup> All patients suspected of having an allergic reaction should have plasma histamine, tryptase and specific IgE concentrations determined at the time of the reaction and again, at one and six hours after the reaction. Skin tests should also be carried out at six weeks.<sup>(1)</sup>

Anaesthetists should always consider the possibility of an anaphylactic or anaphylactoid reaction when they encounter cases of unexpected, sudden or severe hypotension. Bronchospasms occur less than half of the time under general anaesthesia, and skin and mucosal presentations may be late or obscured in patients undergoing surgery. A high index of suspicion and early aggressive therapy with intravenous adrenaline are vital. In the management of such cases, adrenaline is the drug of choice.<sup>(5)</sup> In addition, inhalation anaesthetics should be stopped, 100% oxygen administered and the intravascular volume replenished with colloid or crystalloid. H<sub>1</sub> and H<sub>2</sub> antagonists may be given prophylactically. There have also been reports of the use of vasopressors with alpha- and beta-stimulating properties.<sup>(5,6)</sup>

Reporting of such rare perioperative events is crucial for future references. An anaphylactic reaction has to be taken into serious consideration whenever a hydatid cystectomy is performed, especially in the event of a sudden haemodynamic collapse. An early diagnosis and correct treatment are essential to ensure a favourable patient outcome.

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