

Hydatid Cysts Of The Liver Complicating With Inferior Venacaval Thrombous And Right Ventricular Outflow Obstruction, Posted For Emergency Laparotomy

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Abstract

Very few cases have been reported about extra thoracic compression of the heart by a giant hepatic hydatid cyst¹. Emergency decompression of the cyst is the only treatment option. Anaesthetic management in this unstable hemodynamic condition is difficult and challenging. We report a case of multiple hepatic hydatid cysts with one giant cyst causing right ventricular obstruction. There were also multiple inferior vena cava thrombus and atelectasis of right lower lung.

INTRODUCTION

A hydatid cyst is the larval stage of echinococcosis, a zoonosis in which human are an intermediate host of the larval stage of the parasite. There are four echinococcus species, of which *E granulosus* (cystic hydatid disease) and *E multilocularis* (alveolar hydatid disease) are the most important.

The majority of the hydatid cysts affect the liver followed by the lungs, brain, peritoneal cavity kidneys and bone marrow and other organs. Thoracic complications of hepatic hydatid cysts result from the proximity of hydatid cysts to the liver and the diaphragm and are seen in approximately 0.6% to 16% of cases.^{3, 4}

The purpose of this report is to present a unique case report of anaesthesia and Perioperative management of gigantic complicated hydatid cysts, causing thrombosis of the inferior vena cava, atelectasis of right lower lung and right ventricular outflow obstruction.

CASE REPORT

A 54-yr-old woman was admitted to the hospital presented with breathlessness. She had gradual increase in difficulty in breathing from last six month Chest X-ray revealed atelectasis of the right lower lobe, elevation of the right diaphragm. Ultrasonography revealed multiple cyst of liver with one large cyst compressing the right hemithorax and one compressing the inferior vena cava (IVC). The patient

was posted for emergency laparotomy for decompression and excision of the cysts.

During transferring to Operation Theater, patient had cardiac arrest. Because of possibility of ruptured of cyst causing anaphylaxis, immediately injection adrenaline 1mg IV given. Patient resuscitated. Immediately echocardiography was done.

Echocardiography revealed multiple hydatid cysts with one large cyst, around 15X10cm compressing the right ventricle and obstructing the right ventricular outflow and multiple small IVC thrombi were diagnosed by Doppler.

Patient laboratory investigation showing hemoglobin-10mg/dl, normal liver functions, and mild elevation of renal parameters.

After shifting to Operation Theater and connecting monitors. The patient had a heart rate of 180/ minute possibly due to some contribution of adrenaline with non invasive blood pressure of 80/60 mmhg and saturation of 82% in room air and 86 % with 100% oxygen. Two large bore IV cannula in both the upper limb and central line (right internal jugular vein) was secured and central venous pressure (CVP) measured showing 15mmhg. Invasive blood pressure (Left radial) showing blood pressure of 74/56 mmhg.

Anti anaphylaxis measured like Injection adrenaline, antihistamine, and theophylline and steroid are kept ready.

The patient was premedicated with Fentanyl 70 µg and midazolam 1mg, induced with 100 mg thiopentone and 75 mg suxamethonium and intubated with size '7' cuffed PVC endotracheal tube. Post induction blood pressure was decreased to 64/46 mmhg, with dopamine 10 µg increased to 80/60 mmhg. Anaesthesia was maintained with injection fentanyl, Isoflurane up to 0.6 MAC and vecuronium bromide. Mean blood pressure maintained around 65 mmhg with the inotropes and fluid.

Laparotomy revealed multiple hydatid cysts of the liver and four large cysts, one on posterior surface of the liver compressing the thorax and one compressing the inferior vena cava. During manipulating for dissecting the giant cyst of the liver which was compressing the heart, CVP fluctuated from 2 to 20 mmhg and IBP from 50 to 100 mmhg of systolic blood pressure. SPO₂ was between 80 to 100% with 50% oxygen in nitrous oxide and airway pressure increasing up to 40 mmhg. Dissecting and excision of the main giant cyst took around one hour. After excision of cyst blood pressure improved to 100/70 mmhg and gradually out of inotropic support.

After excision of the second cyst which was compressing the IVC, Scolicidal agent cetrimide was used and more than 100 cysts were excised.

The possibility of dislodgement of the IVC thrombus was kept in mind through out operation. We planned for postoperative anticoagulation and if require placement of IVC filter. After closure of the laparotomy patient was sifted to ICU and was on ventilatory support. The right lower atelectatic lung was gradually improved with physiotherapy, nebulisation and recruitment maneuvers. Patient was covered with antibiotics and heparin. Tablet Albendazole 400 mg once daily started through nasogastric tube and continued for one month. Patient was extubated on fifth postoperative day. Room air saturation was 95 to 98% and discharged from ICU.

DISCUSSION

Hepatic hydatid cysts can cause extra thoracic compression of lung, heart and may rupture into adjacent hemithorax and peritoneum. Large cysts can cause pressure effect on inferior vena cava (IVC) leading to thrombosis and embolism. Large cysts compressing the heart can lead to cardiac tamponade and arrest as in this case.

The main concern during operation was haemodynamics

unstable. In this case there was wide range of fluctuation of CVP from 2 to 20 mmhg during manipulation and resection of the cyst. Another concern is the awareness of anaesthesia. It is usual to decrease the concentration of inhalational anaesthetic agent when there is fall in arterial pressure which can lead to awareness. Most of the anaesthetic agents cause decrease in systemic vascular resistance and/or decrease cardiac output. It is better to start minimum inotropic support before induction, titrate to target a mean arterial pressure above 65 mmhg and maintained with minimum concentration of inhalational anaesthetic agent. Monitoring like BIS if available should be done to detect awareness during anaesthesia.

Surgery is clearly indicated in cysts of any type that have any form of complication.¹⁰

Common Operative treatment of hydatid cysts of the liver involve, total removal of all infective component of cyst, avoiding cyst content spillage, scolical agent to be placed within the cyst, if present managements of communications between the cyst and biliary tract.

The main surgical options available for liver cyst are cystectomy, pericystectomy, and partial hepatic resection. Surgeries for pulmonary cysts include extrusion of cysts (Barrett's technique), pericystectomy and lobectomy.

The clinical presentation of thoracic involvement of hydatid cyst of the liver is predominately pulmonary; with the most frequent symptoms being chest pain and productive cough that appears 1 to 24 months before the final diagnosis^{5, 6}. This is a rare case which was presented as extrathoracic compression of heart by a giant hydatid cyst.

The common scolical agents are Cetrimide (0.5%), hypertonic saline (20%), silver nitrate (0.5%), ethanol (75-95%), sodium hypochlorite (3.75%). They have potential for direct and indirect toxicity. (Estimated 20% cysts are communicated with the biliary tract).

Hydatid cysts of lungs indicate double-lumen intubation of the trachea during surgery to control ventilation and prevent flooding of the contralateral lung.^{11, 12} Choice in ventilation should be extended to some hydatid cysts of the liver with thoracic involvement.^{6, 7}

Most common site of hydatid cyst of bone is vertebrae. Many of them develop epidural extension with compression of spinal cord and paraplegia. Upon 20% patient have

multiple cysts, so diagnosis of each patient should be screen for other sites of cyst like lung, brain, kidney, bone etc.

Factors participate in promoting intrathoracic evolution of hydatid cysts of the hepatic dome are pressure gradient between thoracic and abdominal cavities, mechanical compression and ischemia of the diaphragm, sepsis in the hepatic cyst, or chemical erosion by bile.

Allergic reactions can appear after the rupture of a hydatid cyst and can range from mild hypersensitivity to fatal anaphylactic shock.^{8, 9}

Puncture - aspiration of cyst contents -infusion of scolical agents and re-aspiration (PAIR) has been used as a percutaneous treatment in the management of cystic echinococcosis of the liver, peritoneum, spleen, kidneys and muscle.⁸ PAIR is contraindicated for superficially located cysts, for cysts with multiple thick internal septae and for cysts communicating with the biliary tree. Leyla et al described a case of sedation for percutaneous treatment of hepatic hydatid cyst in a pregnant patient⁹.

The Laparoscopic Approach to Abdominal Hydatid Cysts has been described using the Isolated Hypobaric (vacuum) Technique.^{11,12} The principle like that of PAIR through a large-diameter transparent cannula, which enables supervision from outside. The cannula has a beveled tip that is apposed firmly to the surface of the cyst by suction applied through its lateral stopcock, to create a “vacuum” (hypobaric) atmosphere inside the cannula, which then serves as an isolated working unit.

Anaesthetic implication of this case included

- Hemodynamic instability
- Difficulty in ventilation due to atelectasis of right lower lung and surgery over the anatomical site.
- Chance of rupture of cysts during surgery which may lead to anaphylaxis.
- Possibility of dislodgment of thrombus from IVC can leads to pulmonary embolism.
- Awareness

- Rarely Scolicidal toxicity

In conclusion, thoracic involvement of hydatid cyst of liver is predominantly pulmonary. This is a rare case which involves extrathoracic compression of heart causing right ventricular outflow obstruction. Because of hemodynamic instability, invasive monitoring like central venous pressure and continuous arterial pressure is very much helpful.

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