Archives of Anesthesiology and Critical Care (Summer 2023); 9(3): 265-267.

Available online at http://aacc.tums.ac.ir

Case Report

Anaesthetic Considerations in Simultaneous Management of Pulmonary and Hepatic Ruptured Hydatid Cyst: A Case Report

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ARTICLE INFO

Article history:
Received 21 May 2022
Revised 12 Jun 2022
Accepted 26 Jun 2022

Keywords:
Ruptured hydatid cyst;
Bronchopleural fistula;
Anaesthesia for thoracotomy;
Lung protective ventilation

ABSTRACT

Administering anaesthesia in ruptured hydatid cyst of lung/liver has always been challenging. The major perioperative goal of management in such patients include protection of healthy lung, chance of anaphylaxis, deranged liver enzymes and coagulation profile, hepatic resection, postoperative management of bronchopleural fistula, blood loss and analgesic management of large incision. We report a case of successful management of a 40-year-old male with hepatic and pulmonary ruptured hydatid cyst with bronchopleural fistula under general anaesthesia (using double lumen tube) and thoracic epidural.

Hydatid disease is caused by larval cysts of Echinococcus granulosus or echinococcus multilocularis. The liver (60%) and lungs (30%) are the most common sites. Humans are accidental intermediate hosts [1]. Intrathoracic rupture of hepatic Echinococcus cyst is a rare complication that implies erosion of diaphragm and rupture of the cyst into bronchus or pleural cavity with high chances of fatal anaphylaxis [2-3]. Here, we report a case of a patient with ruptured hepatic hydatid cyst into pleural cavity with bronchopleural fistula posted for hepatic hydatid cyst deroofing and omentoplasty with decortication of right lung under general anaesthesia and thoracic epidural.

Case Report

40-year-old male presented with complaints of cough with expectoration and shortness of breath for 2 months, later he developed fever and hemoptysis for 1 week. Routine blood investigations revealed raised total leucocyte count and deranged blood sugar levels, rest were within normal limits. Chest Xray showed collapse consolidation of the right lower zone (Figure 1). He was started on empirical antibiotics and other supportive management.

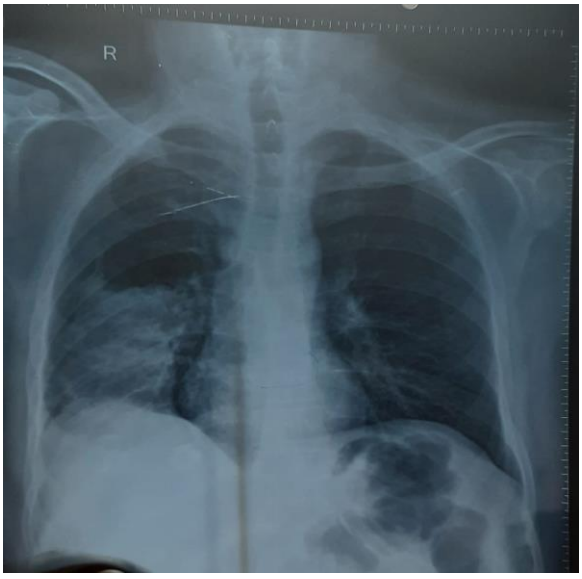

Figure 1-Preop cxr of a patient with ruptured hepatic hydatid cyst into pleural cavity

Since there was no improvement in his symptoms, CECT thorax and abdomen was taken and it showed ruptured hepatic hydatid cyst into right pleural cavity with bronchopleural fistula. Incidentally he was

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diagnosed with right popliteal vein thrombosis and type 2 Diabetes mellitus, for which he was started on anticoagulants and insulin respectively. He was scheduled for hepatic hydatid cyst deroofing and omentoplasty with decortication of right lung.

Preanesthetic evaluation was done, his cardiopulmonary reserve was METs <4, PFT showed FEV1- 63% and FEV1/FVC-107%. Anticoagulants were stopped 24 hours prior to surgery and advised to skip morning dose of insulin on the day of surgery. Plan of anaesthesia was general anesthesia with thoracic epidural. On the day of surgery, patient was taken into the operation theatre after taking written informed consent and high-risk consent in view of poor functional status. Airway equipment as well as drugs for induction and anaphylaxis management were prepared which includes Inj Hydrocortisone sodium and Inj Adrenaline 1:1000. Standard ASA monitors such as SpO2, NIBP and ECG were attached once the patient is taken inside the operating room. Under strict aseptic precautions, after giving local infiltration, thoracic epidural was inserted at T7-T8 level in sitting position, after negative aspiration for blood and cerebrospinal fluid, 3 mL of 2% lignocaine with 15 µg adrenaline was injected as test dose and confirmed negative. The epidural catheter was fixed and secured at 9cm. General anesthesia was induced with Inj Fentanyl 100mcg, Inj Propofol 100 mg and muscle relaxant Inj Vecuronium 6mg IV and intubated with 39F left sided PVC double lumen tube and position was confirmed with a fiber optic bronchoscope. Lung protective ventilation strategies such as low tidal volumes (4-6 ml/kg), lower peak airway pressures (less than 30cm of H2O) to reduce barotrauma, higher positive end expiratory pressure (PEEP- 4-5 cm of H2O) in order to reduce atelectotrauma and lower fractions of inspired oxygen (FiO2) in order to reduce oxygen toxicity were used. After induction, invasive arterial line (22G cannula in left radial artery) and central venous catheter (7Fr CVC on Right IJV) were inserted. Prior to the incision, Inj Hydrocortisone 200mg IV was given slowly as a prophylactic dose to prevent anaphylaxis perioperatively.

Intraoperatively, to prevent the spillage of cyst contents during decortication of lung, one lung ventilation was used. Total duration of one lung ventilation was one hour 10 minutes, during this time to prevent hypoxia due to ventilation perfusion mismatch, PEEP was applied to the ventilated lung and CPAP was given to the non-ventilated lung. Hemodynamics was stable initially, but later during decortication stage bradyarrhythmia occurred and was managed with Inj Atropine 0.6mg IV. For perioperative pain management epidural bolus was given with Inj Morphine 30-50 mcg/kg. Total duration of surgery was around 6 hours with blood loss approximately 400ml (maximum allowable blood loss was estimated at 720ml) and urine output was adequate. At the end of surgery, in view of large bronchopleural fistula, right sided intercostal drain was inserted and patient was planned for elective extubation in ICU. Serial chest X-rays and ABG monitoring were done to look for resolving of bronchopleural fistula and oxygenation status. The patient was finally extubated after ICD removal and adequate expansion of the lungs. Gradually patient got improved and discharged after 10 days.

Discussion

Hepatic hydatid cysts may remain clinically silent for years [4] and diagnosis is often made when complications occur, usually jaundice but also include rupture or secondary infection [5]. Treatment aims to eliminate the parasite and to prevent recurrence [6]. Gold standard treatment modality is always surgical intervention [7].

Anaesthetic implications of a case of hydatid cyst of lung include one lung ventilation. Anaesthesiologist inducing the case should be familiar with Double Lumen Tubes and ensure correct size and positioning of the tube. Proper preoperative assessment of the patient's physical parameters is needed for calculating the right size of double lumen tube. Single lung ventilation is never physiological and is not without complications, yet it is done in specific surgical procedures as it has certain advantages of its own. In pulmonary hydatid cyst, single lung ventilation is indicated to prevent soiling of the contralateral lung during intrathoracic manipulation. Perioperative lung protective ventilation and measures to prevent hypoxemia due to increased intra pulmonary shunting or ventilation perfusion mismatch, by application of either CPAP or Intermittent Positive Pressure Ventilation to the non-ventilated lung is often warranted.

Apart from normal lung protective ventilation, single lung ventilation requires FiO2 on higher side and PEEP of 5-8 cm H2O.

A rare but fatal complication of hydatid cyst surgery includes spillage of cyst contents entering blood stream resulting in fatal anaphylaxis. The symptoms vary from mild urticaria to anaphylactic shock7. Perioperatively under general anaesthesia cardiovascular signs like hypotension, tachycardia and arrhythmias occur predominantly. Bronchospasm is usually rare, whereas cutaneous symptoms like rash, flushing and urticaria are common over the neck, face and anterior chest. The treatment of anaphylactic shock includes massive fluid resuscitation, vasopressors and corticosteroids. However, Inj Adrenaline (1:1000) is the drug of choice perioperatively [8]. Anticipating this complication, a loading dose of corticosteroid, Inj Hydrocortisone 200-300 mg IV can be given prior to the incision. Since in our case, the hydatid cyst was already ruptured, so the chance of anaphylaxis was very minimal.

Providing adequate analgesia helps in earlier extubation and thus in preventing ventilator dependence. Thoracic epidural infusions combined with IV analgesics provide adequate coverage.

In view of large bronchopleural fistula, patient was planned for elective extubation in ICU. Since the fistula was resolving, conservative management with elective ventilation was done. Sometimes in case of large fistula, refractory to mechanical ventilation might need endoscopic spigot application.

Conclusion

Rupture of hepatic or non-hepatic hydatid cysts is a life-threatening complication. We conclude that the anaesthetic management involves various combinations of different modalities like one lung ventilation with lung protection strategies for both ventilated and non-ventilated lung, perioperative anaphylaxis management, management of coagulopathy, analgesic management, arrhythmia management, post operative serial monitoring of chest x-ray, ABG and mechanical ventilation.

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