

Case Report

Anaesthetic Considerations for Management of a Case of Hydatid Cyst Lung with Bronchopleural Fistula and Hepatic Hydatid Cyst for Excision

Babita Ramdev¹, Dinesh Kumar Sharma², Harinder Singh³, Manisha. B. Dwivedi⁴, Sapna Bansal⁵

¹Associate Professor, Department of Anaesthesia and Critical Care, MMIMSR, Mullana, Ambala

²Assistant Professor, Department of E.N.T, Government Medical College, Patiala, Punjab

³Post graduate student of Anaesthesia, M.M.I.M.S.R, Mullana, and Ambala

⁴Associate Professor, M.M.I.M.S.R, Maulana, Ambala

⁵Assistant professor, M.M.I.M.S.R, Maulana, Ambala

*Corresponding author

Babita Ramdev

Email: babitaramdev@gmail.com

Abstract: Hydatid cyst of lungs along with cyst in the liver is quiet challenging to the Anesthesiologist. The anaesthetic considerations include ventilation problems due to one lung ventilation, bleeding and anaphylactic reactions due to cyst rupture. Here we report the management of hydatid cyst lung with liver and the various anaesthetic concerns.

Keywords: Hydatid cyst, double lumen tube, one lung ventilation, anaphylaxis

INTRODUCTION

Hydatid cyst or echinococcosis is an infection in humans caused by larval stage of *Echinococcus granulosus* [1]. The cysts are mostly found in the liver(65%), followed by lungs(20%).The two organs can be simultaneously affected in about 5-13% of the cases [2]. It may also infect the kidneys, peritoneum, brain, bone marrow and other organs. The anaesthetic concerns for surgery of hydatid cyst of the lung includes possibility of rupture of the cyst intraoperatively causing anaphylactic reaction and problems due to one lung ventilation using the double lumen tube. We report here the management of a case of hydatid cyst of lung with bronchopleural fistula with hydatid cyst of the liver.

CASE REPORT

A 22 years female patient presented in the emergency in drowsy and unconscious state with respiratory distress with SpO₂ 33% on air. An urgent chest x ray and ultrasound chest and abdomen showed right side hydropneumothorax, cyst in the lung and a hepatic cyst. An intercostal drain number 32 F was inserted in the 5th intercostal space which improved the SpO₂ to 78% and around 300ml of fluid was drained. Patient had history of chest pain on and off and of taking antitubercular treatment for 9 months. On respiratory system examination the air entry was decreased on the right side. The patient was posted for

thoracotomy with decortication with fistula repair with cyst removal under general anaesthesia. After taking consent and adequate NPO starvation patient was taken up for surgery under general anaesthesia. All monitors were attached and I/V lines were secured. Premedication was done with Injection glycopyrrolate 0.2mg I/V, Injection Midazolam 1mg I/V, Injection fentanyl 100mg I/V. Anaesthesia was induced with Injection Propofol 100 mg I/V and Injection Vecuronium 4mg I/V and intubation was done with 35 F left Double Lumen Tube (DLT). The position of the DLT was confirmed with a flexible fiberoptic bronchoscope. One lung ventilation was checked by clamping the tracheal and bronchial lumen alternatively. Injection Hydrocortisone 100 mg I/V and Injection Chlorpheniramine 1 ampoule I/V were given before the incision to prevent anaphylaxis. Intraoperatively the patient was maintained on 100% O₂,0.5% Isoflurane, Injection Vecuronium 1mg I/V and Injection Fentanyl 2microgram /kg/hour .The pulmonary cyst was excised first and then the hepatic cyst was excised by unclamping the DLT and maintaining ventilation of both the lungs. Throughout the surgery EtCO₂ and SpO₂ monitoring was done .Throughout the surgery the O₂ saturation, EtCO₂ remained within normal limits. Blood loss was adequately replaced. After the surgery was over the DLT was replaced with 7mm ID portex ETT and the patient was shifted electively to the ventilator.



Fig 1: Showing Hydatid Cyst Lung with Bronchopleural Fistula and Hepatic Hydatid Cyst

DISCUSSION

Hydatid cyst or *Echinococcus* in humans is caused by the larval stage of *Echinococcus Granulosus*, *E multilocularis* or *E vogeli*. Dogs are the definitive hosts and they pass the eggs in their faeces. After the humans ingest the eggs, the embryos escape from the eggs, penetrate the intestinal mucosa, enter the portal circulation and are carried to various organs, mostly liver and lungs. Larvae develop into fluid filled unilocular cysts. The cyst expands slowly over a period of years and usually remain asymptomatic until their expanding size elicits symptoms due to mass effect. Lung and liver are the most common sites of these cysts. The cyst that is frequently seen in the liver and lungs consist of a cavity filled with clear fluid and small secondary daughter cysts [3]. Hepatic hydatid disease may manifest clinically as abdominal pain or a palpable mass in the right upper quadrant. Pulmonary hydatid cyst may rupture into the bronchial tree or pleural cavity and produce cough, chest pain or haemoptysis [4]. Rupture of the hydatid cyst may produce fever, pruritus, urticarial rash, eosinophilia or anaphylaxis. Surgery has traditionally been the principle definitive method of treatment but it involves risk of leakage of fluid leading to anaphylaxis and dissemination of

infectious scolices. The latter complication has been minimized by the instillation of scoliocidal solutions like hypertonic saline or ethanol which may cause hypernatremia, intoxication or sclerosing cholangitis. Percutaneous aspiration, infusion of scolicidal agents and aspiration can be used instead of surgery in most of the cases. Medical treatment with Albendazole for 12 weeks to 6 months results in cure in 30% of the patients.

Anaesthetic implications of management of a case of hydatid cyst of the lungs include the problems associated with One Lung Ventilation (OLV) and with the cyst rupture and dissemination. The main objective of surgical techniques is resection of the intact or the complicated cyst while preserving as much lung as possible. Bronchi opening into the pericyst cavity allow for the discharge of the hydatid liquid. Operative manipulations can force fragments of laminated membrane or small daughter cysts into the bronchial tree resulting in acute obstruction of the airways. Such complications can be avoided by the use of OLV. The perioperative and postoperative complications depend on intactness of the cyst [5]. Uncontrolled spillage of cyst contents may cause secondary pleural or

bronchogenic hydatidosis. This complication is also prevented by OLV. Intentional collapse of the lung on the operative side facilitates most thoracic procedures. The most frequent complication of OLV is hypoxemia which is due to ventilation perfusion mismatch resulting from the combination of position, OLV and lung disease. Also the DLT can be malpositioned. Difficulties resulting from improperly positioned endobronchial tubes include failure to collapse the operative lung, difficulty in ventilating one or both the lungs, air entry into the wrong lung and air trapping and unsatisfactory deflation of the lung. Fiberoptic bronchoscopy can significantly reduce such malpositioning. Tracheobronchial trauma and haemorrhage are other complications.

The other main complication is anaphylactic reaction which occurs most commonly due to spillage of the cyst contents. The estimated incidences of this complication varies between 1 in 5000 to 1 in 20000 [6]. The symptoms vary from mild urticaria to anaphylactic shock [7]. Under anaesthesia cardiovascular signs like hypotension, tachycardia and arrhythmias occur predominantly. Bronchospasm is rare, whereas cutaneous symptoms like rash, flushing and urticaria occur more commonly on the neck, face and anterior chest. However the diagnosis of anaphylaxis should be confirmed by various immunofluorescence reactions and immunoelectrophoresis haemagglutination[8]. The treatment of anaphylaxis includes massive fluid resuscitation, vasopressors and corticosteroids. Epinephrine is the first line of treatment perioperatively [9].

CONCLUSION

We conclude that the management of a case of hydatid cyst of the lungs includes thorough understanding of the principles of respiratory physiology of the OLV and proper positioning of the double lumen tube and continuous monitoring of the saturation, ventilation and blood gases to prevent the associated complications.

REFERENCES

1. Pump KK. Echinococcosis (Hydatid Disease): Review and Report of a Case of Secondary Echinococcosis. Canadian Medical Association journal. 1963 Jul 13; 89(2):73.
2. Kir A, Baran E. Simultaneous operation for hydatid cyst of right lung and liver. The Thoracic and cardiovascular surgeon. 1995 Feb; 43(01):62-4.
3. Schantz PM, Okelo GBA: Echinococcus Hydatidosis, Tropical and Geographical Medicine. Edited by Warren KS, Mahmoud AAF. new York, Mcgraw Hill,1990: 505-518.
4. Clinton White, Jr Peter F. Weller Cestodes: Echinococcosis; In Harrison's Principles of Internal Medicine. 15th ed. USA: Mcgraw Hill ;2001: 1250-51.
5. Rabhandl W, Turnbull J, Felberbauer FX, Tasci E, Puig S, Vauer H. Pulmonary echinococcosis (hydatidosis) in children: results of surgical treatment. *Pediatr Pulmono*, 1999; 27(5): 336-40.
6. Goel MC, Agarwal MR, Misra A. Percutaneous drainage of renal hydatid cyst: early Results and follow-up. *British journal of urology*. 1995 Jun 1; 75(6):724-8.
7. Vuitton DA. Echinococcosis and allergy. *Clin Rev Allergy Immunol* 2004; 26:93-104.
8. Simons FE, Arduso LR, Bilò MB, El-Gamal YM, Ledford DK, Ring J, Sanchez-Borges M, Senna GE, Sheikh A, Thong BY. World allergy organization guidelines for the assessment and management of anaphylaxis. *World Allergy Organization Journal*. 2011 Feb 23;4(2):13.
9. Longrois D, Lejus C, Constant I, Bruyere M, Mertes PM. Treatment of hypersensitivity reactions and anaphylactic shock occurring during anaesthesia. In *Annales francaises d'anesthesie et de reanimation* 2011 Mar (Vol. 30, No. 3, p. 312).