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ANAESTHETIC MANAGEMENT OF PATIENTS WITH PULMONARY HYDATID CYST

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Abstract

Hydatid cyst is a disease produced by the encysted Larvae of echinococcal worms. Echinococcus granuloses is endemic in areas of the Mediterranean coast and middle east, Surgical intervention to remove the cyst that is commonly seen in liver and lung is the primary treatment for hydated disease .

Sixty- three patients underwent lateral thoracotomy for pulmonary hydatd cyst in the last 4 years at Basra Teaching Hospital. Special anesthetic technique was set for them including omission of premedication drugs , rapid sequence indication, preference of single lumen endotracheal tube than double lumen endobronchial tube, nitrous oxide gas exclusion from maintenance of anesthesia, ready stand–by good suction machine, manual low pressure ventilation, and careful monitoring .

Nine out of 24 cases with double lumen endobronchial tube showed severe hypoxia intraoperatively that demand urgent change of this type of tubes to signal lumen endotracheal tube. Patient with endotracheal tube had smooth intraoperative environment and no postoperative complications.

It is concluded that using this anesthetic regimen from the start of operation for these particular cases makes anesthesia management more easy and safe.

Introduction

Hydatid cyst is the larval stage of canine tapeworm Echinococcus granulosus, it is commonly found in the Middle East. The cyst that is frequently seen in the liver and lungs consist of a cavity filled with clear fluid and small secondary daughter cysts [1,2].

Conventional anaesthesia for cases with pulmonary hydatidosis may carry some risk to these patients whether it is a simple cyst or more seriously a complicated cyst, such as preoperative ruptured cyst to a bronchus which is some times infected or cysts communicating to the biliary tree, patients may come to the operating theatre with continuous coughing of hydatid fluid or germinal layer of the cyst or pus from infected cyst, or blood and bile in rare cases .

This situation necessitates modification in each step of anaesthesia, as the patient should be fully alert prior to surgery so no premedication was given. Inducation of anaesthesia was changed to what is called rapid-sequence induction so we can quickly

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do intubation and early suction of the material inside the trachea[3] . The type of endotracheal tube used can affect the ventilation and clearing of the material trachea and bronchi. No nitrous oxide gas was used as this gas have the ability to penetrate cavities and can inflate the cyst and rupture it[4] , it also prevent 100% oxygenation which is favored in such cases. Artificial ventilation was also changed to manual for better control of bronchial pressure .

This study aimed to evaluate the standard method of anaesthesia in managing lung cyst and to find the best way in administering anaesthesia for these patients .

Patients And Methods

Sixty three patients underwent thoracotomy for hydatid cyst in the lung were operated upon in the last 4 years at Basrah Teaching Hospital. They were 14 female 49 male with age range 19-54 year and weight range 43-83 Kg as shown in table I.

Patients presented mostly as simple lung hydatid cyst in one side of the chest (45 patient), sixteen patients came with ruptured hydatid cyst and they keep on coughing hydatid fluid or material or even pus in cases with infected cyst, two unusual cases came with coughing bile mixed sputum as they have lung hydatid cyst communicating with a liver hydatid cyst through the diaphragm as demonstrated in table II.

In the theatre no premedication was given and no priming dose of muscle relaxant to keep the muscle power and alertness till endotracheal intubation is accomplished. Preoxygenation for five minutes with head up position was set. Rapid-sequence induction using sodium thiopentone 3-5mg/kg followed immediately by succinyl-choline 1mg/kg, rapid endotracheal intubation was attempted in the following minute. Intubation was either using endotracheal tube in cases with ruptured hydatid or those with broncho-biliary fistula and in 21 case of simple cyst. Robertshaw double lumen endobronchial tube was used only for 24 cases of simple hydatid cyst. Maintenance of anaesthesia was achieved using 100% oxygen with halothane varying concentration and pancuronium bromide muscle relaxation. Suction through the tube was performed according to need, pulse oximeter probe was put from the beginning and monitoring was performed throughout the operation. Once the trachea is clean and oximeter result was good then patient was put in the lateral position for thoracotomy but still a new gush of fluid or material was always expected and so suction was done.

Results

Patients with simple uncomplicated hydatid cyst were intubated with single lumen endotracheal tube in 21 case and with double lumen endobronchial tube in 24 cases.

Nine out of the twenty four cases were changed intraoperatively from double lumen to single lumen as shown in table III, This because of feeling of high pressure in the ventilating system due to rupture of the cyst to a bronchus or during change of position from supine to lateral and so opening facing the beginning of the bronchus may change. Those nine cases had a significant decrease in Spo_2 in the following five minutes as shown in table IV that necessitated this change .

The operating conditions in those with ruptured cyst or bronchobiliary fistula was good till the end of the operation in regard to pulse rate and oxygen saturation .

no morbidity or mortality was recorded in any of the patients .

Discussion

Lung is the second most common organ affected by the hydatid disease after the liver[5]. Special anaesthetic precautions should be performed in management of this condition. In controversy with rakic et al[6,] This study showed that using double lumen endobrounchial tube specially in cases with ruptured, infected or communicated cyst makes more harm than good as the caliber of the opening is not enough to get the endocyst parts or small daughter cyst by suction and for any reason if the other lung is not well ventilated either by malposition or secretion so there will be hypoxia (Spo_2 86.3±1.7) that urges the quick change of the double lumen endobronchial tube to a wide bore single lumen endotracheal tube.

The change of double lumen to single lumen tube during surgery (9 cases , 37.5%) with the patient in the lateral position carry a high risk of hypoxia and contamination of the other lung, so if from the start we use the single lumen endotracheal tube for all cases of hydatid cyst in the lung we can eliminate this risk.

Rapid-sequence induction can reduce the time of intubation which is important to prevent soiling of the other lung with hydatid fluid or bile in rare cases.

Manual pressure ventilation was preferred for better feeling of material present in the tube or trachea and also is of help to synchronize with the surgeon during removal of the cyst as many times the surgeon needs temporary stopping of ventilation for suturing or he need a blow of gas to check for any open bronchi into the cyst cavity. High pressure ventilation should be avoided because of serious risk of cyst rupture[7].

In conclusion; cases of pulmonary hydatid cyst should be managed carefully to prevent the jeopardy to life[8]. The lines of anaesthetic management are; omission of premedication drugs, rapid sequence induction, preference of single lumen endotracheal tube than double lumen endotracheal tube, nitrous oxide gas exclusion from maintenance of anaesthesia, ready stand-by good suction machine, manual low pressure ventilation, and careful monitoring.

Table 1 ;Characteristics of the patients.

	Age (year)	Weight(kg)	Gender
Mean	30.6	64.4	14 female
±SD	13.7	10.8	49 male
Range	19-54	43-83	
Total			63

Table II : presentation of the patients.

Type***of*** presentation	Number
Simple cyst	45
Rupture cyst	16
Broncho-biliary fistula	2
Total	63

Table III: Intubation pattern in patients with simple cyst .

Type***of***intubation	Number
Single lumen endotracheal tube	21
Double lumen endobronchial tube	15
Double lumen changed to single	9
Total	45

Table IV : Oximetry results in patients who had double lumen endobronchial tube and continued with it (15cases), and those who was changed to single lumen (9 cases).

Base line	induction	intubation	5 min. (15 case)	5 min. (9 cases)	
Pulse rate					
Mean	95.3	114.6	119	101	*121
±Sd	14.3	19.2	18.3	16.4	18.3
Oxygen saturation					
Mean Spo_2	97.3	97.1	96.7	98.8	*86.3
±SD	1.5	1.4	0.3	2	1.7

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