ORIGINAL RESEARCH PAPER

Anaesthesiology

KEY WORDS: Multiple splenic abscesses, pigtail catheter, Hydropneumothorax, TCI pump, Epidural anaesthesia and postop analgesia.

ANAESTHETIC MANAGEMENT OF A CASE OF MULTIPLE SPLENIC ABSCESSES WITH LEFT HYDROPNEUMOTHORAX UNDERGOING SPLENECTOMY WITH PIGTAIL CATHETER INSITU.

Dr. Rohit Kamal

Dr. Ashok Kumar Balasubramanian

Dr. Lakshmi R

INTRODUCTION:

The use of a thoracostomy chest tube for drainage of hydropneumothorax is preferred from an anaesthetic point of view as positive pressure can be applied. Nowadays, pigtail catheters are widely used as it is less invasive, less traumatic, reduces ambulatory limitation and is easier to perform. When compared to the chest thoracostomy tube, pig tail catheters are better tolerated by patients. Here we present a case of a 43 year old man with multiple splenic abscesses in sepsis and left sided hydropneumothorax which was drained with a pigtail catheter. The plan initially was to perform the procedure under high thoracic epidural with ICD on standby. Half an hour into the procedure, due to incessant cough and movement, there was a need to supplement with general anaesthesia using a supraglottic airway (Proseal LMA size 3).The patient was on spontaneous ventilation with Propofol sedation using TCI pump. Procedure was conducted without further complications. Patient was shifted to SICU for further care.

Case Report:

A 43-year-old male came with complaints of pain over the left abdomen, left sided chest pain and breathlessness for 4 days associatied with low grade fever. Patient also complained of cough with expectoration for the same duration. He had a weight-loss of 15kgs over a period of one and a half years. Patient is a known diabetic for the past 10 years under treatment and a known hypertensive not under treatment. Patient is a chronic smoker and a chronic alcoholic both for the past 15 years.

On examination, the patient was conscious and co-operative with tachycardia and a high blood pressure (pulse rate = 114 beats/min, BP = 150/90 mmHg). Respiratory rate was 27 breaths per minute and oxygen saturation was 93% on room air. On auscultation of lungs, air entry was reduced on the left side of the chest. Cardiovascular system examination normal. On examination of the abdomen, tenderness was elicited on the left hypochondrium. Splenomegaly present. Lab investigations.WBC counts at 7988. Hemoglobin - 14.2. Urea 28/Creatinine- 0.5/Sodium- 140/ Potassium-4.ECG was normal. ECHO normal.

Chest radiograph of the patient showed left sided pleural effusion. Arterial blood gas (ABG) values on room air were within normal limits (pH = 7.45, PCO2 = 28.1, PO2 = 90, = 26.8). Ultrasound showed multiple splenic abscesses along with a moderate left sided pleural effusion. Computed tomography of abdomen showed multiple splenic abscesses scattered diffusely of which the largest measured 17x10mm in the inferior pole. A well defined collection of 30ml noted in the supero anterior aspect of the spleen. Moderate left pleural effusion was seen in the left lung most likely reactive to splenic abscess. Liver enlarged measuring 18cms.

Patient was shifted to the ICU in view of breathlessness and desaturation. ABG-pH-7.465/pCO2-28.9/pO2-64.4/HCO3-20.6/lac-0.9

He was started on antibiotics (Inj piptaz and inj metronidazole) and under analgesic cover. Urine culture showed no growth. Blood culture showed Staphylococcus hominis growth sensitive to Gentamicin/ Clindamycin/ Penicillin/ Teicoplanin/ Trimethoprim/Vancomycin) Inj Clindamycin 600mg was added following this.

Following improvement, he was shifted to the ward from ICU after two days. Pleural tapping was done following which patient developed left sided iatrogenic hydropneumothorax. This was confirmed on the chest radiography. Fluid analysis showed ADA- 19.45 U/L, LDH value of 140 U/L, Glucose- 105 mg/dl, Total protein- 5.7g/dl implying a transudate effusion. Pleural fluid showed negative for AFB. Total count was seen to be around 9790 (from 7988). Other investigations were found to be normal.

Following the development of the hydropneumothorax, a 16 French pigtail catheter (Dawson-Mueller Drainage Catheters) was inserted prior to the day of surgery. Chest X-ray showed improvement of the left lung hydropneumothorax. There was an increase in the total leucocyte count to 12560/mm3.

Fig 1.: Hydropneumothorax

Fig 2. Post Pigtail Catheter insertion

Pre-op evaluation-

- Relevant detailed history noted. On examination, patient was conscious, oriented. Vitals- BP 141/74 mmHg, PR-92/min with saturation of 93% on room air. On systemic examination, Cardiovascular system normal. On auscultation of respiratory system, there were decreased breath sounds on the left side with crepitations.
- Airway was assessed, mouth opening was normal, MMP-2, Thyromental distance was normal with a normal neck extension. Urine input/output was normal.
- Routine investigations were within normal limits except for rise in WBC since admission to 16800 (from 7988 per cubic mm). Two days before surgery the COVID- 19 RTPCR test done was negativeECHO showed an Ejection fraction of 64%, normal left ventricular systolic function, Grade 1 left ventricular diastolic dysfunction with no valvular abnormalities, no RWMA.
- Chest x ray showed left sided hydropneumothorax.
- The preoperative ABG was within normal limits (pH-7.431/pCO2-32.1/pO2-137/SPO2/HCO3-21/lac-0.7).
- Cardiologist and pulmonologist opinion was obtained. Patient was planned for splenectomy with epidural anaesthesia. The patient was taken under ASA 3 risk classification.

Intra-op:

- Informed consent was obtained from the patient on the preoperative day. The sequence of events in the theatre was explained. Immediately after putting the patient on operation table, non invasive blood pressure monitoring, temperature probe, continuous ECG and pulseoximeter were attached. IV line was secured. T11-T12 interspinous space was identified with patient on sitting position
- Skin and subcutaneous tissue was infiltrated with 3ml of 2% lignocaine plain. Epidural space was identified by loss of resistance technique using 18G Tuhoy needle. Once epidural space was identified 20 G catheter was advanced into the epidural space through 18 G epidural needle, the needle was removed and catheter fixed at 12 cm (8 cm in epidural space) on the back of the patient. After a negative aspiration for blood or CSF, 4ml of 2% lignocaine with 1 in 200000 dilution adrenaline was used as test dose. The patient was made supine. Through epidural catheter, 4ml of 0.5% Bupivacaine and 8 ml of 2% lignocaine with adrenaline was given. Level of sensory analgesia was measured and found to be adequate for the procedure.
- The patient's HR was 82/min,temperature was 98°F, BP of 123/82 and SpO2 100%. Patient was put on face mask with O2 at 4L/min flow. Level of sensory analgesia was measured by using cotton dipped with spirit.
- Maximum dermatomal level achieved at 10 minutes. 4ml of 0.25% Bupivacaine and 8 ml of lignocaine with adrenaline was given. HR was 86/min,temperature was 98°F, BP of 113/67 and SpO2 100%. Half an hour into the surgery, patient complained of cough and the surgeons were not comfortable.
- Patient was induced using Inj. propofol 100mg and inj. Fentanyl 100mics and left on spontaneous ventilation using a supraglottic airway device (Proseal LMA size 3) with O2:N2O- 2:2, Inhalational agent sevoflurane at 1.5.
- Patient had a bp of 110/80 mmHg with a heart rate 88/min and SPO2 of 100%.
- Propofol infusion started through a TCI pump at the rate of 6ml/hr. It was stopped after spleen removal. 6ml of 0.25% injection bupivacaine was given.
- Epidural infusion of 0.125% Inj. Bupivacaine was started. Intraop, fluid input blood loss 350 ml, urine output 200 ml. Otherwise uneventful. Patient extubated after satisfying the criteria and shifted to the PACU for post op care.
- Patient vitals were stable with a bp of 140/80mmHg, heart rate of 99/min and an SPO2 of 99% with 4L O2. Patient shifted to PACU room for post op observation. After two hours, patient was shifted to ICU for vigilant monitoring. In the ICU, epidural infusion of 0.125% Bupivacaine at 5ml/hr was continued.
- Patient was under antibiotic cover of Inj. Piptaz 4.5gm given thrice a day and inj. Clindamycin 600mg given twice a day along with analgesic cover of Paracetamol infusion given only when in pain. Patient was pain-free owing to the epidural. ABG-pH-7.396/pCO2-32.4/pO2-147/HCO3-22.4/lac-2

Post-op:

- Patient was shifted to ward after one day. Chest physiotherapy was started. Oral nutrition started on POD 2. Further course in the hospital was uneventful. Patient was discharged after a stay of 7 days in the hospital.

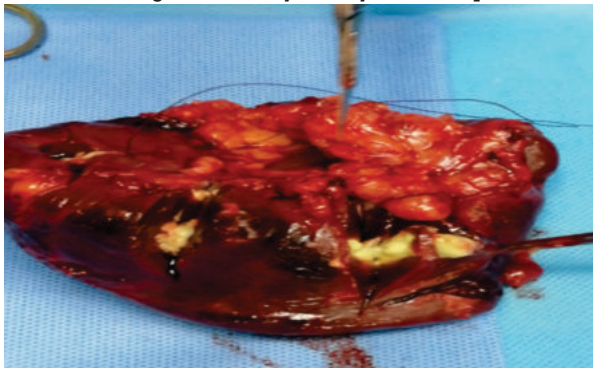


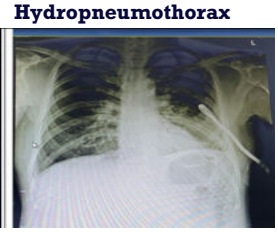
Fig 3.: Specimen

DAY 1		ICU		PRE-OP		POST-OP	
pH	7.465	pH	7.437	pH	7.431	pH	7.396
pCO2	26.9	pCO2	29.1	pCO2	32	pCO2	32.4
pO2	64.4	pO2	66.1	pO2	107	pO2	147
HCO3	20.6	HCO3	19.3	HCO3	21	HCO3	19.4
Lac	0.9	Lac	0.8	Lac	0.7	Lac	2
SpO2	93%	SpO2 on 4LO2	96%	SpO2	97%	SpO2	96%

Admission

Hydropneumothorax

Post pigtail insertion



Post op

DISCUSSION:

- Use of small-bore pigtail catheter is less invasive for draining pleural effusions than chest tube thoracostomy.
- Placement of a large-bore chest tube is an invasive procedure with potential Morbidity. Hence, the use of small-bore pigtail catheter may be desirable.The use of small-bore catheters for pleural effusion drainage is based on the idea that it may be a less invasive procedure and thus better tolerated by patients compared to standard large-bore chest tubes.
- On reviewing the literatures, pigtail catheter insertion was usually safe with little chance for complications. It is observed that 5% of pigtail catheter placements were associated with serious complications (hemothorax, pneumothorax, and hepatic perforation) and the overall complications of catheter use occurred in 20% of patients and included failure to drain, dislodgement, kinking, empyema, and disconnection.
- The use of a small indwelling pleural catheter was more cost-effective when used in place of a closed tube thoracostomy for drainage of large-volume pleural effusions. Pain caused by chest drain insertion is less with using pigtail catheters as they do not impinge on the neurovascular bundle or alter the geometry of the intercostal space. In contrast, chest tubes, with their excessive size, cause pain by compressing the neurovascular bundle at the top of the intercostal space as well as by levering open the intercostal space

CONCLUSION:

Anesthesiologist should be aware of the extensive use of pigtail catheters over ICD for draining pleural effusion. It is less expensive, easy to place and allows the patient to ambulate. While planning General Anaesthesia with controlled ventilation, the pigtail catheter should be replaced with ICD to prevent the occurrence of tension pneumothorax

Funding:

None.

REFERENCES:

1) Gammie JS, et al. The Pigtail Catheter for Pleural Drainage: A Less Invasive Alternative to Tube Thoracostomy,; JSLS (1999)3:57-61
2) Chien-Heng, et al. Comparison of Pigtail Catheter With Chest Tube for drainage of Parapneumonic Effusion in Children; Pediatrics and Neonatology (2011) 52, 337-341.
3) Gonces DJ, Tarver RD, Gray WC, Pearcy EA et al. Treatment of pneumothoraces utilizing small caliber chest tubes. Chest. 1988;94:55-57.
4) Miller KS, Sahn SA et al. Chest tubes: indications, techniques, management and complications. Chest. 1987;91:258-263.
5) Munnell ER et al. Thoracic drainage. Ann Thome Surg. 1997;63:1497-1502