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Case Report

Anaesthetic management of a case of multiple splenic abscesses with left hydropneumothorax undergoing splenectomy with pigtail catheter insiitu

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ABSTRACT

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. Pigtail catheters are widely used as it is less invasive, less traumatic, and easier to perform and allows more ambulation. When compared to the chest thoracostomy tube, pig tail catheters are better tolerated. 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.

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1. 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 duration. He also complained of low grade fever and cough with expectoration for the same duration. He had a weight-loss of 15kgs over a period of one and a half years. He is a known diabetic and hypertensive for the past 10 years. Patient is a chronic smoker and alcoholic for the past 15 years. On examination at admission, the patient was conscious and co-operative with tachycardia and a high blood pressure (BP = 150/90 mmHg, Pulse rate = 114 beats/min). Respiratory rate was 27 breaths per minute and oxygen saturation 93% on room air. On auscultation of lungs, air entry was reduced on the left side of the chest with crepitations. Cardiovascular system examination was normal. On examination of the abdomen,

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tenderness was elicited on the left hypochondrium and enlarged spleen was found on palpation. Lab investigations showed WBC count of 7988 per cubic mm and hemoglobin 14.2gm%. The serum electrolytes, coagulation profile, RFT and LFT were within normal limits. ECG was normal. ECHO revealed normal study. Chest radiograph of the patient showed left sided pleural effusion. Arterial blood gas (ABG) analysis on admission at room air was within normal limits Patient was shifted to the ICU in view of breathlessness and desaturation in the ward. The ABG taken at that time was normal. He was empirically started on antibiotics. The Urine for routine examination was normal and the culture did not show any growth. Blood culture showed Staphylococcus Hominis growth. Inj Clindamycin sensitive to growth was added. 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. The Pleural 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 was negative for AFB. On second day at hospital his WBC count increased to 9790 from 7988 per cubic mm. Following the development of the left hydropneumothorax, a 16 French pigtail catheter catheter (Dawson-Mueller Drainage Catheters) was inserted prior to the day of surgery rather than an ICD. Chest x ray showed drainage of left hydropneumothorax and expansion of lungs. The total leukocyte count increased to 12560/mm3. 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 superior anterior aspect of the spleen. Moderate left pleural effusion was seen in the left lung most likely reactive to splenic abscess. Liver was enlarged measuring 18cms. The patient was posted for splenectomy. During preop evaluation a detailed history and general examination was done. Airway was assessed, and found to be adequate. The cardiovascular system on examination was normal. On auscultation of respiratory system, there were decreased breath sounds on the left side with crepitations. 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 negative. Chest x ray showed left sided hydropneumothorax with pig tail in situ. 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.

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. The patient's HR, temperature, BP

and SpO_2 were monitored. Level of sensory analgesia was measured and found to be adequate for the procedure.

The procedure was carried out with epidural block on spontaneous ventilation with pig tail in situ on left hemithorax. Half an hour into the surgery, patient complained of cough and discomfort. Patient was given Inj. Glycopyrolate0.02 mg, Inj. Midalzolam 0.2 mg,Inj. IV Fenatany(100 mic), followed by insertion of a supraglottic airway device (Proseal LMA size 3) with IV Propofol (100 mg). The patient was maintained on spontaneous ventilation with O₂/N₂O (50% each) and inhalational agent sevoflurane at 1 volume %. Patient's vitals were within normal limit throughout the procedure. A Target controlled Infusion (TCI) of propofol was started at the concentration of 0.3 mic/ml at the biophase. It was stopped after spleen removal. Epidural infusion of 0.125% Inj. Bupivacaine was started 40 minutes after start of the procedure at 4 ml per hour for analgesic purpose. The total introperative crystalloid infused was 1.5 L. The total blood loss during the procedure was about 350 ml. The urine output during intraoperative period was 200ml. The intraoperative period was uneventful. Patient extubated after satisfying the extubation 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 by facial mask. After two hours, patient was shifted to SICU for vigilant monitoring. In the ICU, epidural infusion of 0.125% Bupivacaine at 5ml/hr was continued. Patient was under antibiotic cover of Inj.^{1–3} Piptaz 4.5gm given thrice a day and inj. Clindamycin 600mg given twice a day along with analgesic cover of Inj Paracetamol 1 gm given as and when needed on the basis of pain complaint of patient, to cover the break through pain. Post operative ABG was normal.



Fig. 1: Xray chest at admission



Fig. 2: Xray chest with left hydro pneumothorax



Fig. 4: Post op Xray chest with pig tail in situ



Fig. 3: Xray chest post post pigtail insertion showing left lung expansion



Fig. 5: Postop

Table 1: ABG at admission, preoperatively when in ICU, immediate preop and immediate post op.

ABG	Day 1	ICU	Pre-OP	Post OP
PH	7.46	7.43	7.43	7.39
PCO2 mm Hg	26.9	29.1	32	32.4
P02 mm Hg	64.4	66.1	107	147
HCO3 Mmol/L	20.6	19.3	21	19.4
LACTATE Mmol/L	0.9	0.8	0.7	2
SPO2 %	93%	96 %(41pm by mask)	97%	96%



Fig. 6: Specimen



Fig. 7: Comparing ICD and Pigtail diamters⁴





2. Discussion

Pigtail catheter insertion is an effective and safe method of draining pleural fluid. We encourage its use for all cases of pleural effusion requiring chest drain except for empyema and other loculated pleural effusions.⁴ Placement of a largebore chest tube is an invasive procedure with potential complications. Use of small-bore pigtail catheter is a less invasive, cost effective way for draining pleural effusions than chest tube thoracostomy. This is a case of multiple splenic abscesses with sepsis planned for splenectomy. He had a left sided hydropneumothorax drained with pigtail catheter in-situ. His pre-op Chest X-ray and ABG were found to be within normal limits. The lung expansion was adequate on both sides. Hence, the procedure was carried out under epidural block. The level of sensory block achieved was T4, sufficient enough to do the procedure intended. The patient was on spontaneous ventilation. If there is need for GA supplementation, the pigtail catheter has to be replaced with an ICD to prevent tension pneumothorax which can cause compression of great vessels and thereby resulting in hemodynamic instability. Inspite of its popularity, the pigtail catheter has five percent serious complications (hemothorax, pnuemothorax, and hepatic perforation) and the overall complications of catheter use occurred in 20% of patients (failure to drain,

dislodgement, kinking, empyema, and disconnection).⁵ 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 intercostals space.⁴ In contrast, chest tubes, with their excessive size, cause pain by compressing the neurovascular bundle at the top of the intercostals space as well as by levering Open the intercostals space.

3. Conclusion

Use of a pigtail catheter has increased over ICD as it is a less invasive procedure, easier to perform with less potential morbidity. 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.

4. Source of Funding

None.

5. Conflict of Interest

None.

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