

Life Threatening Iatrogenic Unilateral Pleural Effusion: An Uncommon Complication of CVP Line Placement

Dr. Rajnish Kumar¹, Dr. Priyanka²

¹M.D (Internal Medicine), Department of Internal Medicine, Consultant Physician, Suryadeep Hospital, Sector - 46 , Gurugram

²M.S (Ophthalmology), Department of Ophthalmology consultant Ophthalmologist, Suryadeep Hospital, Sector - 46, Gurugram

Abstract: *Pleural effusions are commonly encountered in both out patients deptt. and in patient deptt. Analysis of the relevant clinical history, physical examination, chest radiography and diagnostic thoracentesis is useful in identifying the cause of pleural effusion in majority of the cases [1]. In few cases, the aetiology may be unclear after the initial assessment. The list of diseases that may account for a pleural effusion is long[2]. We present an interesting case of iatrogenic pleural effusion that was encountered in our hospital secondary to central line placement.*

Keywords: iatrogenic pleural effusion, CVP line, A.D.E.M, displacement

1. Key Messages

- Iatrogenic pleural effusion is a known complication of CVP line insertion.
- In case of unstable hemodynamics following CVP line insertion, iatrogenic pleural effusion must be ruled out.
- Early aggressive management of iatrogenic massive pleural effusion must be attempted in all cases

2. Introduction

Iatrogenic pleural effusion is a condition in which patient develops pleural effusion (i.e.: excess fluid that accumulates between the two pleural layers) unilateral or bilateral as a consequence of physicians intervention. Depending on amount its manifestation varies, it may not manifest till it become massive, compromising the patient's haemodynamics, especially if patient is on mechanical support. Early aggressive management of iatrogenic massive pleural effusion must be attempted in all cases.

3. Case History

A 28 year old male patient, referred from outside hospital as a diagnosed case of post viral acute disseminated encephalomyelitis (ADEM) involving C3-7 spinal cord segments with respiratory failure intubated on mechanical support. After admission patient was shifted to ICU for further management. Next day of ICU admission in view of frequent requirement for intravenous access for blood sampling and various purposes central venous pressure (CVP) line insertion was planned. After ruling out absolute and relative contraindications, a triple lumen CVP line was put in right subclavian vein under all aseptic precautions. First it was confirmed by aspiration of venous blood (confirmed by blood gas analysis) from all three ports; then it was reconfirmed with chest x-ray (CXR) in which the tip of the CVP line was lying in 2nd I.C space on right side. On the first day, different fluid and drug infusions were given as ordered. On second day of CVP insertion, while icu

monitoring it was observed that patient's haemodynamical parameters started deteriorating. He developed falling blood pressure with tachycardia. Patient was given intravenous fluids followed by inotropic support. In spite of these efforts, the patient's blood pressure continued to fall. Hence a second clinical review was done. On chest examination right side chest was dull with respect to the left side and air entry was found to be absent on the right side. Inward displacement of endo-tracheal tube was ruled out. An iatrogenic pleural effusion was suspected and all infusions were stopped via CVP line. Aspiration from all the three ports was attempted to confirm the location of CVP in the vein, however, clear fluid was aspirated from the most distal port and blood was aspirated from the other two ports. Later on repeat chest X-ray, right hemi-thorax homogenous opacification was noticed (Figure 1) suggestive of pleural effusion, which was not present in CXR before placement of CVP line. A pleural tap was done on right side and sent for lab analysis. Tapped pleural fluid was found to be transudative in nature with protein of 0.3g/dl and glucose 882mg/dl.

Therefore it was formulated that the distal port of the CVP line was probably displaced while providing nursing care to the patient; due to its poor fixing on skin. So right side pleural drainage was planned and a chest tube of 28G was put under aseptic precautions and guarded pleural fluid drainage was done under monitoring.

Total twenty-four hour drainage was found to be more than 4 liters. Patient's haemodynamics improved significantly while and after pleural fluid drainage. Meanwhile cvp line was removed from rt. side and another cvp line was put from left side under all aseptic precautions and checked accordingly. The chest tube was removed on the 3rd day of chest tube insertion as no fluid had drained for past 24 hour. The chest tube insertion site was sealed properly. Patient continued to receive medical management as required.

4. Discussion

This is a case of accidental displacement of CVP line (distal port) into the pleural cavity. Similar cases of iatrogenic pleural effusion have been reported earlier also[3,4,8] but this case is different because; here displacement of only one port of the CVP line was enough to endanger the life of the patient. Also, CVP line was placed correctly at the time of insertion but unfortunately one of its port came out of the vein into the pleural cavity possibly as a result of secondary re-positioning of CVP line.[5] Hence, all fluids given via the same mal-positioned port collected on same sided pleural cavity, leading to deterioration of the patient's condition. Catheter tip migration is a recognized phenomenon following central venous catheterization, occurring to some degree in approximately 17% of all per-cutaneously introduced catheters.[5] Poor position or aberrant location from catheter tip migration has been shown to occur in up to 6% of catheters.[6] Radioimaging is the gold standard for confirmation of the position of central venous catheter as well as its related complications. [7] Still pleural fluid evaluation must be done side by side for confirmation of diagnosis. This patient improved haemodynamically only after chest tube drainage of the iatrogenically collected pleural fluid.

References

- [1] Porcel JM. Pearls and myths in pleural fluid analysis. *Respirology* 2011; 16: 44–52.
- [2] Light RW. The undiagnosed pleural effusion. *Clin Chest Med* 2006; 27: 309–319.
- [3] Thomas CJ, Butler CS. Delayed pneumothorax and hydrothorax with central venous catheter migration. *Anaesthesia*. 1999;54:987–90.
- [4] Cieslinski G, Haak T, Klepzig H, Kaltenbach M. Iatrogenic origin of pleural effusion. A rare complication of the central venous catheter. *Fortschr Med*. 1992;110:415-6, 420.
- [5] Lang-Jensen T, Nielsen R, Sorensen MB, Jacobsen E. Primary and secondary displacement of central venous catheters. *Acta Anaesthesiol Scand*. 1980;24:216–8.
- [6] Vazquez RM, Brodski EG. Primary and secondary malposition of silicone central venous catheters. *Acta Anaesthesiol Scand. Suppl*. 1985;81:22–6.
- [7] Neha Hasija et.al. Massive hydrothorax with malpositioned central venous catheter – Ultrasound detection .*Egyptian Journal of Anaesthesia* (2016) 32, 229–231 .
- [8] Jayashree Patki. Hydrothorax: An uncommon complication of central venous catheterization. *Karnatak Anaesthesia Journal*. (2015) 1,3:161.