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A CASE REPORT ON HYDROPNEUMOTHORAX

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ABSTRACT

A Hydropneumothorax is indeed a serious and potentially life-threatening condition, as it involves the accumulation of both air (pneumothorax) and fluid (hydrothorax) in the pleural space. This situation often complicates the normal function of the lungs, as both the air and fluid can compress the lung tissue, making it difficult for the lung to fully expand, which can lead to impaired oxygen exchange. Hydropneumothorax can be managed with antibiotics, anticoagulants, intercostal drainage, and B12 supplements.

KEYWORDS: Hydropneumothorax, Pneumothorax, Hydrothorax, Pleural space, Lung compression.

INTRODUCTION

A hydropneumothorax is a rare radiologic outcome that consists of the concurrent presence of both free fluid and air within the pleural Space[1] The presence of both air and fluid in the pleural space is typically a result of trauma (such as a punctured lung), infections (like tuberculosis or pneumonia), or post-surgical complications. The combination of air and fluid within the pleural space can complicate treatment and may lead to respiratory distress, as the lung may be compressed by both the air and fluid.[2] It is a rare condition; however, it has been associated with a chest infection, malignancy, chest trauma and pleural procedures like thoracentesis. Pulmonary embolism is an occlusion along the pulmonary artery by an embolus.[3] The typical clinical presentation includes sudden onset of unilateral thoracic pain, cough, and dyspnea.[2] The reported incidence of pneumothorax is 18–28/100 000 cases per annum for males and 1.2–1.6/100,000 for females. Men are more likely than women to experience it, which may be because of variations in the risk factors due to smoking and other lifestyle factors.[4] The diagnosis

includes chest radiographs and CT scans showing spherical or oval masses with smooth outlines Even though there are several noninvasive diagnostic tests that are useful, only surgical excision and tissue biopsy can provide a conclusive diagnosis.[5] The prescribed treatment may include simple observation with supplemental oxygen, large-bore needle thoracentesis, intercostal drain (ICD) placement, or video assisted thoracoscopy (VATS)[4]

CASE PRESENTATION

A 39-year-old male patient presented to causality with the chief complaints of cough with expectoration in the last 20 days, breathlessness on exertion in the last 20 days and fever from 1 week and complaints of right sided chest pain in the last 1 week. Patient was apparently normal 20 days ago, then he developed cough which was insidious in onset and gradually progressive. Cough increased since10 days, more during night and expectoration was thick, white, scanty which was more during the day.

Breathlessness, which was insidious in onset, gradually progressive from Grade- I mMRC (Modified medical research council) progressed to Grade -II mMRC and fever which was insidious in onset. Low grade ON and OFF type which relieved on medication and right sided chest pain was sudden in onset and gradually progressive and had no history of weight loss, loss of appetite, or pain in abdomen, no history of hemoptysis or trauma and TB or asthma and no history of inhaler usage. As for above complaints patient was initially evaluated at a outside hospital and was symptomatically treated with analgesics and pain killers, but his symptoms are not relieved hence the patient got admitted in emergency ward under respiratory medicine. Initially patient was initiated with moist oxygen for 2 days and after right ICD insertion procedure was carried out and 100 ml of fluid was drained out and it was done on alternative days.

On physical examination patient was febrile, conscious, oriented and respiratory sounds were normal, but there was a decreased intensity in right ISA (Intrinsic sympathomimetic activity) and IAA (Intrerrupted aortic arch) and bilateral basal crept were present.

Laboratory investigations reported, a pleural fluid analysis where adenosine deaminase body fluid – 26.9 U/L, pleural fluid chloride – 100.5 mEq/l, pleural fluid glucose – 28.0 mg/dl, pleural fluid protein – 3.9 g/ dl, lactate dehydrogenase body fluid – 1782.0 U/l, MCV-108.9fl, MCH – 36.4 Pg, vitamin B12- 82 pg/ml, serum homocysteine – 31.4 µmol/l.

Investigative procedure as follows

A chest x-ray was performed after finding the patient with respiratory distress. Chest x ray showed a status of pulmonary embolism in right segmental arteries of lower lobe of the lung. CECT of Thorax was performed shows the pulmonary thromboembolism bilateral in main pulmonary artery segment and sub-segmental branches of right pulmonary artery.

USG of abdomen and pelvis scan showed that right minimal and left mild pleural effusion with adjacent lung atelectasis and mild splenomegaly.

2D Echo showed that moderate pulmonary arterial hypertension (PAH), WITH ejection fraction of 60%.

Therapeutic procedure

Right sided ICD insertion

Patient is positioned in supine position in 45degree angle and right infra-axillary area is cleaned and draped with betadine solution

Local anesthetic 2% lignocaine is given priorly before the procedure begins

Procedure steps

The incision site selected was 5th intercoastal space in the mid axillary line, skin incision was made using 23 scalpel blades, muscles were carefully split and 28F trocar with a chest tube was inserted into the pleural space, tube was connected to a Jackson-pratt drain bag, and 50ml of fluid/air was drained.

The tube was secured and connected to a underwater seal, and suction was applied as needed. The patient's chest tube column movement was patient, indicating proper function.

The patient is receiving a combination of medications to address multiple health concerns. Inj. Pipcube (piperacillin & tazobactam) 4.5g is administered three times a day (1-1-1) to treat bacterial infections, while Inj. Clindamycin 600 mg (1-1-1) serves as an additional antibiotic. To prevent gastrointestinal irritation, Inj. Helicorab 20 mg is given twice daily (1-0-1). For pain management, Inj. Tramadol 1 amp is administered once daily in the morning (1-0-0), and Inj. Emest is provided to manage symptoms of vomiting. The patient is also on intravenous fluids (IVF) with Normal Saline (NS) combined with Multivitamins (MVI) at 50 ml/hr to address nutritional deficiencies. At night, 10 ml of Syp. Dropizin (0-0-1) is given to treat cough. Nebulization with Duolin (1-1-1) is used to relax airway muscles and facilitate easier breathing. Inj. Clexane 60 mg is administered twice daily (1-0-1) for the treatment of pulmonary embolism. For fever, Tab. Dolo 650 mg is prescribed at night (0-0-1). Inj. Optineuron (1 amp, 0-1-0) and Inj. Thiamine 100 mg (1-0-0) are given to support and treat vitamin B12 deficiency.

DISCUSSION

This case study presents a 39-year-old male who developed bilateral pulmonary thromboembolism with an unusual underlying etiology. The patient's subacute presentation with progressive respiratory symptoms over 20 days, including worsening cough, dyspnea, fever, and chest pain, initially led to misdiagnosis and ineffective symptomatic treatment.

Comprehensive evaluation revealed definitive evidence of bilateral pulmonary thromboembolism on CECT thorax, accompanied by pleural effusion requiring drainage and moderate pulmonary hypertension on echocardiography. The most compelling aspect of this case was the identification of severe vitamin B12 deficiency (82 pg/ml) with consequent hyperhomocysteinemia (31.4 µmol/L) as the likely prothrombotic trigger - a relationship supported by the presence of macrocytosis on hematologic studies. Management

appropriately addressed both the acute thrombotic condition through anticoagulation with enoxaparin and the underlying metabolic derangement with vitamin B12 supplementation, alongside supportive measures including intercostal drainage, antibiotics, and symptomatic therapy.

This case highlights the importance of considering nutritional deficiencies as potential risk factors for thrombotic events, particularly in younger patients without traditional risk factors, and demonstrates the need for clinicians to maintain a high index of suspicion for atypical presentations of pulmonary embolism. Long-term management should include extended anticoagulation, continued vitamin B12 supplementation, investigation for the underlying cause of Vitamin B12 deficiency, and monitoring for resolution of pulmonary hypertension.

CONCLUSION

This case of bilateral pulmonary thromboembolism highlights the connection between nutritional deficiencies, specifically severe vitamin B12 deficiency, and thromboembolic disorders. The patient's respiratory symptoms were linked not only to extensive pulmonary embolism but also to hyperhomocysteinemia, a key prothrombotic factor. Despite the absence of traditional risk factors, these biochemical abnormalities played a central role in the condition. Management with anticoagulation, intercostal drainage, and B12 supplementation addressed both the acute event and the underlying deficiency.

This case emphasizes the importance of considering non-traditional risk factors and adopting a holistic approach to prevent recurrence and optimize patient outcomes.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

PATIENT CONSENT

The patient addressed in this case report has provided consent for publishing, acknowledging the report’s nature and understanding that their identity will be kept confidential.

ABBREVIATIONS

ICD- Inter Costal Drain, VATS- Video Assisted Thoracoscopy, Mmrc- Modified Medical Research Council, ISA- Intrinsic Sympathomimetic Activity, IAA -Intrerrupted Aortic Arch, PAH- Pulmonary Arterial Hypertension.

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