

# HYDROPNEUMOTHORAX AS THE INITIAL MANIFESTATION OF ADVANCED LUNG ADENOCARCINOMA

## LEARNING OBJECTIVES

- Recognize that hydropneumothorax is an emerging presentation of advanced lung adenocarcinoma
- Have a high suspicion for lung adenocarcinoma in older persons with smoking history presenting with hydropneumothorax

## CASE PRESENTATION

A 74-year-old woman presented to the emergency department with worsening left-sided chest pain and dyspnea for three weeks.

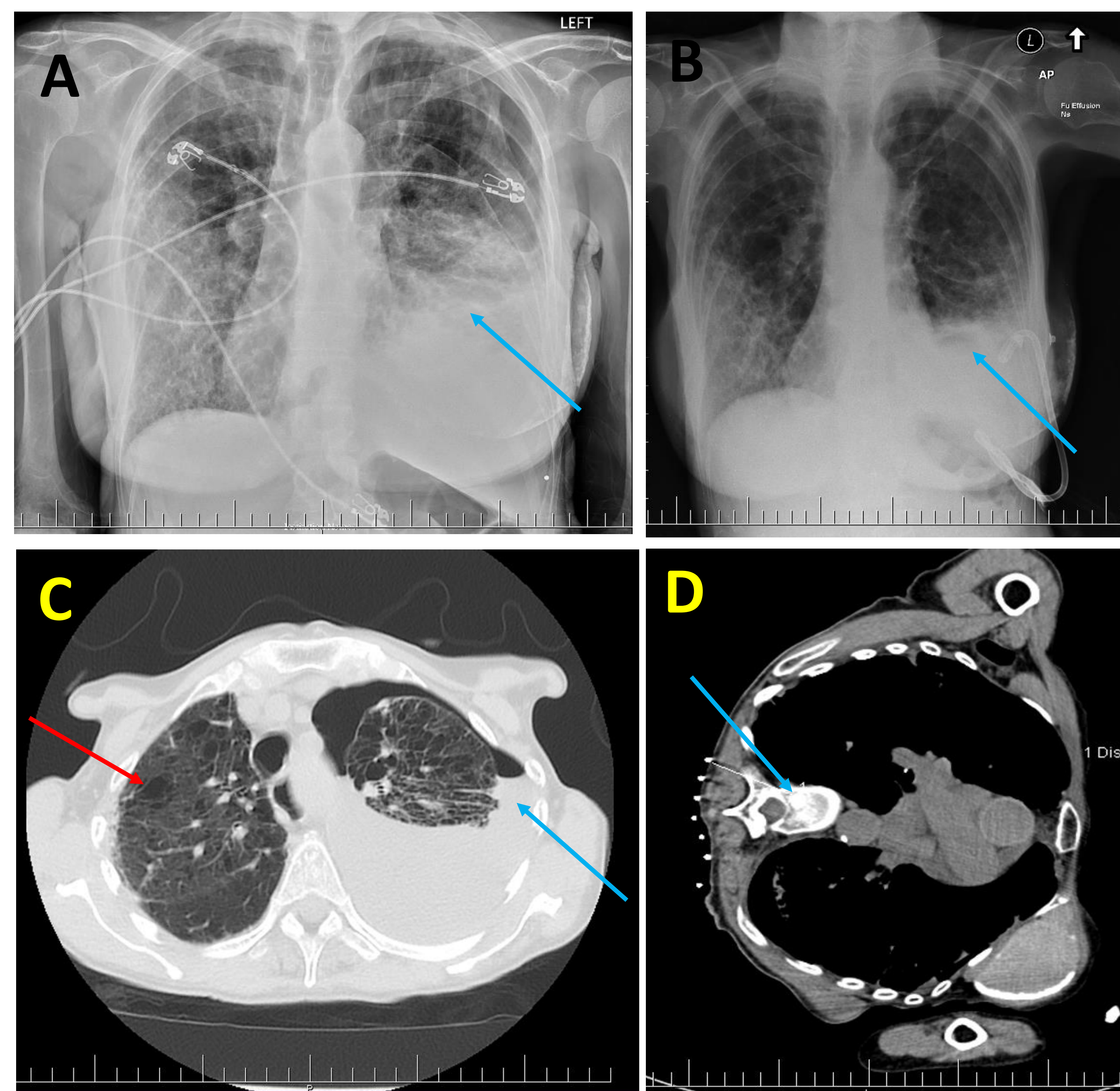
**HPI:** She described pleuritic chest pain with dyspnea on exertion, noticed after a mechanical fall four weeks prior to presentation. She had associated symptoms of poor appetite with significant unintentional weight loss.

**PMH:** History of arachnoiditis, non-malignant chronic low back pain with prior spinal fusion surgeries.

**Physical Examination:** Pertinent for cachexia with BMI of 14.5kg/m<sup>2</sup>, tachypnea and reduced breath sounds over left lung fields.

### Laboratory Data:

- Hb 15.9gm/dl, WBC 10,600/ $\mu$ l, HCT 47.7%, Platelet 549,000 / $\mu$ l.
- Na 137meq/l, K 4.5meq/l, CL 101meq/l, HCO<sub>3</sub> 24meq/l, Cr 0.74mg/dl, BUN 24mg/dl.
- Total protein 5.9 g/dl, Albumin 4.0g/dl, A/G ratio: 2.0
- Mg 1.8 mg/dl, Phos 4.2 mg/dl.
- BNP 475 pg/ml, Troponin 157ng/ml.
- Prealbumin 5.5 mg/dl.
- SARS-coV-2 Negative.
- Pleural fluid WBC 1807 cells/mcl, Albumin 2710 mg/dl, Amylase 251 unit/L, Cholesterol 62 mg/dl, Glucose 65 mg/dl, LDH 566 unit/L, pH 7.48.
- Pleural fluid culture and smear: Negative.



A) CXR showing large-left sided pneumothorax B) CXR showing improvement in hydropneumothorax and lung expansion post-chest tube placement C) CT of the chest without contrast showing dependent fluid with large left-sided hydropneumothorax with multiple parenchymal cysts and blebs. D) CT of the chest without contrast showing sclerotic lesions on the thoracic vertebrae.

## HYDROPNEUMOTHORAX

- Hydropneumothorax is a clinical entity describing the concurrent presence of both air and fluid in the pleural space.
- Recognized etiologies include chest trauma, infections and iatrogenic interventions, however its spontaneous occurrence in lung cancer is rare compared to isolated pneumothorax or pleural effusion.
- Hydropneumothorax frequently presents with pleuritic chest pain and dyspnea.
- Multiple mechanisms of developing hydropneumothorax in lung cancer have been proposed, but its pathogenesis remains incompletely understood.
- Most patients with lung cancer however have emphysematous changes in the lung parenchyma with blebs. These air pockets can rupture leading to air escaping into the pleural space resulting in a spontaneous pneumothorax.
- Though there are several case reports of pneumothorax as a presenting manifestation of lung cancer, to our knowledge, only three cases of hydropneumothorax as the presenting manifestation of lung cancer have been reported in the literature.

## HOSPITAL COURSE

- Chest X-ray revealed a large left hydropneumothorax with no evidence of rib fractures.
- CT of thorax showed diffuse, severe emphysematous changes with multiple parenchymal cysts, para-septal blebs, a large left-sided hydropneumothorax and several sclerotic lesions within the spine and lytic lesions along the posterior-inferior aspect of T12.
- Pleural fluid cytology demonstrated atypical cells positive for TTF 1 (Thyroid Transcription Factor) and MOC 31 (Epithelial Specific Antigen) indicative of primary lung adenocarcinoma.
- CT-guided percutaneous biopsy of sclerotic lesions on thoracic vertebrae revealed rare malignant cells positive for TTF 1 consistent with a primary lung malignancy.
- The patient had chest tube placement with drainage of approximately 1L serosanguineous fluid with radiologic confirmation of improvement in hydropneumothorax.

## DISCUSSION

- In our patient, although trauma from her mechanical fall may have played a role, hydropneumothorax may have occurred spontaneously secondary to underlying lung adenocarcinoma which was not known at the time of presentation.
- Treatment requires pleural drainage which allows for re-expansion of the collapsed lung.

## CONCLUSION

- Despite being an uncommon cause of hydropneumothorax, lung cancer should be considered in the differential diagnosis of such patients, especially older persons with a history of smoking.

### References:

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3. Maji A. Adenocarcinoma of lung presenting as hydropneumothorax: A rare presentation. J Pioneer Med Sci 2014; 4(1):3-5