Stroke like symptoms following a CT-guided lung biopsy: Perhaps a more common problem than previously realized.

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CASE

- An 80-year-old female with a past medical history of HTN, dyslipidemia and a 50 pack-year smoking history was referred for a CT-guided lung biopsy of a 3.5 x 2.7 cm cavitary lung lesion.
CASE

- Target lesion was localized.
- A total of three biopsies were taken with a coaxial 19-gauge introducer and 20-gauge Cook Quick-core biopsy device.
- Patient tolerated the procedure well.
- 1 hour and 45 minutes after the procedure she developed dysarthria, acute onset of left sided hemiparesis and right gaze preference.
- Stroke protocol was initiated.
PHYSICAL EXAM

VS: 97 °F (36.1 °C), 142/65, 60 bpm, RR 20, 100% on RA.

Neurological exam:
Mental Status: A&Ox3, failed object identification
Speech: Dysarthric with word finding difficulties
CN: PERRLA, CN II-XII intact
Tone: Increased tone in LUE and LLE
Sensation: Light touch sensation impaired in LUE and LLE
Strength: Strength 1/5 in LUE and LLE. Strength 5/5 in RUE and RLE
Reflexes: Reflexes brisk

Glucose: 87 mg/dL
CT NON CONTRAST
HOSPITAL COURSE

• Status epilepticus requiring AEDs.
• Extensive DVT started on anticoagulation.
• Difficulty in maintaining nutrition for which a percutaneous gastrostomy tube was placed.
• Persistent left sided hemiparesis requiring rehab and extensive therapy.
• Significant cognitive and speech deficits.
• Currently living in a group home.
COMPLICATIONS OF LUNG BIOPSY

Reported Complications:
• Pneumothorax – Most common
• Hemoptysis
• Seeding of the biopsy tract
• Air embolism – Reported incidence of 0.07% + additional case reports
• Death
EPIDEMIOLOGY

- RARE, but perhaps underestimated.
- No standard way of defining or reporting cases.
- Incidence may be underestimated by missing systemic air embolism in the absence of severe neurologic or cardiac sequelae.
A retrospective observational study of 610 patients who underwent percutaneous lung biopsy between 2007 and 2009 were analyzed and CT scans were examined retrospectively for air.

Radiologic incidence: 3.8%
Clinically apparent incidence: 0.49%
Mortality: 0.16%.
PATHOPHYSIOLOGY

Three postulated mechanisms:

- Placement of the needle in a pulmonary vein.

- Formation of a bronchial-venous fistula with air passing into the pulmonary vein if the alveolar or the venous pressure is too low.

- Passage of air via the pulmonary capillary bed from the pulmonary artery into the pulmonary venous system.
RISK FACTORS

• Coaxial biopsy system: Outer cannula is open to the air for a fraction of a second.
• Number of biopsies: If more biopsy specimens are taken then the cannula is open to air for a few seconds.
• Cystic or cavitary lesions: If the needle is not properly placed air can be introduced.
WHY DOES IT MATTER?

- Lung cancer is the leading cause of cancer death worldwide.
- The NLST showed that screening with low dose CT had a 20% relative reduction in lung cancer mortality.
- **USPSTF** recommends annual screening with low dose CT scan in adults aged 55-80 who have a 30 pack year smoking history of currently smoke or have quit within the past 15 years.
MORE COMMON THAN REALIZED

• CT-guided percutaneous lung biopsy is increasingly being used to investigate worrisome pulmonary lesions.
• Screening in a high risk population = high rate of positive examinations.
• Creating a large reservoir of patients at risk.
• **Bottom line:** As the number of biopsies increases, so too may this complication.
SUMMARY:

- Air embolism is a rare entity that may become more common with time.
- As this _dreaded_ complication may become more common in our everyday practice we should work diligently:
  - Recognize the condition
  - Create standardized protocols
  - Develop sound management plans
SOURCES


QUESTIONS

Thank you!

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