Transient visual loss following CT-guided percutaneous core needle biopsy of a lung lesion

Karina Bennett,1 Karla Totton,2 Arianna Misacas,1 Fiona Caswell,3 David Miller1

CASE

A 61-year-old man presented to primary care with a 5-month history of cough, haemoptysis, weight loss and fatigue. His medical history included diverticulitis, ischaemic colitis and hypercholesterolaemia. He was a former cigarette smoker with 20-pack year smoking history.

A left lower zone abnormality on chest radiograph prompted a thoracic CT, which demonstrated two left lower lobe masses concerning for metastatic disease but with no identifiable site of primary malignancy. Accordingly, a CT-guided percutaneous core needle biopsy was arranged to obtain a histological diagnosis.

The larger lung lesion (3.7 cm in diameter and 2.8 cm from the pleural surface) was biopsied. The patient was positioned prone and three cores were obtained with one needle pass using a 20 g×15 cm coaxial biopsy needle.

Immediately after the procedure, the patient reported dizziness, global limb weakness and total bilateral visual loss. He was treated with high flow oxygen with the bed positioned head down. A few minutes later, at the time of initial neurological assessment, his dizziness and limb weakness had fully resolved; other than visual impairment there was no demonstrable neurological deficit.

The postprocedure non-contrast CT thorax demonstrated gas within the left atrium (figure 1). A non-contrast CT head showed small areas of serpiginous low density in both occipital lobes in-keeping with systematic air embolism (figure 2). These changes were not evident on CT angiogram performed 3 min later which showed patent vertebral and basilar arteries.

DISCUSSION

Systematic air embolism is the entry of gas into the vascular system with variable clinical sequelae dependant on emboli size and location. Monnin-Bares et al1 retrospectively analysed 559 CT guided percutaneous lung biopsies and found the radiological incidence of systemic air embolism to be 4.8% with a clinical incidence of 0.17%.

We describe a case of rapid onset but transient neurological symptoms as a consequence of intra-cerebral systematic air embolism following CT percutaneous core needle biopsy of a lung lesion. Clinicians should consider this rare complication of lung biopsy as a diagnostic possibility in patients manifesting with neurological disturbances immediately post procedure.

The case also provides a unique and privileged insight into the radiological evolution of cerebral systematic air embolism. Our patient had two consecutive CT scans of his brain in close succession and promptly following the event. To our knowledge, CT images demonstrating this rapid resolution of the intracerebral gas have not previously been captured.

There are three proposed mechanisms for systematic air embolism during percutaneous core needle biopsy of the lung: needle inserted into...
the pulmonary vein; bronchovenous fistula creation; and air from the pulmonary arteries passing into the venous system.\textsuperscript{2} Risk factors for systematic air embolism following lung biopsy include: depth of needle insertion, endotracheal anaesthesia, location of the lesion above the left atrium, higher number of biopsy samples and prone or right lateral decubitus positioning of the patient.\textsuperscript{1,3}

High-flow oxygen and positioning the patient on to their right side (to maintain the systematic air embolism superiorly within the left ventricle away from the left ventricular outflow tract) have been proposed in the immediate management. Hyperbaric oxygen therapy, which dissolves the air within embolised bubbles by accelerating nitrogen resorption, can also be considered.

**Contributors** All of the above authors meet the four ICMJE criteria for authorship. All authors made substantial contributions to the conception and design of the work. All authors were directly involved in our patients’ care whilst in hospital and each offered a unique perspective coming from different clinical specialties. KB drafted the main document. FC provided the images. All authors revised it critically for important intellectual content and gave final approval for the version to be published. All authors agree to be accountable for all aspects of the work and that questions related to the accuracy for the integrity of any part of the work are appropriately investigated and resolved.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient consent for publication** Consent obtained directly from patient(s).

**Provenance and peer review** Not commissioned; externally peer reviewed.

**ORCID iD**

Karina Bennett http://orcid.org/0000-0001-9828-5558

**REFERENCES**

