A 56-Year-Old Woman With Nonresolving Pneumonia

Mohammad Arabiat, MD; Priyanka Bhat, MBBS; Rodney Steff, DO; and Karan Singh, MBBS

A 56-year-old woman, who is a current smoker, presented to the hospital complaining of productive cough, shortness of breath, and malaise. Chest radiography followed by a CT chest scan showed a large cavitary lung mass that involved the upper and middle lobes of the right lung. Sputum Gram stain and culture, urine streptococcus antigen, and blood cultures were negative during that hospitalization. She was treated with a 4-week course of antibiotics (piperacillin/tazobactam followed by amoxicillin/clavulanic acid). Repeat CT scan results after 1 month from initial presentation were unchanged (Fig 1), and her symptoms persisted. The lesion was also visible on point-of-care ultrasound scan (Fig 2; Video 1).

Her condition was stable hemodynamically, with oxygen saturation 94% on room air. Her laboratory studies showed the following results: WBC count 21,000 with neutrophilic predominance of 82% and no bands; hemoglobin, 7.1 g/dL, which is her baseline; platelets, 600,000 µL; and procalcitonin, 0.23 ng/mL.

Bronchoscopy was performed with plans for BAL, transbronchial needle aspiration, and forces biopsy. Bedside point-of-care ultrasonography of the chest was performed during the bronchoscopy to facilitate transcutaneous core biopsy (Video 2).

Question: What is seen in Video 2? Can lung ultrasonography be used as a complementary guide in addition to standard fluoroscopy for transbronchial needle aspirate biopsies?
Answer: Yes, the injection of a normal saline solution flush through the working channel of the bronchoscope was visualized on the thoracic ultrasound examination in real time and helped to confirm the satisfactory location of the bronchoscope as seen in Video 2.

Discussion

Lung cancer is the most common malignancy in men and women combined and is the most common cause of cancer-related death. Tissue diagnosis of lung cancers can be done with CT-guided biopsy or bronchoscopy. Traditionally, fluoroscopy is used to guide bronchoscopic biopsy. Newer, more expensive tools like navigational bronchoscopy also allow more precise localization of lung nodules but require costly equipment and need general anesthesia.

Theoretically, any lung mass that is in contact with the pleural surface can be visualized with lung ultrasound examination. This can facilitate percutaneous lung biopsy by allowing larger tissue samples; however, bronchoscopy in conjunction with endobronchial ultrasound examination is often needed to complete staging. Ultrasonographic biopsy potentially may be superior to CT scanning in lesions with lesion-pleural contact arc length more than 4 cm. The use of point-of-care sonography obviated the need for fluoroscopy and had the advantage of no exposure to radiation. We also used ultrasound examination as a guide to core needle percutaneous biopsy in the patient. Combining transbronchial needle aspirate with percutaneous needle aspirate of peripheral lung lesions increases the yield of the biopsy. It is important for the astute bronchoscopist to use all the tools in the armamentarium to facilitate a diagnosis, and point-of-care ultrasound examination is a valuable addition to all available techniques.

The specimen, under light microscopy, showed sheets of neoplastic cells (Fig 3). On immunoperoxidase staining, p40 and high molecular-weight cytokeratin were positive, and TTF-1 was negative, confirming a diagnosis of squamous cell carcinoma. The patient subsequently underwent a PET CT scan and an MRI of the brain and was referred to oncology for further treatment.

Reverberations

1. Lung ultrasound scanning can help in real-time localization of bronchoscope with the use of a saline solution flush for lung masses that are peripheral in location and large enough to be seen in a point-of-care scan.

2. The treating physician must not be hemmed into “silos” but must use all available tools to facilitate a diagnosis.

3. Use of lung ultrasound examination can facilitate the pulmonologist to perform a percutaneous biopsy, which can obviate the need for general anesthesia and allow larger core biopsies.

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Additional information: The Videos can be found in the Supplemental Materials section of the online article.

References

