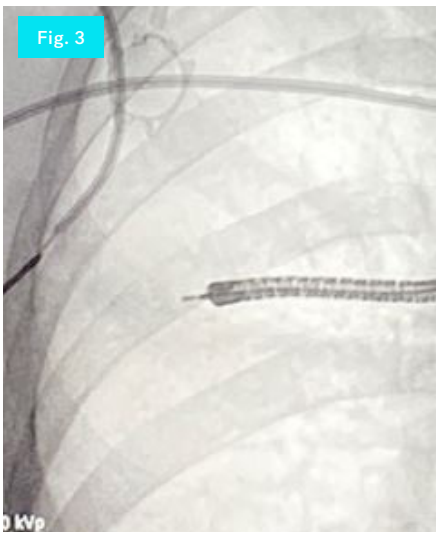
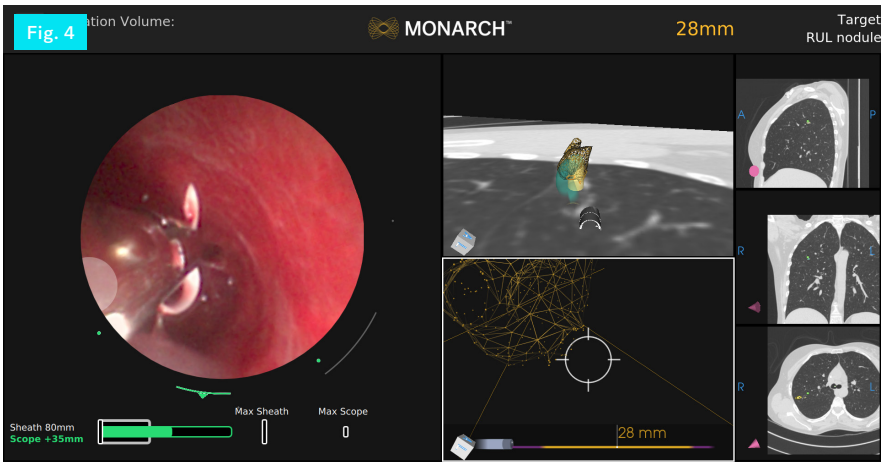
Foreign Body Removal of Inhaled Plastic Fibers

Dr. Lauren Ventola

CASE STUDY





NODULE CHARACTERISTICS

Lobar Location
Right upper lobe
posterior segment

Nodule Size
13 mm x 10 mm

Procedure Details
Navigation Time:
9:00 minutes
Physician's second case with MONARCH® Platform

Total Procedure Time:
102:00 minutes

Fig. 1 CT image of right upper lobe lung nodule

Fig. 2 PET image of right upper lobe 13 mm x 10 mm lung nodule with SUV 2.1

Fig. 3 Fluoroscopy image showing MONARCH® Scope at the target

Fig. 4 Screen Image of MONARCH® Platform retrieving foreign body

BACKGROUND

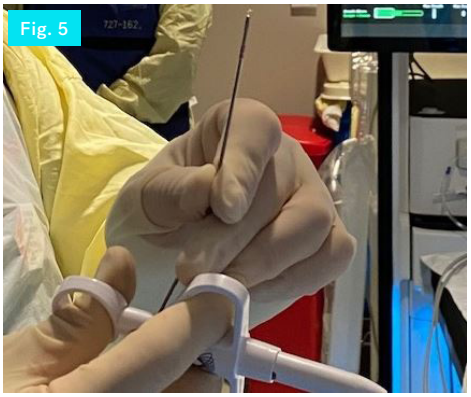
A 39-year-old female recently diagnosed with cervical cancer status post-surgical resection and currently receiving chemotherapy and radiation. Staging PET showed right hilar lymphadenopathy with SUV 4.8 and a right upper lobe 13 mm x 10 mm lung nodule with SUV 2.1. (**Fig. 1 & 2**) Of note she has a 20 pack-year smoking history, family history of lung cancer in both parents and is currently employed working on the floor of a plastic factory.

PLANNING/PROCEDURE

Examination of CT revealed no discernable bronchus sign, but a nearby adjacent airway and a large vessel suggested an airway may pass close enough to allow successful biopsy. Pre-procedure planning focused on an airway away from intervening vasculature and parallel to the fissure.

The procedure began with endobronchial ultrasound and staging biopsies of the right paratracheal, subcarinal and right hilar lymphadenopathy, which on rapid onsite cytology showed normal lymph node tissue only. Airways were then cleared, and the procedure transitioned to a robotic-assisted bronchoscopy with the MONARCH® Platform. While maintaining a central position of the MONARCH® scope and using intermittent puffs of air, full visualization was maintained out to the periphery of the lung where the nodule was located. At the position of the nodule, confirmed by fluoroscopy (**Fig. 3**), a small white foreign body was noted and removed with MONARCH® biopsy forceps. (**Fig. 4**)

> *As a new user who has never been able to see the periphery of the lung bronchoscopically, the MONARCH® navigation system opened a new world of what I am able to access safely for my patients. This case taught me the value of vision as well as the importance of keeping an open mind regarding the differential for pulmonary nodules.*



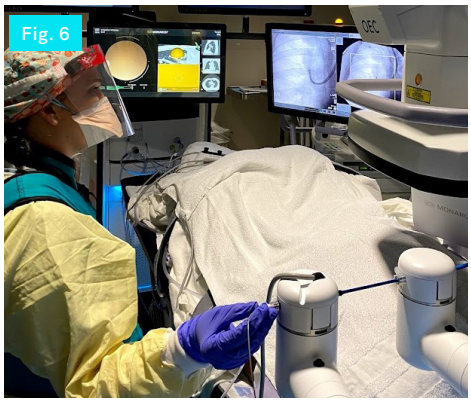


Fig. 5 Forceps image of foreign body

Fig. 6 Dr. Ventola performing MONARCH® Robotic-Assisted Bronchoscopy

Following removal, biopsies were performed with a 21-gauge FNA needle, biopsy forceps and bronchoalveolar lavage. (**Fig. 5 & Fig. 6**) Final pathology showed macrophages and inflammation. The procedure was complicated by a pneumothorax requiring chest tube for 24 hours.

This nodule was followed up in 6 weeks with a repeat chest CT showing stability. Due to risk factors and concern for possible metastatic disease, the patient underwent a right upper lobe wedge resection. Final pathology confirmed caseating granulomatous inflammation. Based on bronchoscopic and surgical findings, the nodule was likely related to inhaled plastic fiber from her place of employment.

CONCLUSION

1. **Confirm**
   Although a wedge resection was performed due to underlining risk factors and concern for metastatic disease, not all nodules are malignant. The vast majority of nodules are from benign sources such as previous infections or inflammatory responses.
2. **Vision**
   The MONARCH® technology shows visualization to the periphery of the lungs, allowing for better localization of sub-centimeter nodules as well as identifying foreign bodies.

Lauren Ventola, M.D. Centennial Medical Center, Nashville TN

Lauren Ventola, MD received her medical degree from St. George's University and is affiliated with Tri-Star Centennial Medical Center in Nashville, TN. She completed her internal medicine residency, pulmonary critical care fellowship and interventional pulmonology fellowship at Penn State Health. She is a member of the ACCP, ATS, AABIP and Women in Interventional Pulmonology.

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150 SHORELINE DR. REDWOOD CITY, CA 94065 TEL: [650] 610-0750