

Localization of LUL Nodule for Surgical Resection with the MONARCH® Platform

Dr. Wilson S. Tsai

CASE STUDY

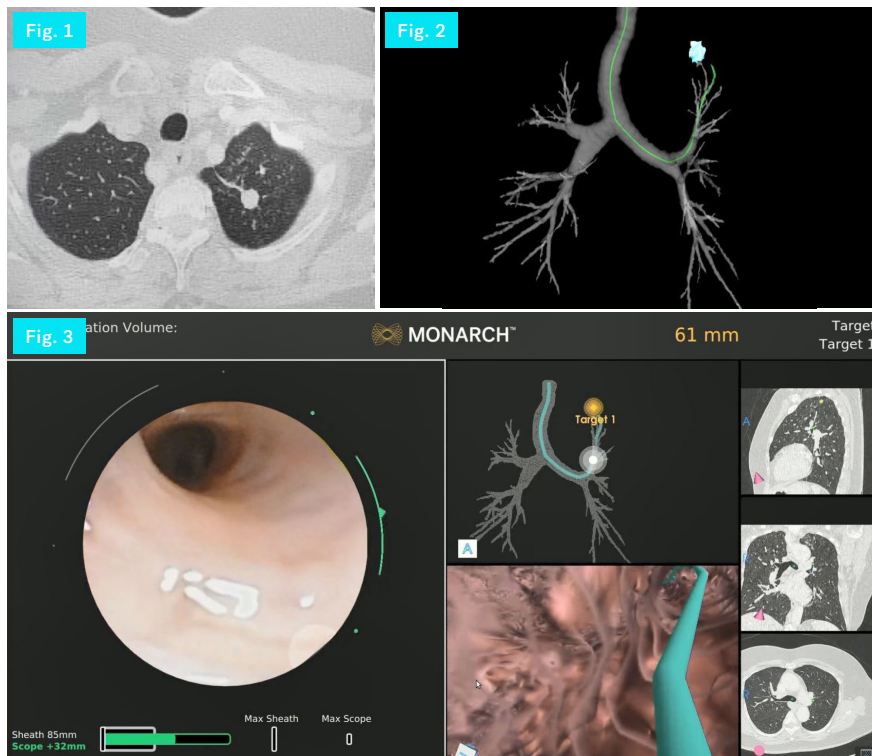


Fig. 1 Axial CT of apical nodule
Fig. 2 Pre-procedure planning of nodule close to apical segment
Fig. 3 MONARCH® platform navigating to the area of interest

NODULE CHARACTERISTICS

Lobar Location
Left Upper Lobe, Apical

Nodule Size
1.2 cm x 1.1 cm

Bronchus Sign
No

Procedure Details
Navigation Time: 4:00 minutes

Total Procedure Time:
10:00 minutes

Biopsy Tools Used:
TBNA Needle

Final Diagnosis: Multifocal
Granulomas

Therapeutic Interventions:
Surgical Resection

BACKGROUND

A 64-year-old female with a history of tuberculosis and additional co-morbidities presented with a chronic cough and hemoptysis. A chest CT was performed and revealed a left upper lobe nodule. She underwent a CT-guided biopsy which resulted in a diagnosis of coagulative necrosis with chronic inflammation and interstitial fibrosis. Subsequently, the patient was placed on a 4-month cycle of rifampin and a repeat CT was ordered at the conclusion of treatment. The left upper lobe nodule remained unchanged (**Fig. 1**) after treatment and the patient was referred to surgery for a wedge resection of the area in question.

PROCEDURE

Initial pre-procedure planning identified the nodule close to the apical segment in the left upper lobe with no discernible bronchus sign. A plan was created utilizing an airway that was near the area in question that would be used to gain access (**Fig. 2**).

Once the MONARCH® Platform was in position, the targeted region was reached within a few minutes of scope insertion (**Fig. 3**). In order to gain the appropriate trajectory, controlled scope movements were utilized to get within 1 cm of the nodule. The outer sheath of the platform offered additional stability for instruments to pass through and to localize the area for surgical resection. Localization included 0.75 cc of methylene blue that was injected into the nodule without an air chaser and this was followed up with 0.75 cc of ICG fluorescent dye injection without an air chaser per physician protocol.



The stability of the system has allowed for multiple biopsies as well as treatment options to be performed with confidence.

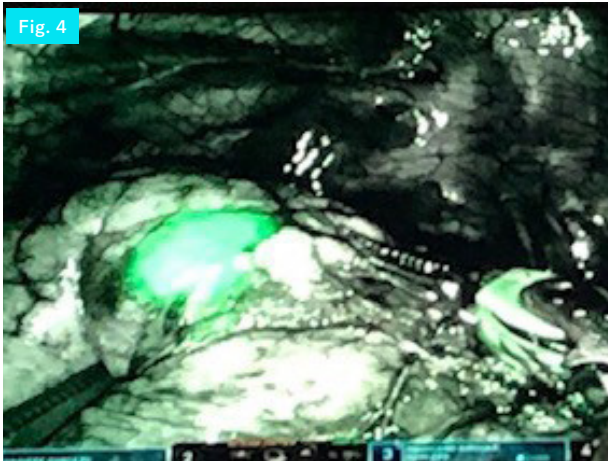


Fig. 4 Confirmed dye marking of targeted nodule



Fig. 5 Resected lung

In the same procedure, the MONARCH® Platform was de-docked and the patient was positioned for a robotic thoracoscopy and left upper lobe wedge resection. The robotic surgical platform confirmed accurate placement of the localization dyes (**Fig. 4**) and proceeded with surgical removal of the lesion (**Fig. 5**)

Final surgical pathology revealed multifocal caseating granulomas and the patient was discharged home within 1 day of her procedure. This single procedure gave the patient the added reassurance that she needed given her current medical history.

CONCLUSION

The improvements made with navigational bronchoscopy by incorporating in robotic technology has elevated the possibilities in both biopsy and localization procedures. The stability of the MONARCH® Platform positively impacted the ability to localize hard to reach areas of the lung and confidently surgically resect small non-palpable nodules.



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Dr. Tsai is a board-certified thoracic surgeon and the Co-Director of the Thoracic Surgical Program at John Muir Health. He is based in Walnut Creek, CA. and has established a minimally invasive thoracic program that specializes in all aspects of benign and malignant esophageal and lung disease.

Indications for Use: The MONARCH® Platform and its accessories are intended to provide bronchoscopic visualization of and access to patient airways for diagnostic and therapeutic procedures.

Important Safety Statement: Complications from bronchoscopy are rare and most often minor, but if they occur, may include breathing difficulty, vocal cord spasm, hoarseness, slight fever, vomiting, dizziness, bronchial spasm, infection, low blood oxygen, bleeding from biopsied site, or an allergic reaction to medications. It is uncommon for patients to experience other more serious complications (for example, collapsed lung, respiratory failure, heart attack and/or cardiac arrhythmia).



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