

Vision & Robotic Control Lead to Peripheral Nodule Diagnosis

Dr. Stephen Kovacs

CASE STUDY

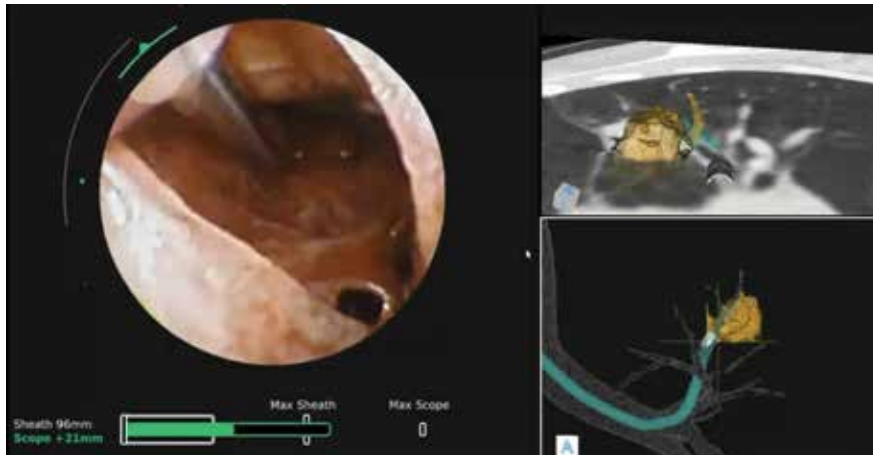


Fig 1. Biopsy needle (upper left) slides directly into a suspicious nodule. Biopsy obtained after using continuous vision and robotic tip control to create a path to the nodule and transform an eccentric REBUS image into a concentric pattern.

Data on File

BACKGROUND

51 year old male with 60+ pack year smoking history entered the ER with shortness of breath associated with exacerbated emphysema. Chest x-ray revealed perihilar fullness and prompted a CT scan showing a LUL measuring 1.8 x 1.3cm. Patient was admitted on a Saturday and underwent bronchoscopy within 72 hours. History of emphysema with frequent exacerbations made this a high-risk surgical candidate.

PROCEDURE

Pre-Procedural Plan

Two pathways were created using a CT scan and planning software. The target airway appeared to run alongside the nodule. A difficult navigation and alignment were anticipated based on anatomical location and airway-to-nodule relationship.

Navigation

Monarch sheath/scope flexibility and continuous vision aided tremendously during navigation. Once the targeted airway was accessed, REBUS showed a classic eccentric pattern. The scope was slightly repositioned and a biopsy needle was inserted to create a small hole through a tissue blockage. The REBUS probe was then fed through this small opening and a perfect concentric pattern was achieved. A biopsy needle was then directed into the nodule (Fig 1), using the live camera video for guidance.

Biopsy & Treatment

The first needle biopsy returned a diagnosis of Adenocarcinoma from onsite Pathology. Several more tissue biopsies were collected to enable tumor genetic profiling. Continuous vision and robotic tip control aided in the tissue collection process. The patient is now with Radiation Oncology to begin treatment.

NODULE CHARACTERISTICS

Lobar Location

Left upper lobe

Size (Diameter Max/Min)

1.8cm x 1.3cm spiculated, abutting fissure

Bronchus sign

Airway adjacent to nodule

REBUS

Eccentric to concentric

Fluoro

Invisible

Nodule visible with Monarch™ Platform?

Invisible, became visible

CASE INFORMATION

Navigation time

17 minutes

Biopsy time

12 minutes

Biopsy Tools used

Monarch needle, forceps



Fig 2. CT Scan

“To have the abilities of direct peripheral visualization of a tumor in combination with precise robotic control allowed us to turn this traditionally low yield procedure into a positive early diagnosis. This demonstrates the next evolutionary step in peripheral bronchoscopy.”

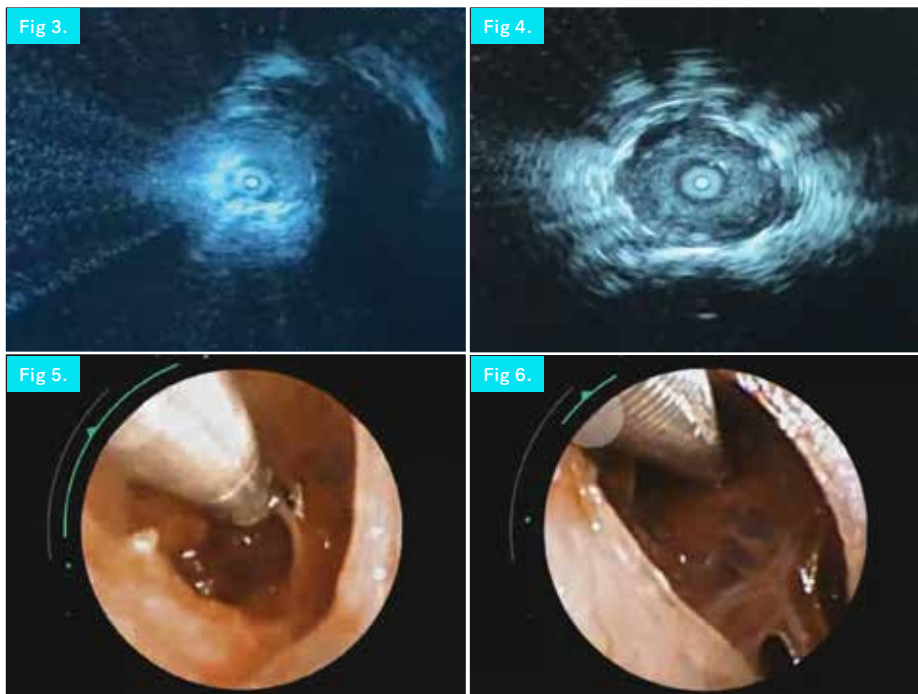


Fig 3. Eccentric REBUS pattern

Fig 4. Concentric REBUS pattern after creating small airway passage to nodule

Fig 5. Camera view with REBUS probe present in upper left yielding eccentric pattern

Fig 6. Camera view with REBUS probe inserted directly into nodule

CONCLUSIONS

1. Procedural Success

Achieving a diagnosis on this case was anticipated to be difficult given the anatomical location of the nodule and the tortuous path needed in order to place a biopsy instrument into the area of interest. An eccentric REBUS pattern suggests a diagnostic yield of 30-48%, whereas a concentric pattern suggests a yield closer to 75-80%. The ability of the Monarch™ Platform to provide continuous vision when using adjunct tools and transform a REBUS pattern from eccentric to concentric raises expected diagnostic yield and procedural confidence.

2. Vision & Robotic Control

The ability to utilize a continuous, live camera during deployment of various probes and biopsy tools, coupled with robotic micromovement control, was a tremendous difference-maker in this procedure. Vision+Robotic Control represents an exciting technological leap in peripheral bronchoscopy.

3. Navigation

The Monarch Platform's novel sheath/scope combination is able to access areas of the lung traditionally categorized as "untouchable" with more conventional methods. The ability to "park" the sheath some distance away from the target provides a useful "anchor point" from which to continue on with the flexible scope.

1. Chen AC, Loiselle A, Zhou L, Baty J, Misselhorn D. Localization of peripheral pulmonary lesions using a method of computed tomography-anatomic correlation and radial probe endobronchial ultrasound confirmation. *Ann Am Thorac Soc* 2016;13:1586-1592.



About Dr. Stephen Kovacs

Dr. Kovacs is a Board-Certified Pulmonologist at the University of Pittsburgh Medical Center in Erie, Pennsylvania

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).

This document reflects the techniques, approaches and opinions of the individual physician. This Auris sponsored document is not intended to be used as a training guide. Other physicians may employ different techniques. The steps demonstrated may not be the complete steps of the procedure. Individual physician preference and experience, as well as patient needs, may dictate variation in procedure steps. Before using any medical device, review all relevant package inserts with particular attention to the indications, contraindications, warnings and precautions, and steps for use of the device(s).

Dr Stephen Kovacs is compensated by and writing on behalf of Auris Health and must present information in accordance with applicable FDA requirements.

