Technology

Endobronchial Ultrasound Guided Bronchoscopy

A NEW TECHNIQUE FOR DIAGNOSING LUNG CANCER

The role of diagnosing lung cancer in at-risk patients and its impact on outcomes are among the most critical issues in pulmonary medicine. Endobronchial Ultrasound Guided Bronchoscopy (EBUS) is a relatively new procedure used in the diagnosis of lung cancer, infections, and other diseases causing enlarged lymph nodes in the chest. Lakeland Regional Medical Center, St. Joseph, is one of the few hospitals in Michigan to offer EBUS, a minimally invasive procedure that has proven highly effective.

One of the more challenging tasks for pulmonologists has been the biopsy of abnormal nodes or masses outside of the airway in the hilum or mediastinum. “In the past, we could see an image on a CT Scan and use that to determine where to stick the needle. The problem is you don’t always know what else could be there; you may accidentally stick the needle into a blood vessel or part of the lung,” says Robert Piasecki, DO, a Pulmonologist practicing in St. Joseph. “Locating the correct place to biopsy has been significantly improved with the use of the ultrasound guided bronchoscope.”

The EBUS was developed in the mid-1990s. It has only become available in the last few years to the non-university based pulmonologist. Piasecki, who has performed close to 50 EBUS procedures in the past year and half, says this device allows him direct visualization of the nodes or mass, which can sometimes reduce the need for more invasive procedures such as a mediastinoscopy. “I can clearly see what I am biopsying which allows for better accuracy and cuts down on complications that can occur with this type of procedure,” says Piasecki.

There are two different types of ultrasound probes for use with EBUS: radial and convex. The bronchoscope uses the convex probe and offers a 30 degree image that is perpendicular to the scope. An added feature is color flow Doppler views that allow better identification of vascular, ductile and cystic structures. The tip of the probe has a curved surface that can be applied directly to the bronchial wall or through a saline inflated balloon. The transbronchial needle can be introduced through the working channel directly into the airway for real-time ultrasound monitoring of the aspiration. The real-time views of the endobronchial airways are seen simultaneously with the ultrasound images. It is this visual acuity that increases the diagnostic accuracy of the procedure, as well as safety for the patient compared to conventional bronchoscopy.

The EBUS bronchoscope can be used to biopsy lymph nodes, some of which cannot be sampled by the surgeon. According to an article published in EndoNurse Magazine, some studies have shown an increase in accuracy from a range of 30 percent to 80 percent, to as high as 96 percent with the addition of real-time imaging using the EBUS. This procedure is typically done with local anesthesia and conscious sedation, avoiding the need for general anesthesia and a mediastinoscopy. “Overall, this procedure is easier on the patient, who may afterwards only complain about a sore throat,” says Piasecki. “There are multiple benefits for the patient, starting with the fact that it is less invasive; there are no incisions and no overnight stays in the hospital.”

One of the main disadvantages of the EBUS procedure is that the biopsy needle specifically designed for this scope is 22 gauge. While this is generally accurate for many cancers, it is less helpful if the diagnosis may be sarcoidosis, atypical infection, or lymphoma. The risks associated with EBUS are no different than standard bronchoscopy. There is still a risk of bleeding and pneumothorax, but far less than what is observed with traditional blind TBNA. Based on his results, Piasecki says any complications with EBUS have shown to be well under one percent.

“We are offering patients an option that is less invasive and that may get them the same answers and diagnosis as having to go through surgery. I want physicians in the community to be aware that EBUS is available right here in southwest Michigan. It’s not something that is generally available at every hospital,” says Piasecki.

To learn more about Endobronchial Ultrasound Guided Bronchoscopy (EBUS), or to schedule a consultation with Dr. Robert Piasecki, call Pulmonary Partners at (269) 982-5864.
Case Study #1

**Abstract:** Patient is a 69-year-old white male who had a syncopal episode and was told he was hypotensive. Patient denies any hemoptysis. He has had increased shortness of breath with going up a flight of stairs. He has no history of any chest pain. During a hospital admission the patient was found to have an abnormal chest x-ray and subsequent CT scan of the chest showed a lung mass. There is no history of any trauma to the chest.

**Medical History:** Hyperlipidemia, hypertension, non-insulin-dependent diabetes mellitus and the above.

**Social History:** Patient admits to a smoking history of a half to one and half packs of cigarettes a day for 50 years. He denies any alcohol use and has no pets in the home.

**Outcome:** Right Paratracheal Endobronchial Ultrasound Guided Bronchoscopy (EBUS) needle positive for malignancy; morphologically consistent with non small cell carcinoma. Left upper lobe bronchial brushing negative for malignancy. Left upper lobe bronchial washing suspicious for malignancy.

Case Study #2

**Abstract:** Patient is a 70-year-old white female who developed atrial fibrillation after exercise. She was sent to the ER for a follow up. The patient was found to have an abnormal chest x-ray and a subsequent CT scan of the chest suggested a left lower lobe mass with left hilar and mediastinal adenopathy. She denies any shortness of breath, has rare white phlegm production, no chest pain, no trauma to the chest, and no fevers.

**Medical History:** Previous atrial fibrillation after an aortic valve replacement, hyperlipidemia, and osteoporosis.

**Social History:** Patient quit smoking two weeks prior to incident. She had been down to one pack per week. She admits to smoking up to one pack a day for the past 50 years. There are no pets in the home and she rarely uses alcohol.

**Outcome:** Subcarinal Endobronchial Ultrasound Guided Bronchoscopy (EBUS) needle and slides positive for malignancy; morphologically consistent with small cell carcinoma. LLL washing positive for malignancy; morphologically consistent with small cell carcinoma.