

## **TBNA Past, Present and Future. Ko Pen Wang, MD FCCP, Baltimore, MD**

Transbronchial needle aspiration (TBNA) has been a useful technique for minimally invasive biopsy of mediastinal lymph nodes and masses for decades. TBNA was first described in the literature using a rigid bronchoscope and rigid needle by Dr. Eduardo Schieppati, in the Review of the Argentine Medical Association in 1949. When Dr. Shigeto Ikeda introduced the flexible bronchoscope to the world in 1968, investigators quickly began to adapt rigid bronchoscopy techniques and instruments to be utilized with flexible bronchoscopy. In 1983, a novel flexible needle that could be used with the flexible bronchoscope to successfully perform TBNA was developed and introduced for diagnosis and staging of mediastinal adenopathy and masses. Shortly after this, in 1984, the efficacy and utility of TBNA in diagnosis of peripheral pulmonary nodules was established. In 1985, Wang went on to develop a histology needle for the flexible bronchoscope and demonstrated the efficacy and safety of its use in TBNA. These rapid advancements in the clinical utility and indications for TBNA continued and in 1989, Wang et. al, published the results from a series of 61 patients demonstrating the effectiveness of TBNA in the diagnosis of sarcoidosis. Refinements in needle design, imaging and biopsy guidance continued, but a nationwide survey of pulmonologists in 1991 reported infrequent use of TBNA by the majority of pulmonologists. In an effort to increase the utility of TBNA for the pulmonary community, a standard lymph node map based on CT lymph node (LN) location with corresponding endobronchial puncture sites was published describing the most common TBNA stations in the mediastinum and hilar areas. Despite efforts to simplify and teach the technique, a 1999 survey continued to indicate that TBNA remained underutilized in practice and in fellowship training. Advances in imaging technology over the years have resulted in markedly improved optics but essentially the basic function and technique of the flexible bronchoscope and transbronchial needle have remained the same. More recently, ultrasound imaging has been added to some videobronchoscopes allowing for real-time TBNA under endobronchial ultrasound guidance (convex probe EBUS TBNA). While EBUS TBNA has received much attention in the literature, the additional cost and training have limited its widespread use. Other technological advances for TBNA guidance such as electromagnetic navigation bronchoscopy (ENB) and CT bronchoscopy face similar challenges of added expense and training in the face of limited reimbursement. These exciting new technologies have refocused the pulmonary community on TBNA and we should capitalize on this by increasing efforts to improve training quality and availability for standard TBNA as well as EBUS TBNA. Objective clarification for the role for each of these techniques is still needed. In our experience with over 200 patients using standard TBNA and EBUS TBNA on each patient, only 5 cases did EBUS TBNA add to the diagnosis. In the future, we will likely be required to justify the cost and provide only the best value to the patient and health care system for our diagnostic procedures. The vision for the future should include applying technological advances to revolutionize our instruments and techniques, focusing on patient comfort, optimizing yield, simplifying instruments, maximizing ease of use and minimizing training requirements for the pulmonologist.

1. Wang KP, Terry P. Transbronchial Needle Aspiration in the Diagnosis and Staging of Bronchogenic Carcinoma. *Am Rev Respir Dis* 1983; 127:344-347.
2. Wang KP, Haponik EF, Britt JE, Khouri N. Transbronchial needle aspiration of peripheral pulmonary nodules. *Chest* 1984;86:819-823.
3. Wang KP. Flexible transbronchial needle aspiration biopsy for histologic specimens. *Chest* 1985;88:860-863.
4. Wang KP, et al. Flexible transbronchial needle aspiration for the diagnosis of sarcoidosis. *Annals of Otology, Rhinology, Laryngology* 1989;98:298-300.
5. Wang KP. Staging of bronchogenic carcinoma by bronchoscopy. *Chest* 1994;106:588-593.
6. Herth FJ, Becker HD, Ernst A. Ultrasound-guided transbronchial needle aspiration: an experience in 242 patients. *Chest* 2003; 123:604-607.
7. Yasufuku K, Chiyo M, Sekine Y, et al. Real-time endobronchial ultrasound-guided transbronchial needle aspiration of mediastinal and hilar lymph nodes. *Chest* 2004; 126:122-128.