WABIP Newsletter

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Inside This Issue

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INSIDE THIS ISSUE:

Opinion/Editorial

The Role of Interventional Pulmonologist/Bronchologist in the Multidisciplinary Management of Lung Cancer

Interventional pulmonology/bronchology is an emerging field encompassing many minimally invasive techniques for the diagnosis and management of lung cancer, central airway obstruction, and pleural disease. Advances in new technologies increasingly warrant involvement of the interventional pulmonologist/bronchoscopist in the multidisciplinary management of patients with lung cancer.

Various tools and devices are available for the minimally invasive transbronchial approach and sampling of peripheral nodules. While percutaneous CT-guided FNA is still the standard, bronchoscopists are able to perform transbronchial biopsies for CT-guided approach. For mediastinal exploration, EBUS-TBNA is probably one of the most significant advances in the field since the invention of the flexible bronchoscope by Dr. Ikeda in 1966. EBUS-TBNA allows minimally invasive mediastinal lymph node sampling and can avoid more invasive surgical staging in the majority of patients with known or suspected enlarged mediastinal or hilar lymph nodes. EBUS-guided TBNA is being performed in over 2500 centers around the world. It is now the responsibility of bronchoscopists performing EBUS-TBNA to stage patients properly. In some cases, we are able to perform complete mediastinal lymph node staging as well as obtain tissue diagnosis from the primary tumor. Finally, therapeutic interventions performed by interventional pulmonologists / bronchoscopists provide palliation of airway obstruction and malignant pleural effusion to improve QOL and survival for patients with advanced lung cancer.

Our specialty is in a position to be involved heavily in the multidisciplinary management of patients with lung cancer. It is our responsibility, therefore, to achieve the best possible patient outcomes utilizing the safest technologies and most effective patient-centered approaches currently available.

Editor-in-chief

Kazuhiro Yasufuku

News of Humanitarian Activities

The WABIP would like to acknowledge the efforts and achievements of Professor Eric Edell, who has initiated an educational program in El Salvador.

Professor Eric Edell (project leader) describing educational resources to a group of enthusiastic bronchoscopists.

Partnering with Bronchoscopy International, the WABIP, and the Argentine Association for Bronchology, Dr. Edell has implemented a program sponsored for the most part by the Mayo Clinic, Rochester MN. This program includes site visits, equipment donations, didactic lectures, hands-on training, and incorporation of Bronchoscopy Education Project materials in Salvadoran training programs in an effort to improve bronchoscopy and airway management training in Central America.

Working with members of several hospitals in San Salvador, Dr. Edell and our Argentine colleagues Dr. Patricia Vujacich and Dr. Pedro Grynblat (all certified Master Instructors), have conducted Introduction to Flexible Bronchoscopy Courses as well as Faculty Development Programs on-site in El Salvador. All lectures and hands-on training sessions were conducted in Spanish. Bronchoscopy Education Project training materials, including assessment tools and checklists were translated into Spanish by members of the Argentine Association for Bronchology. Dr. Victor Castro Barahona, of San Salvador (Certified instructor) attended last year's faculty development program in Buenos Aires. He is diligently working with Dr. Edell and the Argentine group to plan future programs in his country.

Dr. Victor Castro Barahona preparing for instruction during a hands-on training session in San Salvador.

The on-site team has been extremely touched by the warm hospitality received from our colleagues in El Salvador. The WABIP looks forward to welcoming bronchoscopists from El Salvador, and all Central America into the WABIP!

Technology Corner

Technology corner: Narrow Band Imaging

Introduction: In bronchoscopy, optical imaging modalities include 1) technologies that visualize airway surface (white light bronchoscopy (WLB), high magnification bronchoscopy (HMB) narrow band imaging (NBI), auto fluorescence bronchoscopy (AFB)) and 2) technologies that image airway wall below the tissue surface and offer near histological resolution of the airway wall microstructures (confocal microscopy (CFM), optical coherence tomography (OCT)). This section will discuss the rationale and principles of NBI and how this modality differs from other optical imaging techniques.

Background: When a tissue surface is illuminated onto a tissue surface (Figure A), light is reflected (specular reflection), absorbed, induces autofluorescence, propagates into tissues and scatters at the same wavelength as the incident light (elastic scattering), or scatters at a different wavelength (inelastic or Raman scattering) by exciting molecular vibrations.

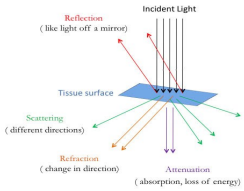
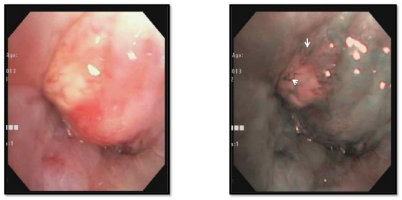


Figure A: Basic light-tissue interactions

These light-tissue interactions constitute the basis for bronchoscopic optical imaging modalities. WLB uses reflection, scattering and absorption properties of broadband visible light from ~400 nm to 700 nm. WLB serves to define the structural features of the airway surface and distinguish normal from abnormal tissues. Narrow bandwidths reduce scattering light from other wavelengths present in the broad white-light spectrum and enable enhanced visualization of blood vessels. This property is responsible for this imaging method to be classified as image-enhanced endoscopy technology (1). Narrowband blue light centered at 415 nm (400 nm to 430 nm) and green light centered at 540 nm (530–550 nm) correspond to maximal hemoglobin absorption peaks and are used to highlight airway mucosal and submucosal vasculature. Blue light highlights superficial capillaries, whereas green light can penetrate deeper to highlight larger submucosal blood vessels in (Figure B).



WLB: endobronchial obstruction in the bronchus intermedius

NBI: tortuous superficial (brown) and deeper (cyan) vessels

Figure B: White Light Bronchoscopy and Narrow Band Imaging of endobronchial tumor

Clinical applications: The rationale for developing NBI relies on the fact that malignant and dysplastic lesions are characterized by abnormal angiogenesis. This can be detected visually as vessel entanglement and abnormal proliferation within the bronchial mucosa (2). Angiogenesis may be more specific for identifying intraepithelial neoplasia than mucosal thickening or changes in the extracellular matrix. Studies suggest that NBI improves detection of dysplasia and carcinoma in situ (CIS) compared with WLB (3,4). The image patterns that correlate with findings of dysplasia or CIS include dotted vessels among the increased capillary density and complex tortuous vessels (5). Progressive patterns of neovascularization (spiral and screw type vessels) correlate with progressive invasiveness (Figure B). For patients with central airway tumors, NBI can be used in combination with other imaging modalities (i.e AFB) to better define tumor extension relevant to curative intent treatment (surgical or endoscopic) (6). NBI may guide bronchoscopic biopsies by targeting the biopsy to the area of vascular changes and viable tissue rather than necrotic areas. Routine clinical use of NBI is, however, limited as of this writing, in part because the natural history of potentially premalignant lesions is not completely understood, indications have not been well established, and inter- and intra-observer reliability recognizing normal and abnormal NBI images need to be further defined.

Conclusions: NBI provides detailed images of the microvasculature patterns caused by altered angiogenesis in preneoplastic and neoplastic lesions. NBI enhances the diagnosis and characterization of mucosal lesions in the respiratory tract, and could be an adjunct technique to WLB. Standardization of image characterization, further image-histology correlation and validation, and the impact of this technology on patient outcomes are necessary before endorsing the use of NBI in the routine bronchoscopy practice. Because of its limitation to airway surface imaging, it is likely that in the near future, bronchoscopists will use NBI in a multimodal bronchoscopy platform as an adjunct to WLB, and in combination with higher resolution technologies such as CFM or OCT.

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From right to left Dr. Tengku Saifudin Tengku Ismail, Dr. Roslina Manap (President of MTS), Dr. Henri Colt, and Dr. Ahmad Izuanuddin Ismail with opinion leaders from Malaysia at the first Faculty Development Program held in Kuala Lumpur.

Education and Training

The Malaysia Thoracic Society, the Singapore Thoracic Society, and the Universiti Teknologi MARA collaborated with the WABIP to host a 2.5 day Introduction to Flexible Bronchoscopy program and Bronchoscopy Master Class (train the trainers) in Kuala Lumpur, Malaysia. During this event, program directors from Malaysia also devoted several hours to discussing how Bronchoscopy Education Project materials (including standardized didactic lectures, interactive sessions, checklists, assessment tools, the Essential Flexible Bronchoscopist© eBook, and patient-centered practical approach exercises that help participants enhance their cognitive and experiential knowledge of bronchoscopy) should be incorporated into their training programs. Opinion leaders designed an implementation plan championed by Drs. Saifudin Tengku Ismail And Dr. Roslina Manap, President of the Malaysia Thoracic Society.

A few months later, the Singapore Thoracic Society and National University Hospital hosted a similar program offering didactic lectures and hands-on simulator training to a large group of first and second year pulmonary trainees. Prior to this educational event, a full morning was devoted to discussing how Bronchoscopy Education Project materials could be incorporated into Singapore's national pulmonary training curriculum. Additionally, the group developed a plan to incorporate and study the use of assessment tools and checklists into bronchoscopy training to monitor and objectively measure learner progress.

The WABIP gratefully acknowledges program organizers Associate Professor Tengku Saifudin Tengku Ismail, Associate Professor Pyng Lee, faculty Dr. Khoo Kay Leong, Dr. Bernard Ho (president STS), Dr. Hideo Saka (Japan), Dr. Ahmad Izuanuddin Ismail, and all trainers and participants for contributing to these exciting and highly successful educational endeavors!

Dr Pyng Lee (left bottom corner) with faculty and junior trainees from teaching hospitals in Singapore gathered at a nationwide Introduction to Flexible Bronchoscopy Program.

Research

Bronchoscopic Endobronchial Ultrasound Guided Transbronchial Needle Aspiration (EBUS-TBNA) Sampling of Mediastinal and Hilar Nodes Provide Adequate Samples for Subtyping and Genotyping of Lung Cancer

Recent studies show that EBUS-TBNA samples of enlarged mediastinal and hilar nodes obtained are adequate in quantity and quality for genetic and molecular subtyping in upwards of 90% and 77% of samples respectively (1). Samples collected with this technique were found to be just as good as other sampling methods such as mediastinscopy.

Another study from Nakajima et al; shows that biopsy samples obtained from EBUS-TBNA of mediastinal and hilar nodes are sufficient for analysis of expression of thousands of genes transcripts using microarrays (2). Some of such commonly sought after genes include EGFR, k-RAS and EML4-ALK.

The information gleaned from these assays can help predict prognosis and guide personalized cancer therapy with improving outcomes.

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Tips from the Experts

Approach to Navigational Bronchoscopy

Thomas R. Gildea MD MS
Head, Section of Bronchoscopy
Respiratory Institute
Cleveland Clinic

Electromagnetic Navigation Bronchoscopy has been a common part of our practice since the first US study was conducted at our center and continues to have an important role for the diagnosis of small peripheral lung lesions (1). The next few paragraphs will describe the current state of its utilization and some of the tricks of the trade we have incorporated based on existing literature and experience.

INDICATIONS: When I approach a request for navigation bronchoscopy I must decide whether 1) a biopsy required? 2) the patient is risk adverse or unable to undergo alternative procedures such as CT-guided fine needle aspiration or primary resection, 3) bronchoscopy is warranted for mediastinal staging or implantation of a fiducial marker and 4) there are contraindications to general anesthesia.

In my center, navigational bronchoscopy is considered in inoperable/unresectable patients or those with a "clean" mediastinum, no easily approachable metastatic lesions and a specific lesion requiring diagnosis (2). If mediastinal or hilar adenopathy are noted, EBUS maybe performed prior to setting up navigational equipment.

PLANNING: I make sure the CT scan is less than one month old and in the appropriate format. The CT parameters we use are 1 mm cuts with 0.8 mm overlap with the soft tissue kernel. In my experience, lesions can resolve or patients may develop disease that is better approached using other procedures. I always plan the case myself because my ability to trouble shoot and improvise is enhanced when I am the one planning the pathway and interacting with the 3D map. I never accept the computer-generated path. Instead, I modify it extensively so that I know all the twists and turns beyond the hilum. I favor cases with a "bronchus" sign (3) but I will also attempt cases if there is an airway in line with the lesion on a tangent from the hilum.

REGISTRATION: I typically chose the Edge 45 catheter as it has great range for most cases. Under deep sedation or general anesthesia the airway is protected using a laryngeal mask airway (iGel LMA). I do an airway exam and if the lesion is in a direct path from the hilum I will use the edge45 with a peripheral EBUS probe and not attach the navigation probe until I am certain it will be used. If the lesion is located, I thus save a significant amount of money. If the lesion is distal, beyond several branches then I use the navigation system. Registration is now automated, but I usually plan out the old markers as a back-up. It is important to complete a balanced survey of the left and right lung so you don't go into more or fewer airways on either side and at the same depth. I never go beyond the segmental level of any airway. I always complete the survey and make sure the virtual airway moves similarly to the actual bronchoscopy images prior to accepting the registration. I can target more than one lesion in the same lung, but I will not sample bilaterally in the same setting because of safety concerns. When navigating, I immediately change to my target rather than working through the intermediate points. "Bright and to the right" is how we follow the pathway using the edge catheter. One trick is to pull the probe back a little to allow the bend in the Edge catheter to catch an acute branch point.

SAMPLING: I use fluoroscopy in all cases. When I have localized the lesion I bring in the fluoroscopy unit and use the radial EBUS probe to locate the lesion and confirm its location on fluoroscopy in order to mark the area. I can manipulate the Edge catheter and EBUS probe to better localize the lesion and I pay close attention to how much the catheter moves or bends when the EBUS probe and other instruments are removed from the catheter. I MIGHT adjust the depth and angle of the catheter relative to the lesion to make sure I biopsy the area located on the fluoroscopy/EBUS image. I typically use brush cytology for 2 passes, then a superTrax needle for 2-4 passes, followed by a needle brush for 1-2 passes and finally forceps biopsy (5 samples) at the end. I have the benefit of having rapid on site cytology examination available so I can attempt rebiopsy or repositioning my instruments to get more samples until I am satisfied that I have obtained representative tissue. After obtaining my specimens, I usually perform a mini wash with 5 mls of saline solution, suctioning material through the working channel and placing it into the same Cytolyte solution as my TBNA specimen (4).

QUALITY CONTROL: I try to meet with my team after each procedure to discuss the case and what might be done to increase efficiency and diagnostic yield. We have not begun to enter data about navigational bronchoscopy in the AQuIRE registry but will be done when the next iteration of the registry is running to assess benchmarking and quality indices.

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WABIP News

News from the WABIP Board of Regents Meeting

The BOR welcomes Michael Mendoza (General Manager and information technology), and Jason Tonge (Member Services) to our administrative staff. Michael's history is in finance and computer technology. Jason's is in medical writing and communications. You will find bio sketches and photos on the new and improved WABIP website at www.wabip.com!

The WABIP also welcomes several new member societies representing health care providers from Pakistan, Romania, Russia, and Peru. Our organization continues to grow. With more than 2000 members worldwide, representing more than 25 national and regional societies, the WABIP has become a truly global health care professional organization with international representation and transparent governance. Keep your eyes open for upcoming committee designations, taskforce reports, and requests for proposals for faculty development programs and introductory bronchoscopy courses, as well as new education, research, and humanitarian aid activities. The WABIP is known even at the top of the world (see photo below). If you are interested in doing volunteer medical work in Nepal, please contact our member service liaison jtonge@wabip.com.

Figure Legend: (from right to left): Michael Mendoza (General Manager, WABIP), Jason Tonge (Member Services, WABIP), Small replica of the new WABIP flag being held by Dr. Henri Colt (chairman WABIP) and Nima Sherpa (Nepali guide) at Khunde Hospital (altitude 3850 meters), founded by Sir Edmund Hillary (New Zealand mountaineer, explorer and philanthropist) in 1966, now staffed by Chief Medical Officer and Nepali hero, Dr. Kami Temba Sherpa.

Advertising

Endobronchial Ultrasound Training Course

Date: Thursday June 6th, 2013
Place: Toronto, ON, Canada
This one day hands-on course is aimed at practicing thoracic surgeons or respirologists interested in learning the technique of Endobronchial Ultrasound Guided Transbronchial Needle Aspiration Biopsy (EBUS-TBNA).
http://www.cepd.utoronto.ca/ebus/

APCB 2013: 5th Asia Pacific Congress on Bronchology and Interventional Pulmonology

Date: July 12-14, 2013

Place: Coex Convention Center, Seoul, Korea

http://www.apcb2013.org/welcome/

ICBIP 2013: International Conference on Bronchology and Interventional Pulmonology

Bangkok, Thailand -December 24-25, 2013

https://www.waset.org/conferences/2013/bangkok/icbip/

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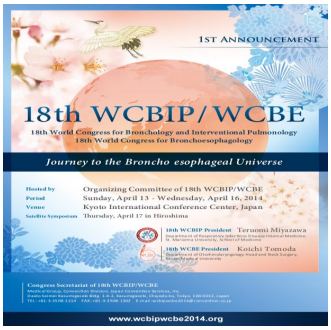
18th World Congress in Kyoto, Japan, April 2014



Links

www.bronchology.com	Home of the Journal of Bronchology
www.bronchoscopy.org	International educational website for bronchoscopy training with u-tube and facebook interfaces, numerous teachiing videos, and step by step testing and assess ment tools
www.aabronchology.org	American Association for Bronchology and I nterventional Pulmonology (AABIP)
www.eabip.org	European Association for Bronchology and Interventional Pulmonology
www.chestnet.org	Interventional Chest/Diagnostic Procedures (IC/DP) NetWork
www.thoracic.org	American Thoracic Society
www.ctsnet.org	The leading online resource of educational and scientific research information for cardiothoracic surgeons.
www.jrs.or.jp	The Japanese Respirology Society
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