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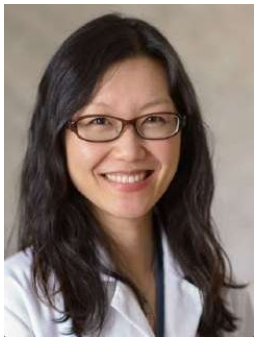
The 2023 American Association for Thoracic Surgery Expert Consensus Document on the Management of Subsolid Lung Nodules provides answers…and more questions



Jane Yanagawa, MD
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An increase in the utilization of Chest CT imaging, both for lung cancer screening and other indications, has identified an increasing number of subsolid lung nodules. Although the majority of these nodules represent benign disease, a significant number are found to be malignancies; specifically, lesions in the early spectrum of lung adenocarcinoma. Biologically, these radiographically subsolid lung cancers tend to exhibit more indolent behavior and patient outcomes are better as compared to radiographically solid lung cancers. However, these lesions can also represent invasive pathologies that have the potential to metastasize. As a result, the management of subsolid lung adenocarcinomas requires a thoughtful balance of early intervention for curable lesions while avoiding overtreatment of lesions that may never impact an individual's survival. The recently published 2023 American Association for Thoracic Surgery expert consensus document (ECD) on the management of subsolid nodules[1] aims to provide clinicians with guidelines to help with this nuanced decision-making, but also makes clear that many questions still remain.

The ECD begins with a definition of terminology, which may be one of the most important messages of the entire document. Subsolid refers to a CT-identified focal ground-glass opacity (GGO) with variable solid components within which the presence of underlying pulmonary vessels or bronchial structures remain visible, serving as an umbrella term for any lung nodule that is not considered solid. The subsolid category is then broken down into two subcategories: non-solid (also known as pure GGO) and part-solid.[1] There is significant heterogeneity in how subsolid lung nodules are described in the literature, with some broadly using the term "GGO" to refer to any subsolid lung nodule as well as those who describe subsolid lesions based on the consolidation/tumor ratio (CTR). For future research, it will be important to encourage greater uniformity in the language used to describe subsolid lung nodules for better communication and more efficient scientific progress.

Another important topic that was addressed in the ECD is the duration of surveillance for subsolid lung nodules. Studies have shown that subsolid lung nodules may remain stable for many years prior to growing in size or density. For example, Lee et al performed long-term follow up of patients that had subsolid lung nodules that were already demonstrated to be stable over the course of five years. After an additional five years of surveillance (more than 10 years in total), 13% of nodules progressed.[2] As a result, the ECD recommends that subsolid lesions that are stable for five years are followed for at least ten years. This does potentially create a long-term burden for patients, clinicians, and health systems as a whole, and increases the demand for multi-disciplinary lung nodule programs to streamline care and optimize follow-up while providing expert recommendations.[3,4] In addition, future research to discover methods of predicting lung nodule behavior over time will be critical.

The ECD also provides recommendations for the specific staging of non-solid/pure ground glass lung nodules, a topic of immediate practical importance. Studies suggest that PET/CT and Brain MRI are unlikely to play a role in the preoperative work-up of pure GGOs, which have an essentially non-existent risk for metastasis.[5,6] By extension, invasive

mediastinal staging with EBUS or mediastinoscopy is not required in this clinical scenario. Because part-solid lung nodules likely have an invasive component, the ECD recommends usual staging practices for these lesions. Whether current recommendations for lymph node dissection in quality lung cancer surgery apply to these non-solid, pure ground glass lesions will also be an important area of study in the future.

Based on the recent JCOG0802[7] and CALGB140503[8] trials, the ECD also recommends sublobar resection, when possible, for subsolid lesions that are peripheral and less than 2 cm. Lobectomy may still be reasonable for lesions that are central or greater than 2 cm, particularly when adequate margins cannot be achieved with a lesser resection. Unlike solid lesions where the aggressive biology of the disease likely carries the greatest weight in determining survival, we may find one day that the extent of local therapy actually matters the most for subsolid lesions. Focus has now turned to the question of when to perform a wedge versus segmentectomy for these lesions. In the prospective single-arm study of sublobar resection for peripheral subsolid lesions with a CTR <0.25, where the majority of patients (82%) underwent wedge resection, the investigators demonstrated an impressive 5 year relapse-free survival of 99.7%.[9] However, in a large retrospective study of wedge resections versus segmentectomy for subsolid lung nodules, Zhang et al. found that subsolid lesions with a CTR >0.5 (regardless of size) and subsolid lesions between 2-3 cm (regardless of CTR) had worse outcomes with wedge resection.[10] The controversy of wedge versus segmentectomy is just starting to be addressed.

In summary, the management of radiographic subsolid lung adenocarcinomas is not clear-cut. Due to the indolent nature of the disease and improved outcomes, our decisions carry significant weight for the well-being and quality life of our patients. The ECD aims to provide a basic framework for the approach to the majority of patients with subsolid lung nodules, but does not address all clinical scenarios. Additional clinical and translational research is needed to improve our understanding of the biology of early spectrum lung adenocarcinoma and ultimately allow more precise surveillance, diagnostic, staging, and therapeutic recommendations in the future.

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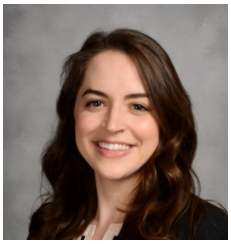
Technology Corner

Pafolacianine for Intraoperative Molecular Imaging (IMI) of lung cancer



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Introduction

The goal of the surgical oncologist is to accurately differentiate malignant tissue from benign tissue and to remove the entire cancer while minimizing the removal of non-cancerous tissue. Thoracic surgeons face unique challenges during pulmonary resections, including (1) identification of small primary, synchronous, or metachronous pulmonary lesions; (2) accurate identification of lymph nodes with cancer cells; (3) assessment of margins and differentiation of tumor from surrounding critical structures; and (4) recognition of residual disease following tumor resections. Until recently, thoracic surgeons have only had two intraoperative tools, visual inspection and manual palpation, to meet these challenges. Intraoperative molecular imaging (IMI), the use of a fluorescent dye that selectively accumulates in tumors and an imaging system to highlight the dye in the tumors, is an emerging technology to add to the arsenal of intraoperative tools. Pafolacianine, the only FDA-approved targeted near-infrared (NIR) contrast agent for lung resections, can improve identification of small lung nodules and has been shown to improve oncologic operations.

Background

MI utilizes a targeted fluorescent molecule that is injected into the patient, localizes to the tumor, and then a wavelength-specific camera system is used to detect the fluorescence in the cancer. Fluorescent dyes emit light in a range of wavelengths, from ultraviolet (UV) to infrared. Dyes with emission in the NIR range (700-1000nm) have decreased autofluorescence and increased depth of penetration compared to dyes in the visible light spectrum and an improved safety profile over UV dyes. IMI can identify as few as 10^4 cancer cells and can locate nodules as small as 0.5mm in laboratory conditions.

Dyes with tumor-specific accumulation allow identification without a priori knowledge of the presence or location of the cancer. Pafolacianine, a folate analogue conjugated to the NIR dye S0456, is a fluorescent imaging agent that binds folate receptor (FR) with approximately 1nM affinity. Folate receptor (FR) is overexpressed on 85% of lung malignancies. The dye can be administered 2 to 12 hours prior to surgery, and the Stryker 1788, a commercially available thoracoscope, can detect the tracer. Clinical trials have shown safety and minimal toxicity.

Clinical Application

Surgery for pulmonary malignancies is challenging in several ways, including detection of synchronous or metachronous disease, localization of small nodules, and margin assessment. These challenges have become even more relevant with the increased use of video assisted and robotic assisted thoracoscopic surgery, now used in approximately 40% of cases, further limiting surgeons' ability to perform manual manipulation. In a multi-institutional Phase II study, IMI with pafolacianine improved outcomes for 26% of patients undergoing pulmonary resection for NSCLC, either by identifying synchronous lesions, localizing nodules, or assessing margins, demonstrating that IMI is a useful adjunct for pulmonary resections.

In the multi-institutional, randomized Phase III ELUCIDATE Trial, 53 of 100 patients who were randomized to IMI with pafolacianine (53%) experienced at least 1 clinically significant event, namely identification of synchronous lesions, localization of primary nodules, and/or margin assessment. The most frequent clinically significant event was the identification of a close margin. Identification of an otherwise undetectable primary nodule occurred in 19% of participants.

If a synchronous lesion is missed during surgery, it may be difficult to identify on surveillance scans due to postoperative scars, effusions, and atelectasis. Identification of synchronous or metachronous lesions may upstage the patient, and in some cases may change the need for adjuvant therapy. Improved intraoperative identification of these synchronous lesions by IMI provides an opportunity for improving long-term survival.

Localization of small nodules may be challenging intraoperatively with inspection and palpation alone, especially with ground glass opacities which often lack visible structural changes. IMI increases surgeon confidence in localization of primary nodules, thereby avoiding unnecessarily increasing in the scope of the operation.

Rapid back-table margin assessment with IMI typically takes less than 2 minutes, while frozen section requires approximately 25 minutes. Positive surgical margins have enormous oncologic implications, including increased risk of mortality. The immediate feedback provided by IMI in the clinical trials increased surgeon confidence when close margins were a concern, particularly in the case of ground-glass opacities which often display subtle or no changes.

Discussion

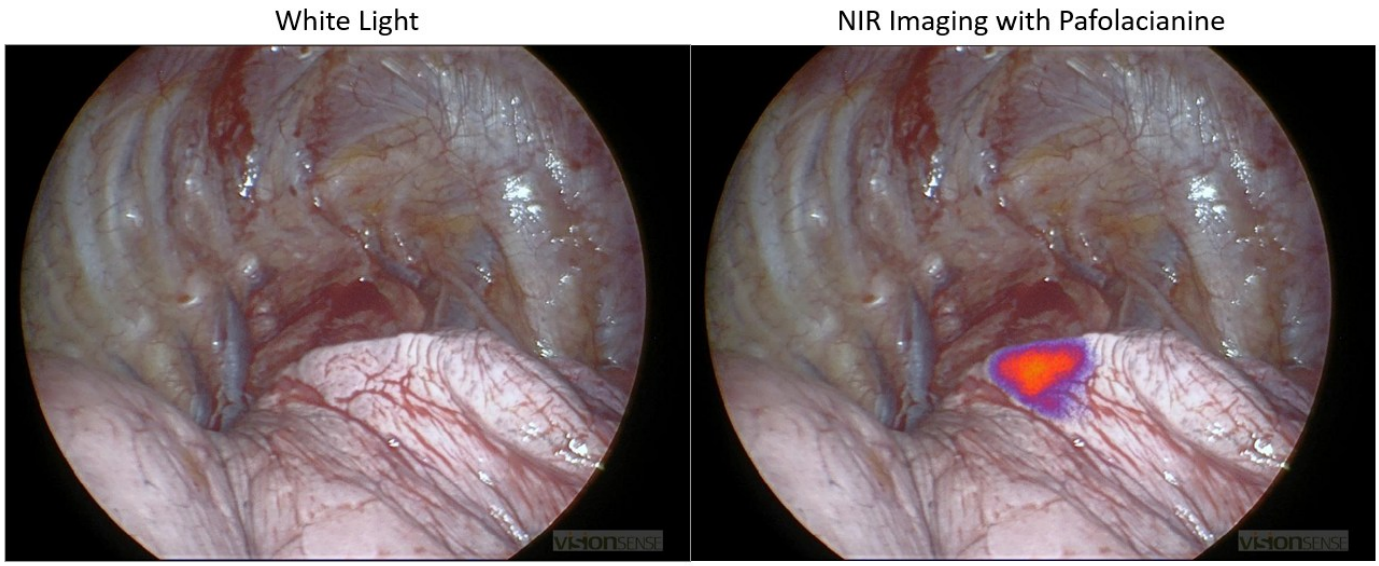
IMI is a new tool for the surgeon in thoracic surgical oncology. Multiple clinical trials have shown IMI with pafolacianine improves outcomes for patients undergoing pulmonary resection for NSCLC, thus this agent is a useful adjunct for pulmonary resections.

A targeted NIR contrast agent, pafolacianine, improves identification of small lung nodules compared to other fluorescent dyes by specifically targeting pulmonary adenocarcinomas and other FR-expressing tumors. Pafolacianine is particularly helpful in identifying sub-centimeter primary, synchronous, or metachronous pulmonary lesions, which are not typically identified on preoperative FDG-PET. A significant number of patients have their disease upstaged with the addition of IMI with pafolacianine. Without IMI, these patients would not receive appropriate adjuvant treatment due to failure to identify synchronous disease.

One of the major limitations of IMI is depth of penetration. Dyes that fluoresce in the visible spectrum only penetrate through a few millimeters of tissue, while NIR dyes have a 1–2 cm maximum depth of penetration. Advances in fluorescent probes and cameras targeting the short-wave infrared imaging (950-1400nm) may improve the depth of penetration in IMI in the future. There is decreased tissue scatter and auto-fluorescence at these wavelengths, which improves detection of smaller, deeper tumors in animal models.

In conclusion, IMI with pafolacianine for thoracic malignancies significantly improved oncologic outcomes. More phase III trials are needed to determine IMI impact on patient outcomes and overall clinical value. Future research will involve the development of drugs targeted to other receptors that are upregulated in thoracic malignancies. As more fluorescent dyes are developed, the use of a cocktail of imaging agents may provide a rapid intraoperative diagnosis, decrease the total operative time, decrease the rate of conversion to open procedures, and facilitate a more complete oncologic surgery. IMI is applicable to all solid tumors and will be increasingly utilized as new tumor-specific fluorescent contrast agents are developed and the sensitivity and accessibility of commercially available imaging systems continues to improve**.**

Figure: Pafolacianine identifies pulmonary malignancies with intraoperative imaging techniques, providing real-time feedback for the thoracic oncologic surgeon, as shown by the representative case.



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Nodule localization for Minimally Invasive Surgery

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Introduction

Due to application of broader screening guidelines, increased bronchoscopic biopsy accuracy, and increased application of endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA), we should expect an increase in earlier stage non-small cell lung cancer (NSCLC) diagnoses. While video-assisted thoracoscopic surgery (VATS) is the preferred surgical approach for pulmonary nodules ≤ 30 mm many factors including nodule density, size, and pleural depth can predict unacceptable rates of surgical detection failure (1). Furthermore, for NSCLC lesions ≤2 cm in size with N0 disease sub-lobar resection has been shown to be non-inferior in disease free survival when compared to lobectomy (2). Patients previously deemed too debilitated for a definitive resection may now be eligible for surgery and as such precise localization will become more critical in the coming years.

Previously standard of care for preoperative lung nodule marking included CT-guided transthoracic needle marking (CT-gTTN). Several types of marking exist in this regard including percutaneous hook wire, coil placement, and dye marking. While there are no direct comparison of all modalities , several studies have demonstrated similar success rates and procedural time regardless of modality selected. Unfortunately, these approaches all share a similar incidence of pneumothorax rate and hemorrhage with the highest occurrence in CT-guided hook-wire placement (3). Additionally, while intraprocedural time is limited, patients often undergo repeat anesthetic events for each phase of care. Diagnosis, followed by marking, followed by surgery is a near certainty with this method, resulting in delays and complexity of care.

Robotic assisted bronchoscopy (RAB) or electromagnetic navigation (EMN) in conjunction with real time image guidance are new minimally invasive approaches. Where previously patients with small, peripheral, or ground glass nodules were previously not candidates for EMN or RAB-marking, newer robotic platforms and real time image correction have helped overcome CT-to-body divergence. Recent studies have exhibited comparable surgical resection success to CT-guided transthoracic biopsies (4). Furthermore, the integration of primary lesion diagnosis, mediastinal staging via EBUS-TBNA, localization, and subsequent sublobar resection into a single procedural setting theoretically will minimize the interval between initial clinical presentation and definitive surgical intervention.

Indications:

RAB-nodule localization should be considered for patients with nodules with a high likelihood of intraoperative identification difficulty. Nodules characteristics which increase visualization and palpation difficulty include those that are sub-centimeter, greater than 10mm from the closest pleural surface, and non-solid nodules (1, 5). Additionally, those planned for sub-lobar resection or where multiple resections are consecutively considered would benefit from RAB-nodule localization due to its increased safety profile when compared with CT-gTTN. As a result, patients who have undergone previous surgical lung resections or with abnormal pulmonary function tests should be viewed as potential candidates.

Planning

We perform robotic bronchoscopic biopsy utilizing one of several RAB platforms currently on the market. Pre-procedural planning and navigation is completed using a pre-procedure thin-slice CT scan of 1mm or less ideally collected as close to the procedural data as feasible. This allows for a more representative 3D reconstruction of the patients' airways, pleural borders, and target lesion, improving safety as well as accuracy of target mapping. For nodules within 20mm of the pleural border, a virtual target within the 3D planning software will be made at the lesion. For nodules greater than 20mm from the pleural border, a superficial virtual target will be made at 10mm from the closest pleural border. The interval between RAB-marking and resection is crucial in selecting between dye and fiducial placement as dye marking loses visualization efficacy after 24 hours (6). For deeper and ground glass lesions pre-procedural collaboration with the performing thoracic surgeon is critical to ensure appropriate approach and margins are selected based on the ideal surgical plan.

Sampling/Technique:

Suggested Dye Marking Mixture

25 mg ICG dye reconstituted in 10mL sterile water. 10mL of methylene blue can be optionally added if felt beneficial by collaborating surgeon.

Single Event Marking

In cases where the nodule has already been pathologically confirmed, navigation, using standard technique, is employed utilizing pre-procedural airway planning to navigate within 30mm of the pre-procedural virtual target. If available, several intraoperative technologies including rEBUS, augmented fluoroscopy, and cone beam CT (CBCT) can be utilized to overcome CT-to-body divergence. Once confirmation of the marking target has occurred the RAB bronchoscope is positioned approximately at 10mm from the virtual target. A 21g needle is primed with indocyanine green (ICG) and methylene blue mixture. Following this the needle is deployed under fluoroscopic guidance and direct contact of the needle with lung parenchyma is visually confirmed. Once the needle is confirmed in satisfactory position, 0.3mL of the dye mixture is injected. Further markings are completed if required after no intraprocedural pneumothorax is confirmed with real time imaging (i.e. fluoroscopy, CBCT). Following successful marking, the patient is prepared for surgical resection by airway exchange to double-lumen tube and thoracic surgery team proceeds with resection. 10mL of methylene blue can be added, which is visible to the naked eye, allowing for localization even if robotic surgery cannot be performed due to technical challenges (Fig. 1a-b).

Staged-Event Marking

When the diagnosis of the nodule is uncertain, and resection will be completed in staged fashion, a fiducial marker can be placed for a more durable indicator. Following navigation and malignancy confirmation via rapid on site cytologic evaluation, we proceed with fiducial placement. To complete this, we typically create a ICG dye mixture of 25 mg ICG dye and 10mL sterile water. At this point, 0.5mL of this mixture will be injected into a Cook Tornado Coil (Cook Medical LLC, Bloomington, IN, USA) for 15 minutes to allow absorption unto the coil fibers. Finally, we load the Cook Tornado Coil into a delivery catheter. Deployment is completed in a similar fashion to single-event marking described above under fluoroscopic guidance (Fig. 1c-d).

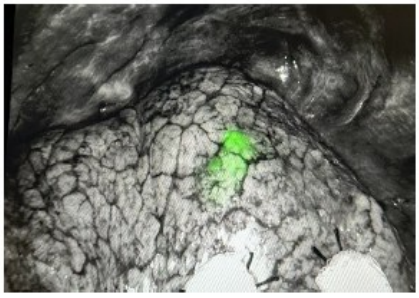
Quality control:

RAB-nodule localization increases the technical expertise required for a successful and time-efficient procedure. As a result, bronchoscopists and thoracic surgeons should undergo formal training with the intended platform prior to implementation. Furthermore, visualization of ICG marking requires Firefly fluorescence imaging system (da Vinci Fluorescence Imaging Vision System) or equivalent system. While ICG is routinely used, the proceduralist should be aware of the small possibility for allergic reaction, and this should be evaluated for during pre-procedural consultation. While a significantly safer risk profile for RAB-nodule marking than CT-gTTN marking, the potential for pneumothorax (0.5% vs 14%, $p<0.001$) and bleeding (4.1% vs 15.4%, $p=0.005$) still exists and should be monitored for prior to case termination and patient disposition (4).

Conclusion

RAB-nodule localization offers a minimally invasive approach for pre-operative localization of challenging pulmonary nodules, particularly for sublobar resections in early-stage lung cancer patients. Using advanced imaging and navigation, RAB allows for precise dye or fiducial marker placement, and can even be combined with diagnostic procedures like biopsy and mediastinal staging, within a single procedure. This technique demonstrates a superior safety profile compared to traditional CT-guided percutaneous marking, reducing risks of pneumothorax and hemorrhage while streamlining the time from diagnosis to surgical intervention.

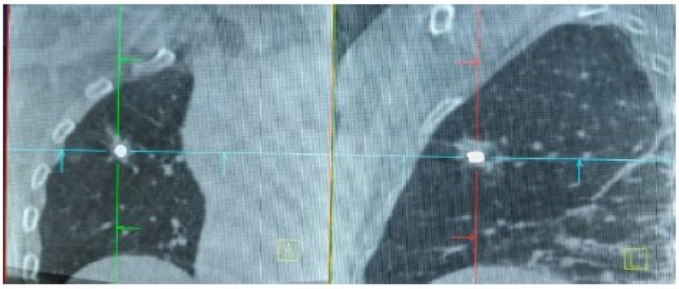
Figure 1. Methods of Deep Nodule Marking



a) ICG marking Under Fluorescence Imaging System

b) Methylene Blue Dye Marking Under White Light

c) ICG Soaked Fiducial of Under Fluorescence Imaging System



d) CBCT Spin of Fiducial Marking of Nodule

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The Interventional Pulmonology Institute

Happy Birthday

Written by : Ömer Ayten, Cengiz Özdemir, Levent Dalar, and Ali Musani

The World Association for Bronchology and Interventional Pulmonology (WABIP) is a nonprofit organization with 60 Interventional Pulmonology (IP) societies and 10,500 members dedicated to education and training in bronchoscopy and IP worldwide. For the last few decades, WABIP has played a significant role in raising the expertise in bronchoscopy and IP through workshops, webinars, global conferences, and numerous educational products.

However, despite these efforts, the IP field remains nonexistent or primitive in large parts of the world, except in Western countries and a few Asian countries with access to advanced technology, formalized training, and resources. IP training, resources, and infrastructure are unavailable in many countries, especially those with lower socio-economic status. As a result, much of the world's population cannot benefit from the diagnostic and therapeutic advances in pulmonary medicine. Doctors from developing countries face insurmountable barriers in pursuing IP training, such as pre-certification in medicine or surgery and pulmonary and critical care, local licensure, and malpractice insurance to train in countries with well-established IP and IP training programs. Short courses and informal observerships or apprenticeships, once the only viable options for training, have become increasingly unfeasible due to various reasons, including host countries' policies for international doctors, visa restrictions, language barriers, and financial constraints.

In response to these challenges, WABIP introduced a unique concept by combining multinational for-profit and nonprofit organizations to provide state-of-the-art training to doctors worldwide. The training includes a didactic and hands-on curriculum developed by world leaders in IP under the auspices of WABIP. This fellowship is offered at private and government hospitals in Turkey, Greece, Italy, and Spain. The partnership provides multicenter simulation and hands-on and didactic training. After months of intense training, a didactic and hands-on certification examination is conducted by the International faculty of the WABIP before granting a certificate of completion to the fellows.

This program was formalized in April 2023 under the Interventional Pulmonology Institute (IPI). Dr. Ali Musani was named the first Chair of the Institute, acknowledging his vision and tireless efforts in establishing the institute. Dr. Levent Dalar was named the first Director of the IPI-Istanbul, where he has been instrumental in developing the institute, its educational mission, and its day-to-day operation.

The IPI is housed in LIV Hospital Vadi Istanbul, which generously provided WABIP with the space, instruments, training facilities, and institutional privileges for trainees to treat patients under supervision. The Istinye University, Istanbul, accredits the IPI. The quarterly fellowship started in October 2023 and received four times as many applications as the available training spots worldwide. These applications are reviewed by a dedicated international faculty led by Professor Javier Flandes from Spain. One of the primary criteria for selecting trainees includes whether there is a center in their country where they can establish an IP center to practice the procedures learned during IPI training. Additionally, the selection committee considers the trainees' potential to start training programs in their own countries, thereby benefiting their communities by elevating the level of healthcare.

The selected doctors undergo a three-month training program that includes online theoretical lessons provided by experienced WABIP doctors, simulation training in Florence, Italy, and Athens, Greece, and hands-on and case-based training at various hospitals in Turkey. The Turkish hospitals were chosen for their extensive experience in IP, including Liv Vadi Istanbul Hospital, Yedikule Chest Diseases and Thoracic Surgery Hospital, Kartal Training and Research Hospital, Eskişehir Osmangazi University Hospital, Gülhane Training and Research Hospital, Sultan Abdulhamid Han Training and Research Hospital, and Ankara Atatürk Sanatorium Training and Research Hospital. The multi-institutional training allows trainees to observe a wide

variety of cases and approaches by different physicians. At the end of the training period, those who pass a theoretical and practical examination under the supervision of WABIP-appointed examiners receive a certificate from WABIP-IPI confirming the completion of their training.

So far, six doctors from Ecuador, South Africa, India, Bolivia, and Iraq have completed their training and have begun performing these procedures in their countries, benefiting the local population. Currently, two doctors from Libya and Malaysia are undergoing training. The IPI has already selected ten doctors out of 86 applicants from Ghana, Peru, Philippines, Sudan, Egypt, Pakistan, Ethiopia, Lebanon, and Kenya for training in 2025.

The IPI program is a nonprofit educational initiative created solely to serve humanity. Therefore, IPI-WABIP, the institutions, organizations, and instructors providing the training do not receive any financial gain from this program. The training is entirely based on service to humanity and voluntary participation. Instructors selflessly dedicate their valuable time, knowledge, and experience to train doctors without seeking any personal benefit. The IPI expenses and scholarships provided to each fellow are funded by the generous support of industry partners Vathin Medical Instrument Co. Ltd and Olympus Corporation. We thank the faculty, committee members, and leadership of IPI and WABIP for contributing to this educational program's creation and continuation.

WABİP Fellow Selection Committee

Dr. Javier Flandes (Chair) – Spain
Dr. Ali Musani -USA
Dr. Shaheen Islam – USA
Dr. Levent Dalar – Turkey

International Faculty (Weekly Zoom Lectures)

Dr. Ali Musani -USA
Dr. Grigoris Stratakos – Greece
Dr. Lorenzo Corbetta – Italy
Dr. Stefano Gasparini – Italy
Dr. Sujith Cherian – USA
Dr. Javier Flandes – Spain
Dr. Daniela Gompelmann – Austria
Dr. Hervé Dutau – France
Dr. Muzaffer Metintaş – Turkey
Dr. Mohammad Munavvar -UK
Dr. Tudor Toma – UK

Local Faculty from Turkey who train IPI fellows at their hospitals with hands-on training


Dr. Muzaffer Metintas

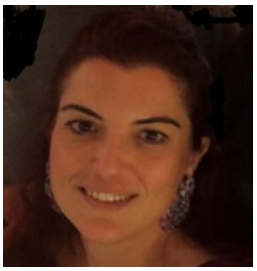

Dr. Aydın Yılmaz

Dr. Guntulu Ak


Dr. Sevda Sener Comert

Humanitarian News

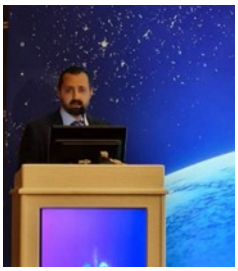
Dr. Cengiz Ozdemir



Dr. Sinem Nedime Sokucu

Dr. Ayperi Ozturk

Dr. Deniz Dogan



Dr. Ömer Ayten

Dr. Kadir Canoglu

Dr. Demet Turan

Dr. Efsun Gonca Chousein

Signing ceremony for the first Interventional Pulmonology Institute (IPI) between World Association for Bronchology and Interventional Pulmonology (WABIP) and LIV Vadi Hospital, Istanbul
Dr. Adil Tanık (Medical Director of LIV Vadi Hospital), Dr. Levent Dalar (Director of IPI), Dr. Ali Musani (Chair of IPI), Meri Istiroti (CEO of LIV Hospital Group), Dr. Mehmet Akif Benk (General Manager of LIV Vadi Hospital)

Humanitarian News

IPI Advanced Diagnostic and Therapeutic Bronchoscopy Inaugral Course 2023, Istanbul
From right to left: Dr. Levent Dalar (Turkey), Dr. Grigoris Stratakos (Greece), Dr. Mohammad Munavvar(UK), Dr. Lorenzo Corbetta(Italy), Dr. Ali Musani(USA), and attendees

Hands-on medical thoracoscopy training at Osmangazi University Hospital/Eskisehir
Dr. Guntulu Ak, Dr. Wan Jen Lye)

Humanitarian News

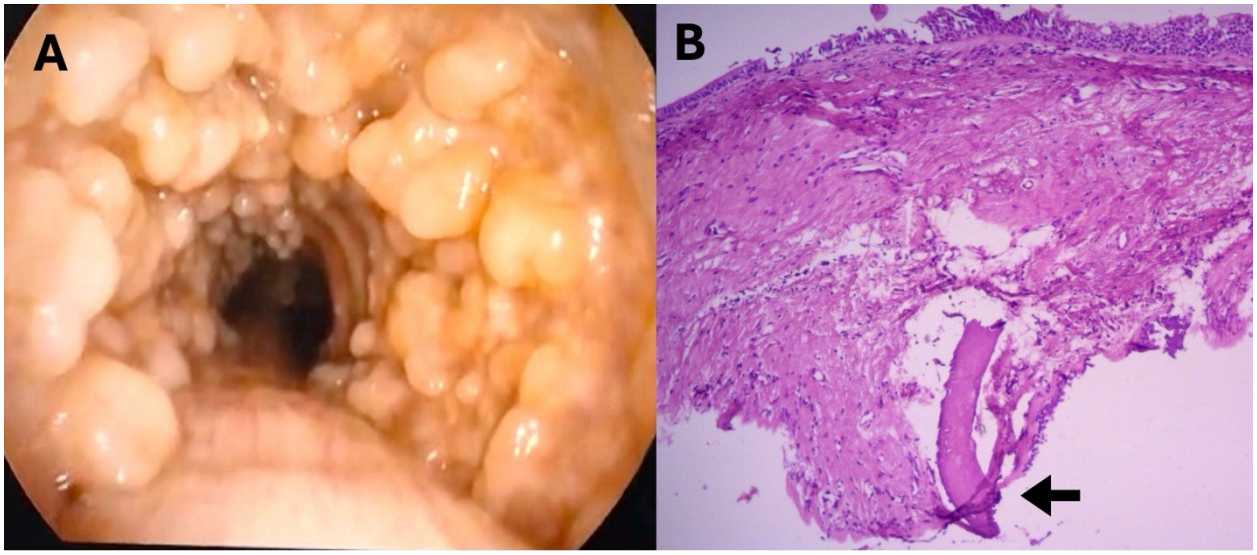
IPI practical exam based on a real case at LIV Vadi Hospital/Istanbul
(From left to right: Dr. Levent Dalar (IPI Istanbul Director), Dr. Stefano Gasparini (international examiner-WABIP), Dr. Shaun Maasdorp (IPI fellow), Dr. Omer Ayten (faculty), Dr. Melvy Apaza (performing procedure-IPI fellow)

Hands-on EBUS training at Atatürk Sanatorium Training and Research Hospital /Ankara
(From left to right: Dr. Housnia Jaballah Soudani(IPI fellow), Dr. Ayperi Ozturk(faculty), Dr. Wan Jen Lye (IPI fellows)

Rigid bronchoscopy training on a mannequin at LIV Vadi Hospital /Istanbul
(Dr. Shaun Maasdorp)

Best Image Contest

WABIP Best Image Contest 2025



Central Airway Diseases

A 60-year-old male with no significant medical history underwent a chest computed tomography (CT) scan for the investigation of a persistent cough, which revealed nodular calcifications insinuating into the tracheal lumen. Further investigation with bronchoscopy revealed multiple sessile nodular lesions with spiculated, hardened consistency, covered by smooth mucosa and projecting into the airway lumen (resembling stalactites), involving the entire anterior and lateral walls of the trachea while sparing the posterior wall (Panel A). These findings are hallmark features of Tracheopathia osteochondroplastica. Histological analysis of the biopsy confirmed the diagnosis, demonstrating intact respiratory epithelium with submucosal ossification (Panel B). The patient has remained oligosymptomatic during subsequent follow-ups, with no recorded complications.

Credits / Image courtesy of

Dr. BIANCA FIDELIX ESPINDULA

This image is 1 of 3 selected among 100+ submissions to our Best Image Contest held in late 2024. Our next Image Contest will open later this year. We look forward to receiving your image submissions.

WABIP News

A Resounding Success: WCBIP/WCBE 2024 Ignites Bali with Innovation and Collaboration

The 23rd World Congress for Bronchology and Interventional Pulmonology / World Congress for Bronchoesophagology (WCBIP/WCBE) in conjunction with the 17th National Congress of the Indonesian Society of Respirology (ISR) concluded on a high note, leaving a lasting impression on the global bronchology community. Held from October 23-27, 2024, at the Bali Nusa Dua Convention Center, the congress embraced the theme "A Magical Blend of Learning: Science, Culture, and Nature," perfectly encapsulating the unique experience offered to attendees. The 23rd WCBIP/WCBE itself was held between October 23-25, 2024.

Under the leadership of Congress President Prof. Menaldi Rasmin, and expertly organized by The Indonesian Society of Bronchoscopy and The Indonesian Society of Respirology, WCBIP/WCBE—ISR 2024 attracted a remarkable **2,123** participants. The event was a hub of knowledge exchange, featuring a diverse program that included workshops and a symposium. The WCBIP/WCBE Workshop drew 297 participants, while the WCBIP/WCBE—ISR 2024 Symposium saw an impressive attendance of 1640. An additional 186 participants engaged in the ISR Workshop.

A Global Gathering of Experts

The congress benefited from the insights of a distinguished Scientific Advisory Board, including Stefano Gasparini (Italy), Atul C Mehta (USA), Gary Lee (Australia), Henri Colt (USA), Herve Dutau (France), Hideo Saka (Japan), Jamalul Azizi (Malaysia), Philippe Astoul (France), Rita Rogayah (Indonesia), and Sita Laksmi Andarini (Indonesia).

The International Scientific Officers, comprising Masahide Oki (Japan), Septimiu Murgu (USA), Semra Bilaceroglu (Turkey), Kaid Darwiche (Germany), David Hsia (USA), Philip Emmanouil (Greece), Lina Zuccatosta (Italy), Fraser Millar (Scotland), Jamsak Tscheikuna (Thailand), Jamalul Azizi (Malaysia), and Hari Kishan (India), further enriched the scientific discourse.

Showcasing Cutting-Edge Research

The congress received a total of 535 abstract submissions, with 430 accepted for presentation. The quality of research presented was exceptional, highlighting the significant advancements in bronchology and interventional pulmonology. Of the 82 accepted oral presentations, 66 were delivered (80.5% attendance), and 281 of the 348 accepted poster presentations were showcased (80.8% attendance).

WABIP News

Recognizing Excellence

The WCBIP/WCBE Oral and Poster Presentation Awards celebrated outstanding contributions to the field. The following individuals were recognized for their exceptional work:

WCBIP/WCBE Oral Presentation Awards:

- Junfeng Huang (China)
- Karin Klooster (Netherlands)
- Daniel Sterman (United States)
- Hayoung Seong (South Korea)
- Indalecio Carboni Bisso (Argentina)

WCBIP/WCBE Poster Presentation Awards:

- Belgundi Preeti Vidyasagar (India)
- Daragh Crowley (Ireland)
- Kemas Rakhmat Notariza (Indonesia)
- Long Liang (China)
- Ales Rozman (Slovenia)

WABIP Awards

- The WABIP Awards honored distinguished individuals for their lifetime achievements and contributions to the field:
- The Gustav Killian Centenary Medal: Hideo Saka
- The WABIP-Dumon Award: Jamalul Azizi Abdul Rahaman
- The WABIP Distinguished Regent Award: Lamiya Chrif Morand

Video Festival Highlights

The Video Festival showcased innovative techniques and compelling case studies. The winners in each category were:

- Best Scientific Content: Dr. Yen Shen Wong - "Malignant Central Airway Obstruction in Pregnancy"
- Best Innovation: Dr. Viswesvaran Balasubramanian - "Bronchoscopic recanalization of complex complete tracheal stenosis with Montgomery t-tube insertion and follow up – A case study"
- Best Imaging: Dr. Viswesvaran Balasubramanian - "Bronchoscopic closure of post lobectomy bronchopleural fistula with atrial septal occlusive device – A case report"
- Best Overall: Dr. Viswesvaran Balasubramanian - "Bronchoscopic Recanalization of Complex Complete Tracheal Stenosis with Montgomery T-Tube Inser"

A Legacy of Progress

WCBIP/WCBE - ISR 2024 in Bali was a resounding success, fostering collaboration, showcasing groundbreaking research, and recognizing excellence in the field of bronchology. The congress has undoubtedly left a lasting legacy, inspiring continued progress and innovation in the years to come. The WABIP extends its heartfelt congratulations to all awardees, presenters, and participants for making this event a truly memorable one. We look forward to building upon this success at future con-

Research

Bronchoscopic Lung Volume Reduction: It's a Process, Not an Event

Ali I. Musani MD, FCCP
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Treating emphysema with Bronchoscopic Lung Volume Reduction (BLVR) techniques, such as endobronchial valves, is one of the most complex procedures performed by interventional pulmonologists. While the technical aspect of deploying valves in preselected airways may not demand significant expertise, the procedure becomes intellectually challenging due to the extensive pre-operative workup required, the post-operative evaluation of outcomes, and the management of complications. This challenge is further amplified by the elderly and inherently ill patient population.

Initially, the advent of BLVR was met with high expectations. Many assumed that bronchoscopy schedules would be filled with BLVR procedures and that most patients would experience dramatic symptom improvement following a relatively simple intervention. Early concerns focused primarily on the risk of pneumothorax, expected to occur in about a quarter of cases. However, reality proved more nuanced.

Despite severe COPD being prevalent, most patients are not suitable candidates for BLVR due to comorbidities like pulmonary hypertension, bronchiectasis, asthma, and other cardiopulmonary diseases. Even in patients who undergo the procedure after rigorous pre-operative evaluation, not all develop target lobe atelectasis or show symptomatic and objective improvements.

Recently, multiple publications in the Journal of Bronchology and Interventional Pulmonology (1,2) have highlighted the nuances of interpretation of pre-operative testing, namely echocardiogram for the diagnosis of Pulmonary Hypertension (PH) and dealing with the lack of immediate lobar collapse/atelectasis and subjective and objective improvement.

Studies like these are critical in adopting novel technologies and allow for a refinement of understanding the physiology and pathology of the disease and expected outcomes with interventions. The lack of such longitudinal critical analyses of factors involved in the "perceived" failure of the procedure poses a threat to the novel technologies.

Research

In one of the publications (1), the authors discuss echocardiography as the initial screening tool for PH and the Right Ventricular Systolic Pressure (RVSP) used as the surrogate for the Mean Pulmonary Artery Pressure (mPAP) measured by Right Heart Catheterization (RHC). An RVSP cutoff value of 45mm Hg was used for BLVR. Patients above an RVSP of 45 have been rejected for BLVR, assuming their mPAP is above 40 mm Hg. Echocardiography interpretation is often questionable and erroneous in patients with severe pulmonary diseases like COPD. Many previous studies in PH have shown that in group three, PH patients, the correlation between the RVSP measured on echocardiography and PAP on RHC is the weakest. Many patients are denied BLVR if their RVSP is greater than 45, which often is their last hope if they are not a candidate for a lung transplant. Mahajan et al. raise a great point and question the validity of the cutoff of 45 RVSP on echocardiography in severe COPD patients. Their cohort of more than 450 patients shows that in 88% of patients with RVSP above 45, the mPAP on RHC was acceptable (<40 mm Hg) for BLVR. Hence, echocardiography is not a good test for establishing PH in patients with severe COPD. It may be a good test to rule out significant PH when RVSP is under 45, but it is not a good "rule in test" for significant PH when RVSP is greater than 45. Anyone with RVSP above 45 should be offered an RHC before denying BLVR.

Another publication by Mahajan et al. l (2) discusses the troubleshooting of the lack of immediate atelectasis after BLVR. It is a relatively common multi-factorial problem that requires a very thoughtful analysis. The factors involved in the lack of immediate atelectasis could include valve migration or poor placement and unidentified or new collateral ventilation, to name a few. This study reviews the incidence and outcomes of revision bronchoscopies in patients who lost or never achieved target lobe atelectasis following BLVR (20% of all BLVR patients). The study found that air leaking around the valves, either improper sizing or a change of the airway configuration after valve placement, was the most crucial reason for the inability to achieve atelectasis or loss of atelectasis. When these issues were resolved with another bronchoscopy and valve placements, 70% of these patients successfully developed target lobe atelectasis.

This study lends credence to the concept of BLVR being a process, not a one-and-done procedure. In case of failure to attain or maintain target lobe atelectasis, a thorough workup including repeat CT chest, post BLVR analysis (StratX), bronchoscopy should be considered, and valve replacement should be considered if indicated.

The above studies show that BLVR is a complex process that requires a thoughtful and analytical approach to patient selection and post-procedure management of apparent failure to achieve the goal of immediate atelectasis of the target lobe. Management of complications of the procedure, such as persistent pneumothorax and its attendant issues, should be handled with a multispecialty team of IP and thoracic surgery.

References:

1. Mahajan AK et al. J. Bronchol. Interv. Pulmonol.2025 Jan. 32(1):e0997
2. Mahajan AK et al. J. Bronchol. Interv. Pulmonol. 2025 Jan. 32(1):e1002

WABIP ACADEMY- WEBCASTS

The WABIP has started a new education project recently: *THE WABIP ACADEMY.* The WABIP Academy will provide free online webcasts with new and hot topics that will interest pulmonologists and interventionalists.

Current webcast topic: **Tissue acquisition for biomarker directed therapy of NSCLC**

You can reach these webcasts by using this link: http://www.wabipacademy.com/webcast/

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
sites.google.com/site/asendoscopiarespiratoria/	Asociación Sudamericana de Endoscopía Respiratoria

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*BF-UC190F and/or BF-UC290F are not available in some areas.

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