

CHEST-01

Assessment of the Lung Using Transthoracic Ultrasound

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Advancements in imaging capacities and the development of transducers have made transthoracic ultrasonography a useful diagnostic tool for evaluating various thoracic diseases, including pleural diseases and peripheral subpleural lung tumors. Furthermore, ultrasound-guided transthoracic real-time needle aspiration biopsy (UTNAB) has proved to be a reliable and safe diagnostic modality in several thoracic diseases. UTNAB has been routinely performed in the chest ultrasound unit at National Taiwan University Hospital for the past 30 years.

Nevertheless, the heterogeneity within lung cancer may decrease the yield rate of UTNAB. To prevent performing UTNAB into the necrotic parts or obstructive pneumonitis of the malignancy, including on-site examination of imprint cytology, color Doppler ultrasound imaging, and ultrasound elastography.

Ultrasound elastography has been intensively employed to image the liver, thyroid, and breast diseases with promising results. In pulmonology, pleural diseases have been assessed by pleural 2D shear-wave elastography (SWE), mediastinal nodal metastasis by strain elastography, and subpleural lung lesions by acoustic radiation force impulse (ARFI) strain imaging and point SWE. This presentation will address the predictive value of transthoracic 2D-SWE in differentiating malignant from benign subpleural lung lesions.

CHEST-02

Assessment of the Lymphadenopathy Using Transthoracic Ultrasound

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Lymphadenopathy is a common presentation of pulmonary disease. Lymphatic drainage from thoracic field travels from mediastinum, to neck and converges into thoracic duct. To approach superficially-located lymph nodes, ultrasonography plays as a convenient and non-invasive modality for investigation.

Unveiling accurate sites of disease involvement may guide treatment decision. Protocolized workup will facilitate a comprehensive assessment and minimize inter-observer variation. In this session, we will demonstrate the commonly-adopted scanning techniques for detailed examination. Lymphadenopathies of different etiologies and their classic echographic features will be briefly introduced, including conventional ultrasound and the innovated elastography. Echographers or clinicians will learn to differentiate the normal lymph nodes from the abnormal. After recognizing the most possible culprit, invasive procedure, such as aspiration/biopsy, will be targeted toward the lesion of interest. Some novel interventional approach to tackle with the challenging cases will be discussed.

CHEST-03

Assessment of the Diaphragm using Diaphragm Ultrasound

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A review of the role that diaphragm ultrasound can play in patient assessment in critical care or at the bedside. Parameters that can be measured include diaphragm displacement as well as diaphragm thickening index. Diaphragm ultrasound measurements can be used to monitor its function, detect patient ventilator asynchrony, as well as predict successful weaning from mechanical ventilation

CHEST-04

Introduction of Endobronchial Ultrasound

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Endobronchial ultrasound (EBUS) has revolutionized the diagnostic approach to pulmonary diseases, offering a minimally invasive method to obtain tissue samples from mediastinal and hilar lymph nodes as well as peripheral lung lesions. This technique integrates real-time ultrasound imaging with bronchoscopy, allowing for precise guidance of transbronchial needle aspiration (TBNA). The introduction of EBUS has significantly improved the diagnostic accuracy for various conditions, including lung cancer staging, sarcoidosis, and other granulomatous diseases, while minimizing the risks associated with more invasive procedures like mediastinoscopy. The evolution of EBUS technology and its application in clinical practice underscores its vital role in modern pulmonology. This abstract provides an overview of the principles of EBUS, its clinical indications, and its impact on patient outcomes.

CHEST-05

Assessment of the Benign Disease Using Endobronchial Ultrasound

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Endobronchial ultrasound (EBUS) is a valuable tool for assessing benign diseases within the respiratory system. This presentation explores the role of radial probe EBUS and EBUS-guided transbronchial needle aspiration (EBUS-TBNA) in diagnosing and evaluating benign conditions. Radial probe EBUS provides high-resolution images of the

bronchial wall and surrounding structures, aiding in the precise identification of benign lesions such as granulomas, hamartomas, and inflammatory nodules. It is particularly effective in visualizing peripheral lung lesions and offering real-time guidance for biopsy procedures. EBUS-TBNA allows for the sampling of mediastinal and hilar lymph nodes, essential for distinguishing between benign and malignant lymphadenopathy. The ultrasound findings in benign diseases typically include well-defined borders, homogeneous echotexture, and the absence of increased vascularity. By combining radial probe EBUS and EBUS-TBNA, clinicians can improve diagnostic accuracy, reduce unnecessary surgeries, and guide appropriate management for patients with suspected benign conditions, providing a minimally invasive approach to obtaining critical diagnostic information.

CHEST-06

Assessment of the Malignant Disease Using Endobronchial Ultrasound

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Endobronchial ultrasound (EBUS) is a pivotal tool in assessing malignant diseases within the respiratory system. This presentation focuses on the use of radial probe EBUS and EBUS-guided transbronchial needle aspiration (EBUS-TBNA) in diagnosing and evaluating malignancies. Radial probe EBUS provides high-resolution ultrasound images of the bronchial wall and adjacent structures, allowing for precise localization and characterization of lesions. It is particularly useful for visualizing peripheral lung lesions and providing guidance for biopsies. On the other hand, EBUS-TBNA enables sampling of mediastinal and hilar lymph nodes, facilitating accurate staging of lung cancer. The ultrasound images obtained with these techniques reveal distinct characteristics of malignant tissues, such as irregular borders,

heterogeneity, and increased vascularity. Together, radial probe EBUS and EBUS-TBNA enhance diagnostic accuracy and guide clinical management, offering minimally invasive options for obtaining

crucial pathological information in patients with suspected malignancies.