CHEST-S01

Application of Ultrasound in Respiratory Failure and Shock

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Acute respiratory failure and shock are both critical conditions in ICU, which need early diagnosis to start accurate management. Traditional physical examinations and bedside radiography are imperfect, which may cause delayed management. By using lung ultrasound, clinicians can quickly and efficiently diagnose acute respiratory failure, which saves time. Professor Daniel A. Lichtenstein introduced the "Bedside Lung Ultrasound in Emergency-the BLUE protocol" algorithm to provide prompt diagnosis of acute respiratory failure. A stepwise 3-step shock ultrasound protocol, called the RUSH exam (Rapid Ultrasound in SHock), is easy to learn and quick to perform for identifying the shock category. The protocol involves 3 parts of bedside sonography assessments. Today, in my speech, I will introduce the BLUE protocol and the RUSH protocol to everyone. Then, I will use an example of one of my patients to show how to diagnose his or her acute respiratory failure and shock with ultrasound equipment.

CHEST-S02

Point-of-Care Ultrasonography in the Critical Care Unit

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Point-of-care ultrasonography (POCUS) has emerged as a valuable tool in critical care units worldwide, revolutionizing the way clinicians assess and manage critically ill patients. This presentation aims to explore the advantages and limitations of POCUS, enabling attendees to understand the primary concerns of their ICU patients, existing POCUS protocols, and how to design ICU-specific protocols for their practice. Recently, the use of artificial intelligence has also been added to provide real-time guidance for probe placement and aid in the acquisition of optimal images.

POCUS offers several advantages that significantly impact patient care in the critical care setting. Firstly, its real-time imaging capability allows immediate assessment of hemodynamic stability and cardiac function, aiding in the early detection and management of shock. Additionally, POCUS assists in identifying pulmonary pathologies, such as pleural effusions and pneumothorax, facilitating prompt interventions. The portability of POCUS machines ensures bedside availability, saving time and improving patient outcomes. Moreover, the non-invasive nature of ultrasound reduces patient discomfort and eliminates the risk of ionizing radiation exposure, making it safer for both patients and healthcare providers.

POCUS has proven to be a valuable tool in critical care, but it does have limitations. Operator dependency can lead to errors in image acquisition and interpretation. POCUS has a restricted field of view and may not penetrate certain structures, hindering its effectiveness in some scenarios. It cannot replace comprehensive imaging and may produce artifacts or be affected by patient-related factors. Achieving proficiency requires dedicated training, and there is a risk of overdiagnosis or underdiagnosis. Despite these limitations, when used skillfully, POCUS remains a valuable asset in bedside assessment and guiding critical interventions.

CHEST-S03

Identification of Specific Endobronchial Ultrasound Features to Differentiate Sarcoidosis from Other Causes of Lymphadenopathy

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In this retrospective observational study conducted from January 2014 to January 2019, we aimed to differentiate sarcoidosis from other causes of lymphadenopathy using specific endobronchial ultrasound (EBUS) features. We analyzed patients with intrathoracic lymphadenopathy who underwent EBUS-guided transbronchial needle aspiration. Ultrasound features, including nodal size, margin, echogenicity, presence or absence of calcification, central hilar structure, coagulation necrosis sign, nodal conglomeration, and the septal vessel sign in the color Doppler mode, were recorded and compared among three groups. Out of 90 included patients, 15 were diagnosed with tuberculosis, 56 with sarcoidosis, and 19 with malignant lymph nodes by EBUS-guided trans bronchial needle aspiration. The sarcoidosis group showed significantly higher presence of nodal conglomeration (94.6% vs. 60.0% vs. 5.3%; P < .001), the septal vessel sign in the color Doppler mode (55.4% vs. 13.3% vs. 15.8%; P = .002), and a distinct margin (73.2% vs. 13.3% vs. 47.4%; P < .001) compared to the tuberculosis lymphadenopathy and malignant lymph node groups. The presence of the coagulation necrosis sign (8.9% vs. 93.3% vs. 31.6%; P < .001) was significantly lower in the sarcoidosis group than in the tuberculosis lymphadenopathy and malignant lymph node groups. A multivariate analysis identified the presence of nodal conglomeration, absence of coagulation necrosis, and presence of the septal vessel sign in the color Doppler mode as independent predictive factors for diagnosing sarcoidosis. The presence of nodal conglomeration, absence of coagulation necrosis, and presence of the septal vessel sign in the color Doppler mode on EBUS are predictive indicators of sarcoidosis

CHEST-S04
How to Approach Superficial Lymphadenopathy by Ultrasound in Patients with Thoracic Disease?

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Lymphadenopathies are a common manifestation in many thoracic diseases, such as malignancy, infection, inflammation, and connective tissue disease. Appropriate workup on the lymphadenopathies may adjunct the final diagnosis or staging of the underlying disease. Ultrasonography is a convenient tool to investigate superficial lymphadenopathies located at neck or axillae. Transducers with adequate frequency should be selected to ensure the images having adequate resolution. A well-organized examination will help clinicians to identify the lesions efficiently and avoid missing or misinterpreting the lymph nodes. Common criteria to differentiate abnormal lymph nodes from the normal include shape alteration and loss of hilum sign. Recognizing the abnormal lymph nodes may guide the decisions on whether to proceed further invasive testing for a definitive diagnosis. The know-hows of the ultrasonography practice on commonly-encountered superficial lymphadenopathies in pulmonology department shall be briefly discussed in this section.

CHEST-S05
Cryobiopsy Guided by EBUS: CGMH Experience

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Cryobiopsy is a new technique used for the diagnosis of pulmonary diseases. Bronchoscopists could get larger biopsy specimens by using cryoprobe rather than traditional forceps biopsy. The

current applications of bronchoscopic cryobiopsy are biopsy of endobronchial tumors, diffuse interstitial lung diseases, and peripheral lung nodules. Some authors suggest that transbronchial cryobiopsy is a potential alternative to surgical lung biopsy in diffuse parenchymal lung disease diagnosis. Recent guidelines suggest surgical lung biopsy should even be replaced with TBLC in eligible patients. Dr. Chang will share the experience of EBUS-guided cryobiopsies in pulmonary diseases at Chang Gung Memorial Hospital.

CHEST-S06

EBUS TBB with Guidsheath: to be or not to be

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Bronchoscopy is a commonly used diagnostic method for peripheral pulmonary lesions (PPLs), but its diagnostic yield varies widely among studies. To improve the diagnostic yield, the use of radial probe endobronchial ultrasound (rEBUS) during bronchoscopic transbronchial biopsy (TBB) has been recommended by The American College of Chest Physicians guidelines for Diagnosis and Management of Lung Cancer. Using a guide sheath (GS) is a way to further improve the diagnostic yield. When using a GS, the target should be found by rEBUS first and then it was reinserted again with a GS. GS was then deployed at the target lesion and biopsy forceps as well as cytology brush can go to the lesion through the GS. It can increase the accuracy of the sampling procedure without the localization of fluoroscopy. With a GS, the pathology diagnostic yield, brushing cytology yield, and washing cytology yield are higher, while the risk for major bleeding is lower. However, the washing culture yield is lower from irrigating the retained fluid in the GS than actual bronchial washing. The major defect of the GS is the cost. It's relatively expensive and our national health insurance has no compensation for it. The application of the GS is also limited by the width of the working channel (it has to be larger than 2.0 mm) and the approaching angle (the GS would kink if the angle is too sharp).