

Ultrasound Guided Lung Biopsy: A Single Center Experience

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Abstract: ***Background:** Lung cancer remains one of the leading causes of cancer-related deaths globally. With the advent of spiral CT, detection of lung and mediastinal lesions has increased, necessitating histological confirmation for optimal patient management. Ultrasound (US)-guided lung biopsy offers a radiation-free, real-time imaging option for sampling peripheral lung lesions in contact with the chest wall. **Methods:** This retrospective cross-sectional study included 60 patients referred for US-guided lung biopsy between March 2021 and July 2021. All patients underwent prior CT imaging to localize the lesion. Under aseptic precautions and local anesthesia, a 17G Cook trocar and cannula were used to obtain multiple trucut samples under continuous real-time US guidance. Post-procedure chest X-ray was performed to detect pneumothorax. **Results:** Adequate diagnostic tissue was obtained in 85% of cases without major complications. Minor complications included small asymptomatic pneumothorax and mild fever in a few patients. **Conclusion:** US-guided lung biopsy is a safe, effective, and readily available modality for peripheral lung and pleural lesions larger than 10 mm, especially beneficial in pregnant women and children to avoid ionizing radiation.*

Keywords: Ultrasound-guided biopsy, Lung cancer, Peripheral lung lesion, Real-time imaging, Pneumothorax, Histological diagnosis

1. Introduction

Chest tumors, especially lung cancer, are a major cause of cancer-related mortality worldwide. With advancements in spiral CT imaging, incidental detection of lung and mediastinal lesions has increased, necessitating histological diagnosis for treatment planning. Imaging-guided biopsy, including CT fluoroscopy and ultrasound, is a key method for obtaining tissue samples. Ultrasound-guided biopsy offers the advantages of no radiation exposure, easy availability, and real-time visualization of vessels, but is limited to large, peripheral lesions in contact with the chest wall due to acoustic limitations through aerated lung.

2. Methodology

A retrospective cross-sectional study was conducted involving 60 patients referred from the oncology department for US-guided lung biopsy between March 2021 and July 2021. Inclusion criteria were peripheral lung or pleural lesions ≥ 10 mm in contact with the chest wall. Hilar masses and small intrapulmonary nodules without pleural contact were excluded. All patients had prior CT scans for lesion localization. Under aseptic conditions, local anesthesia was administered, and a 17G Cook trocar and cannula were used to approach the lesion. Multiple trucut samples were obtained with a Cook semi-automatic 10mm throw gun. Continuous US guidance was used to monitor needle advancement and sampling. Post-procedure, a chest X-ray was performed to detect pneumothorax.

3. Results & Discussion

US-guided lung biopsy provided adequate diagnostic tissue in 85% of patients. Minor complications included small, asymptomatic pneumothorax and mild fever (38.0°C – 38.5°C) in a few cases. No major complications were reported. These results are consistent with previous studies showing high diagnostic yield and safety of US-guided lung biopsy for peripheral lesions in pleural contact. Its

advantages over CT-guided biopsy include real-time vessel visualization, lack of ionizing radiation, lower cost, and applicability in pregnant women and children.

4. Conclusion

US-guided lung biopsy is a safe, effective, and cost-efficient method for diagnosing peripheral lung and pleural lesions ≥ 10 mm in contact with the chest wall. It avoids ionizing radiation exposure and allows real-time visualization of vessels, making it particularly useful for special populations such as pregnant women and pediatric patients.

References

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