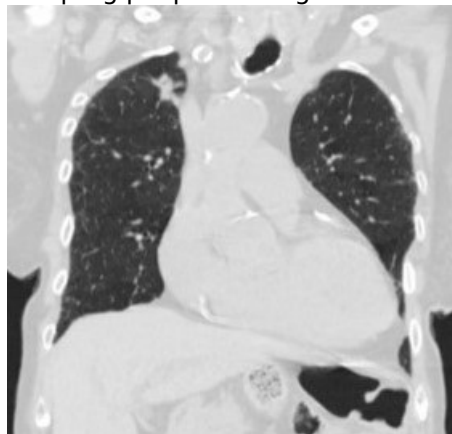


When Needle Biopsy Falls Short - Robotic Assisted-Bronchoscopy May Be a Solution for Inaccessible Peripheral Pulmonary Nodules

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Introduction: The widespread use of chest computed tomography (CT) has increased the detection and surveillance of small solitary pulmonary nodules. Most nodules identified by screening imaging are located in the lung periphery, which is often a challenging location for tissue sampling. Some peripheral lesions previously inaccessible by traditional bronchoscopy or image guided needle biopsy now have the potential to be biopsied using robotic-assisted bronchoscopy (RAB). RAB is novel technology that has thus far only been available in a limited number of centers across the United States. **Case Description:** An 82-year-old woman with a past medical history of pulmonary fibrosis (FEV1/FVC 82%, TLC 57%, DLCO 62%) presented to the outpatient clinic for workup of 17 mm right upper lobe nodule (Image 1). This lesion was first visualized on CT in March 2020 and was notably not present on CT in September 2019. The Mayo Clinic score for this nodule was 77%. The rapid enlargement of the nodule in conjunction with the patient's 60 pack year smoking history was suspicious for primary pulmonary malignancy. Traditional bronchoscopy was unsuccessful in obtaining a tissue sample. Transthoracic needle aspiration by interventional radiology was non-diagnostic, yielding only atypical cells. Repeat needle biopsy was not advised due to the degree of difficulty accessing the lesion and the high risk of complications. Given these factors, the patient underwent RAB using the Monarch™ platform (Auris Health, Inc., Redwood City, CA) without any complications. Biopsy via RAB revealed well differentiated adenocarcinoma. Definitive diagnosis allowed the patient to begin treatment with stereotactic body radiation therapy. **Discussion:** Despite a diagnostic yield of roughly 92%, this case illustrates the shortcomings of image guided needle aspiration in sampling peripheral pulmonary lesions. We demonstrate a peripheral lesion biopsy with adequate diagnostic yield and no complications by utilizing RAB in a community hospital. RAB is an emerging technique that has been reported to be successful in sampling approximately 97% of peripheral lesions between 10 to 30 mm in size. While there are other novel bronchoscopy techniques, including CT guided bronchoscopy and fluoroscopy-based navigation trans-parenchymal nodule access, the diagnostic yield remains suboptimal between 40 and 70%. RAB is unique by allowing for lesion sampling under direct visualization with high diagnostic yield and complication rates comparable to alternative techniques. Thus, RAB may become the future method of choice in sampling peripheral lung nodules.



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