

UGRAB: A novel biopsy device for endobronchial ultrasound bronchoscope

Value Proposition

A wide variety of malignant as well as non-malignant lung diseases are diagnosed through cytological and/or histological testing performed on tissue samples acquired by a lung biopsy. The state-of-the-art, minimally invasive method to perform lung biopsies is using endobronchial ultrasound bronchoscopes (EBUS). In this procedure, tissue samples are extracted by aspiration using a fine needle under ultrasound guidance. However, samples acquired in this fashion suffer from two main drawbacks: they are limited in volume and are unable to maintain structural integrity. These drawbacks preclude these samples from being useful for genetic, biomarker, and histological analyses. These tests are critical to accurately pin-point the root cause of lung disease and guide therapeutic planning.

Technology

The proposed technology enables the acquisition of core biopsy using EBUS scopes. It merges the benefits of current aspiration needles (length, flexibility, and EBUS-compatibility) with those of core biopsy needles (quick automatic cutting, reliability, ease-of-use, and ability to acquire large volumes of tissue). The ability to perform core biopsy under ultrasound guidance would greatly improve the yield, accuracy, and utility of EBUS procedures and consequently save on time as well as cost by minimizing repeat procedures and surgical delays.

Other Applications

The proposed device can also be useful in other medical specialties to extract tissue from organs where the access path to the target tissue is circuitous and thus requires a flexible cutting tool e.g., gastroenterology, cardiology.

Advantages

Fine-needle aspiration is the current standard for minimally invasive lung biopsies. The proposed device would address both drawbacks of the current procedure by increasing the volume of tissue acquired and maintaining the macro-architecture of samples.



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