

# Transbronchial lung cryobiopsy guided by radial miniature probe EBUS in interstitial lung diseases – Polish experience

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## Introduction

Transbronchial lung cryobiopsy (TBLC) plays an important role in histological evaluation of interstitial lung diseases (ILD). The basic technique of TBLC is clear but both patient sedation and method of controlling cryoprobe position differ. According to the most popular approach transbronchial lung cryobiopsy (TBLC) is performed in intubated patient under fluoroscopic control and general anesthesia. The histological yield of TBLC reaches 80%. Pneumothorax and bronchial bleeding are the most important complications of this procedure.

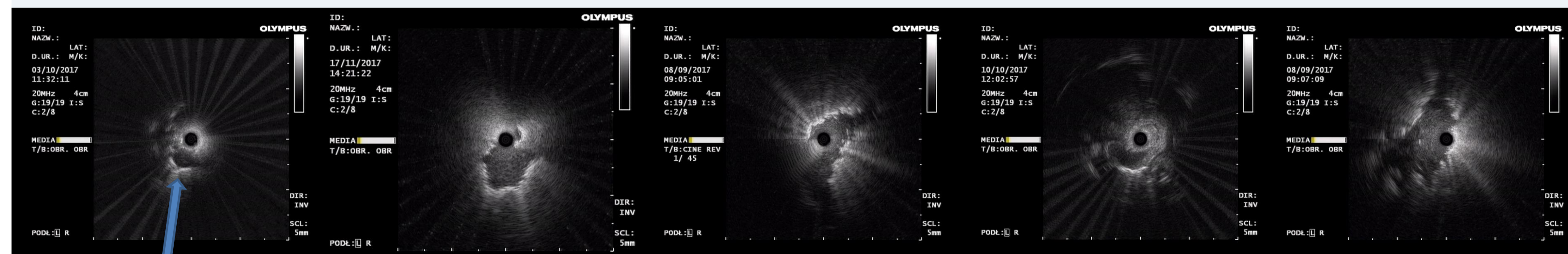
In our pulmonology centers TBLC is performed under conscious sedation and guided by radial EBUS, and intubation and fluoroscopy are not used.

Five years after introducing this methodology we wanted to examine efficacy and safety profile of this approach and to find out how much the type of interstitial lung disease (ILD) influences the diagnostic yield of TBLC.

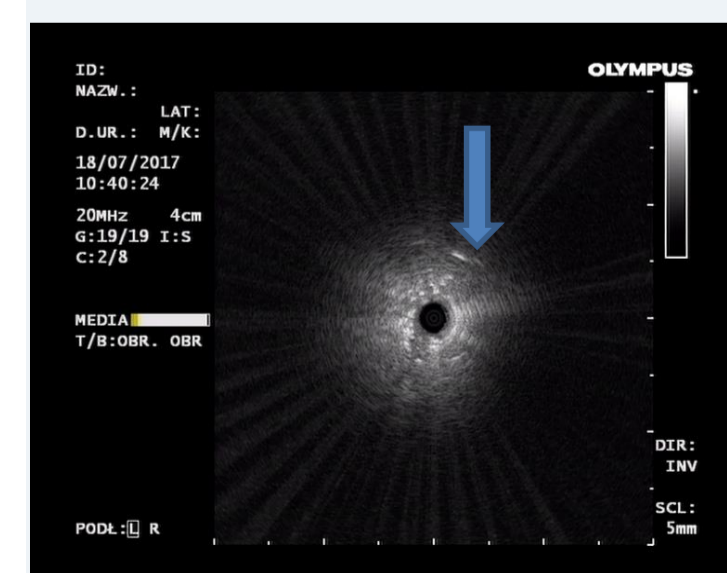
## Methods

A multicenter Polish retrospective study was conducted to analyze the influence of biopsy on the final diagnosis and complications in patients with granulomatous and other ILDs.

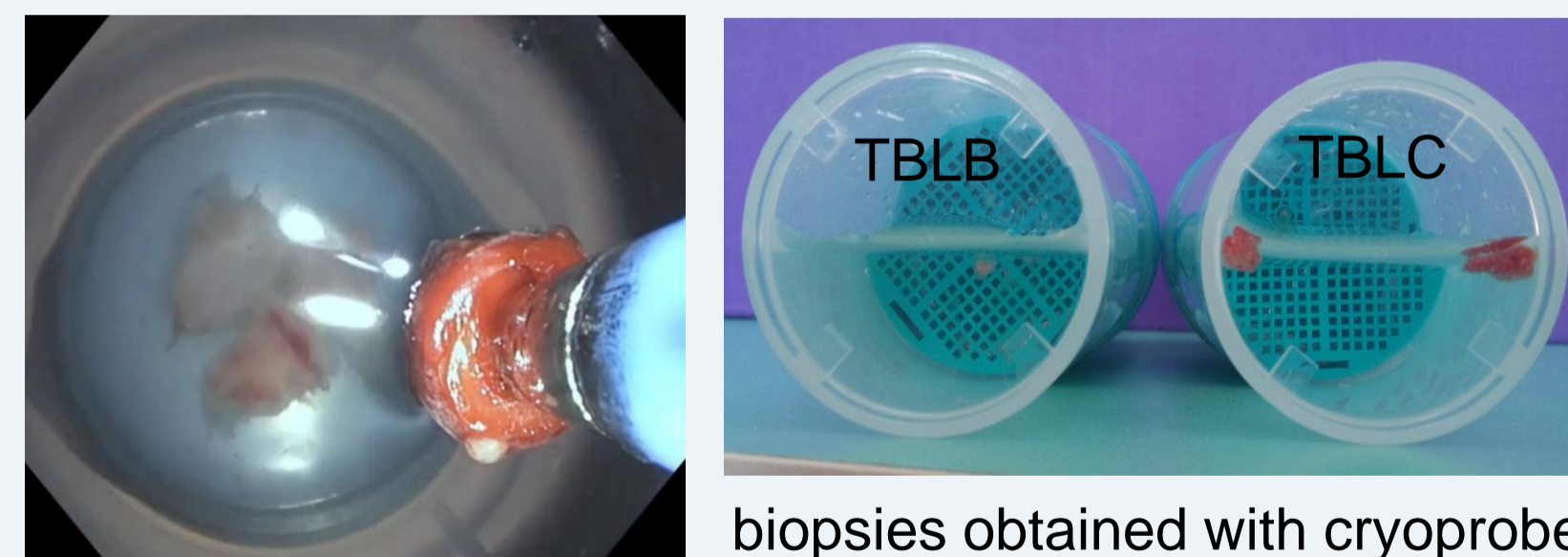
In accordance with high resolution computed tomography (HRCT) selected lung segments were examined by use of radial *mini-probe* EBUS while performing flexible videobronchoscopy, under mild sedation (Midazolam, Fentanyl). If the lung infiltrates were visible in ultrasound imaging this locations were preferred for biopsy. If not visible specimens were taken from two different segments of the same lobe. Two to five biopsies with mean (SD) freezing time 7 (1) seconds were performed by use of 1.9 or 1.7 mm cryoprobe. Moreover ultrasound guidance was used to avoid injury of lung vessels and pleura. Fluoroscopy and balloon blockers were not used in all procedures.



pulmonary vessel adjacent to the bronchial wall  
different ultrasonographic images of pulmonary infiltrates



normal lung parenchyma - ultrasonography obtained with use of radial *mini-probe* EBUS (Olympus) – „pleural sign” indicated with blue arrow



biopsies obtained with cryoprobe



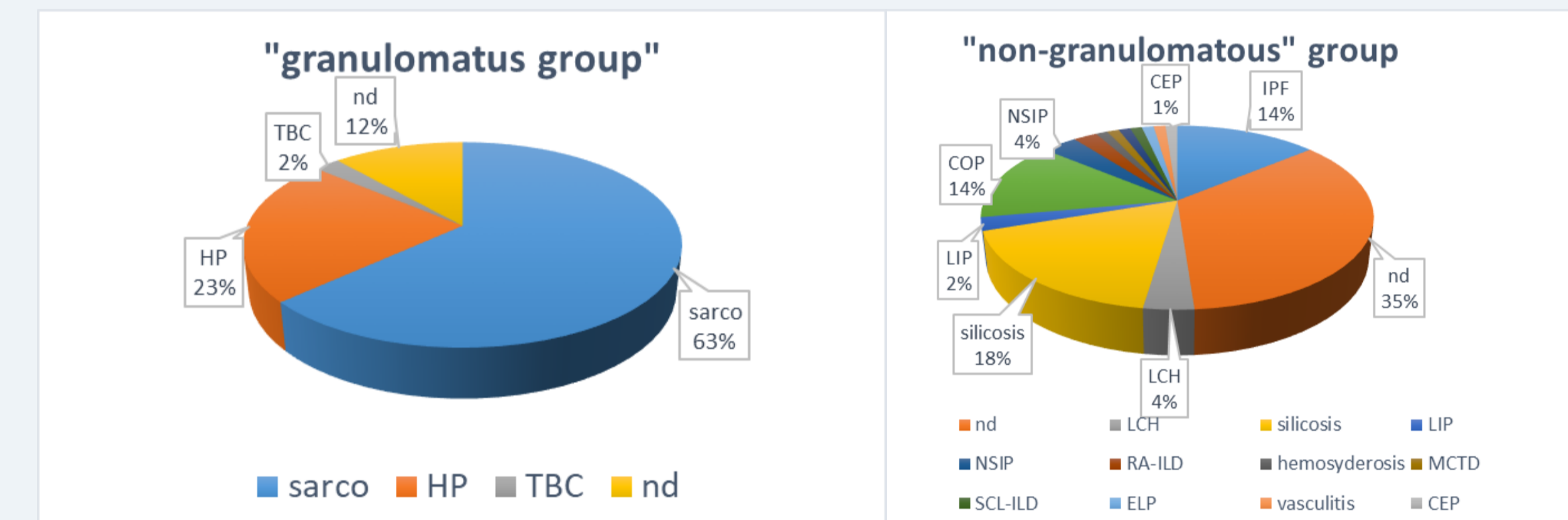
ERBECRYO@2 unit with flexible cryoprobe (www.erbe-med.com)

## Results

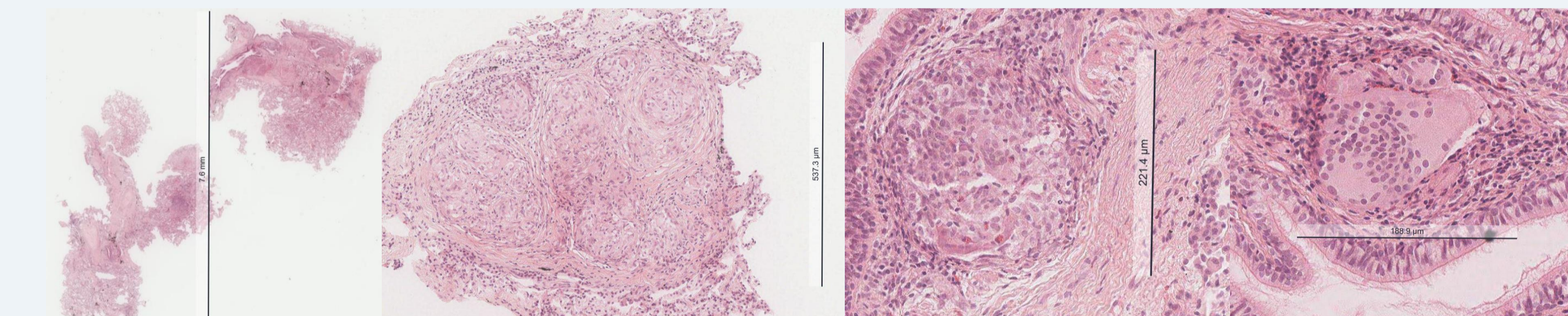
173 patients (M:85,F:88) of mean age (SD) 54.5 (13.5) years underwent TBLC since March 2017 to April 2022. 87 due to suspicion of granulomatous ILD (sarcoidosis, HP, TBC) and 86 due to other ILDs. Sensitivity and accuracy of TBLC in both groups were 93.9%, 94.3% and 64.3%, 65%, respectively and significantly higher for granulomatous ILDs ( $p < 0.05$ ); overall were: 78.9% and 79.8%. Pneumothorax occurred in 4.6% in the first and 4.7% in the second group. No severe or moderate bleeding was noted.

Parameter	Granulomatous disease suspected (n=87)	Non-granulomatous disease (n=86)	All diagnoses (n=173)
Sensitivity	93.9%	64.3%	78.9%
Accuracy	94.3%	65%	79.8%

The influence of the type of suspected disease on the diagnostic yield of transbronchial lung cryobiopsy



COP – cryptogenic organising pneumonia, ELP – exogenous lipid pneumonia, CEP – chronic eosinophilic pneumonia HP – hypersensitivity pneumonia, IPF – idiopathic pulmonary fibrosis, NSIP – non-specific interstitial pneumonia, RA-ILD – rheumatoid arthritis connected interstitial lung disease, TBC – tuberculosis, MCTD – mixed connective tissue disease, LIP – lymphocytic interstitial pneumonia, SCL-ILD – scleroderma connected ILD, SRIF – smoking related interstitial fibrosis



microscopic imaging of the lung cryobiopsy in H&E staining (Langerhans Cell Histiocytosis) courtesy of Pathology Department of Pulmonary Hospital, Zakopane

## Conclusions

TBLC guided by radial EBUS miniature probe without intubation and fluoroscopy control is safe and has similar yield to other modalities. The type of suspected disease has the biggest impact on biopsy efficacy.

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