

# Cryo-Biopsy versus 19G needle versus 22G needle with EBUS-TBNA endoscopy for Lung Cancer Diagnosis-Tissue is still the issue

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## ABSTRACT

**Introduction:** We have been using cryo-biopsy for endobronchial lesions for lung cancer diagnosis and debulking. Cryo-biopsy is also known to be an excellent tool for diagnosis of lung interstitial disease. Recently cryo-biopsy with the 1.1mm probe was used for lymphnode biopsy.

**Patients and Methods:** 311 patients participated with lymphadenopathy and at least one lung lesion. The following tools were used for diagnosis; 22G Mediglobe Sonotip, 22G Mediglobe, 21G Olympus, 19G Olympus and 1.1mm cryo probe ERBE CRYO 2 system (3 seconds froze). A PENTAX Convex-probe EBUS was used for biopsy guidance.

**Results:** Cell-blocks slices had a higher number in the 19G needle group (19G> Cryo Probe>22G Mediglobe Sonotip >21G Olympus >22G Mediglobe).

**Conclusion:** Cryo biopsy of the lymphnodes is safe with the 1.1mm cryo probe. Further studies are needed in order to evaluate new probes and the technique specifications.

**Keywords:** radial-ebus, Linear-EBUS, 22G needle, 21G needle, 19G needle, cryo-biopsy, bronchoscopy, lung cancer, cancer

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## INTRODUCTION

The sample size of 22G needle and 21G needle is efficient for the diagnosis of lung cancer and metastatic cancers<sup>6</sup>. The sample and the current techniques allow the molecular investigation of this small size sample with next generation sequencing (NGS)<sup>7,8</sup>. Positron emission tomography-Computed tomography (PET-CT) will complete the staging<sup>9</sup>. In the recent five years cryo biopsies have been extensively used for the diagnosis of diffuse lung disease due to the larger tissue sample<sup>10</sup>. This was made possible with the use and experience of radial-endobronchial ultrasound and the new electromagnetic systems which were used for guidance of the cryo-probe<sup>11-13</sup>. In the case of endobronchial lung cancer cryo biopsies have been extensively used<sup>14</sup>. However; in the case of lymphadenopathy until now we have been using 22G, 21G and 19G needles as a minimal invasive technique compared to mediastinoscopy<sup>15</sup>. An effort has been made to acquire more sample and therefore the cryo probe 1.1mm has been used with an ERBE CRYO 2 system<sup>16,17</sup>. There are no technique specifications and there are ongoing studies in the field, we performed this study in order to enlighten the sample size.

## METHODS AND MATERIALS

311 patients participated with lymphadenopathy and at least one lung lesion. The following tools were used for diagnosis; 22G Mediglobe Sonotip, 22G Mediglobe, 21G Olympus, 19G Olympus and 1.1mm cryo probe ERBE CRYO 2 system (3 seconds froze). A PENTAX Convex-probe EBUS was used for biopsy guidance. Results: Paraphin-block slices had a higher number in the 19G needle group (19G> Cryo Probe>22G Mediglobe Sonotip >21G Olympus >22G Mediglobe).

## RESULTS

The sample of patients consisted of 311 individuals ranging between 30 and 80 y.o. and having the main bulk to be distributed between 55 and 75 y.o (229 patients, 73.6%). We considered that 22G Mediglobe FNA needle and cryo probe are the "small" tip techniques and that the 22G Mediglobe Sonotip FNA, 21G Olympus FNA and 19G Olympus FNAB are the large tip techniques based the diameter of the tip in order to make the statistics easier. Accordingly, men prevail over women at a ratio 1,4:1 (181:130) with similar mean numbers of slices (7.8 to 8.9). The five techniques of needle and probe penetration disclose the presence of two groups, one with small content (22G Mediglobe FNA and Cryoprobe) and 4,1 mean slices and another group of needles with large content and 11 mean slices

## RESULTS

Making a more insightful look in the regression lines as better exemplified by embedding the two groups of method 2 (S and L) shows, it appears that only the large needle content facilitates the creation of slices covering the full range of cell blocks, while the small content responds to only one block. Furthermore, the cross-tabulation of N slices per cell block and needle content reveals a very close agreement between predicted and actual values of mean slices, strongly enhancing the reliability of regression model attempted in the present study. Cryo biopsies were not superior in terms of sample volume, at least with our methodology. We present the following algorithm according to the larger volume to the lowest 19G Olympus > Cryo biopsy > 22G Mediglobe Sonotip > 21G Olympus > 22G Mediglobe.

## DISCUSSION

Although cryobiopsies are very efficient for endobronchial lesions, they acquire more tissue than all type of needles. However; they should not be used for lymphadenopathy. The 19G needle acquires more tissue in less time than when small cryo probes are used

## CONCLUSIONS

Cryo biopsy of the lymphnodes is safe with the 1.1mm cryo probe. Further studies are needed in order to evaluate new probes and the technique specifications. 19G needle still remains the best equipment used for biopsy for endobronchial ultrasound bronchoscopes-EBUS-TBNA. 19G needles should be used instead of 22G, 21G and Cryobiopsy.

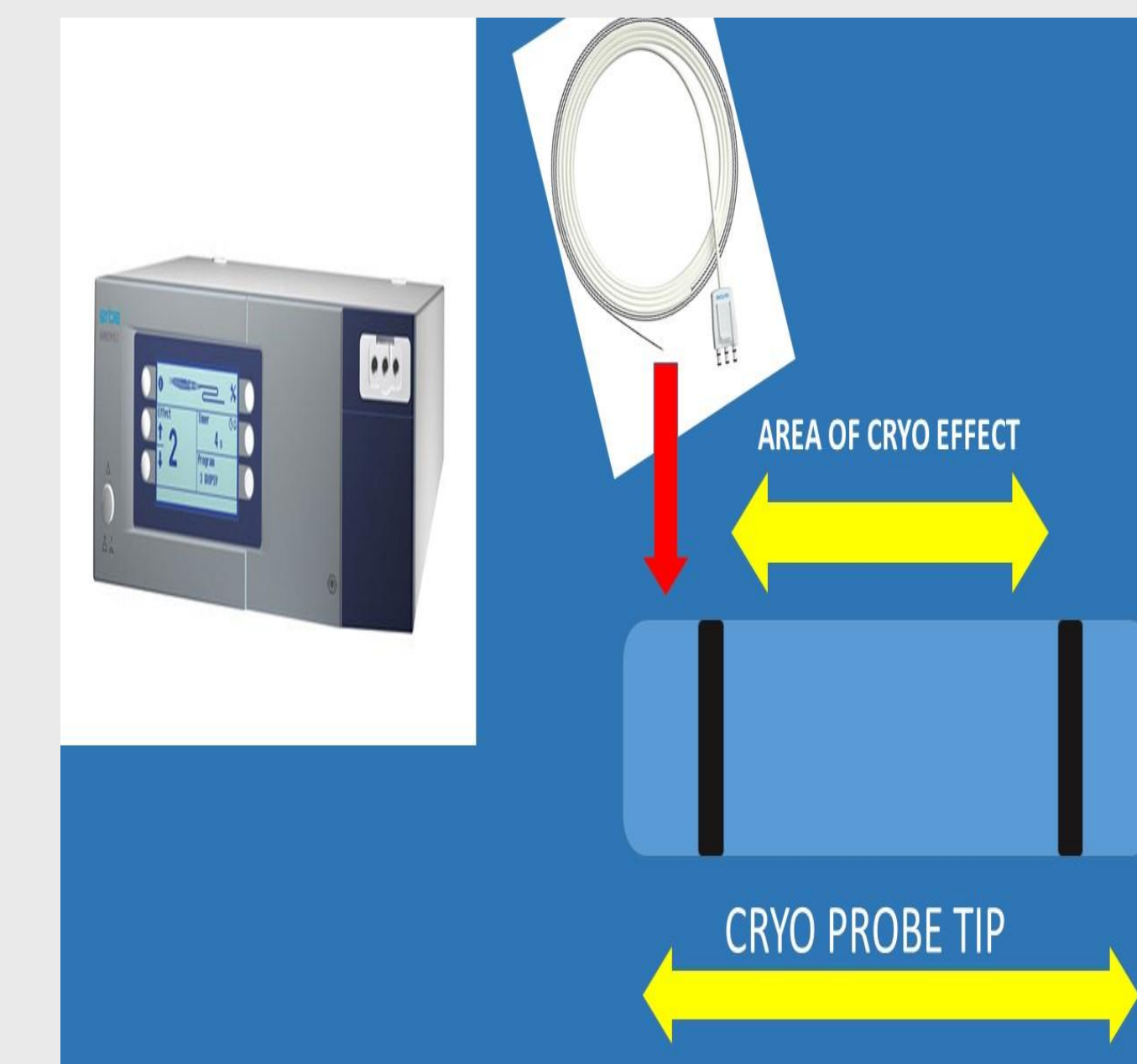
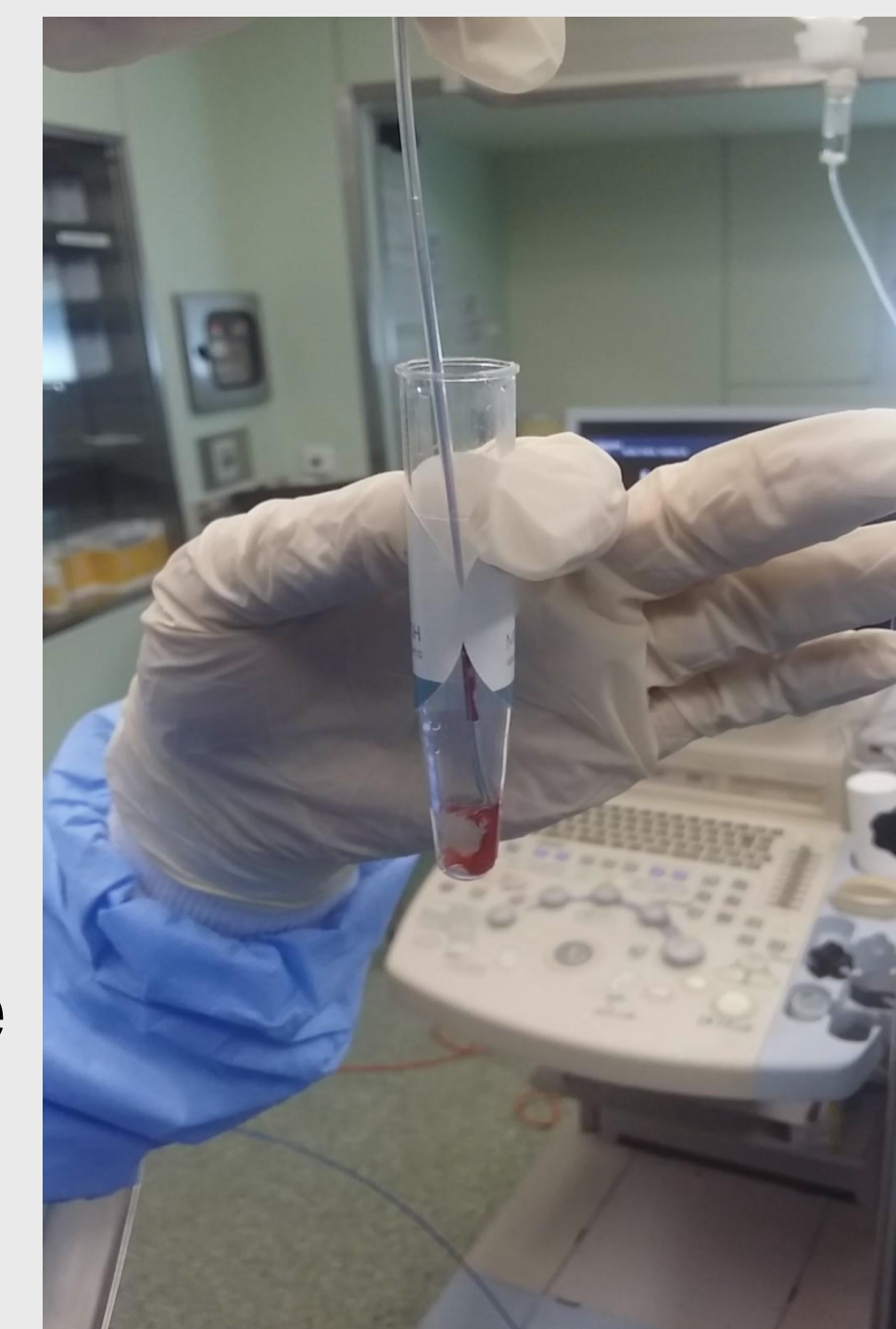
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**Figure 1.** Left cryoprobe During cryobiopsy and Right 19G needle.

**Figure 2.** 19G needle biopsy



**Figure 3.** New Cryo Probe Model Proposal