



## Advanced fluoroscopy- endoscopy hybrid room for prompt diagnosis of lung tumors: an efficient solution

Experience of Dr. Stefan Barath at  
Skane University Hospital - Lund



**The Interventional Oncology Lung department of Skane University Hospital - Lund, has built an innovative hybrid room solution. The advanced endoscopy performed with high image quality fluoroscopy guidance, allows Dr. Barath to bring the biopsy tools towards the soft tissue tumor and to limit the iterative process of biopsy specimen collection. Right after extraction, each collected sample goes through cytological analysis for qualification. The overall procedure performed in ambulatory patient conditions, ensures that the quality of the biopsy sample permits diagnosis and treatment planning during the procedure. This solution has been put in place by the practitioners to answer to the healthcare guideline<sup>1</sup> limiting the delay of lung tumor diagnosis and treatment planning.**



## From a national initiative for optimizing care pathway for patients with lung cancer...

In 2017, the Swedish Ministry of Health in collaboration with regional cancer centers, issued a guideline<sup>1</sup> for the

characterization of lung tumors.<sup>1</sup> The objective was and still is to decrease the time between reasonable suspicion of tumors to the initiation of treatment.

*"From the first diagnostic X-ray to surgery, the delay shall not exceed 40 days: every day counts!"*

With the increasing number of patients screened by thoracic X-ray, as first examination for lung pathology

**"The only way to accelerate the diagnostic investigation and define the treatment strategy for the lung tumor, is to have a fully-integrated hybrid room with both advanced endoscopy and high-quality fluoroscopy guidance, so cytology analysis can be performed within the same procedure."**

Dr. Stefan Barath

diagnosis, the Interventional Oncology Lung Department at Skane University observed an increase in biopsy procedures over the past year of about 25%," noted Dr. Barath.

The Interventional Lung Oncology department estimated its annual activity to be 1,800 endoscopic procedures including 750 Endobronchial Ultrasounds (EBUS) for two practitioners. This successful activity contributed to the designation of the department as a reference center for Sweden.

## ...to a unique solution

In an effort to meet the national guideline, the Lund Thoracic Oncology department developed an innovative hybrid room dedicated to lung tumor investigation.

This highly technical room combines advanced endoscopy, including EBUS (Olympus) capability, as well as Electromagnetic Navigation Bronchoscopy ENB (SuperDimension™, Medtronic) with high quality fluoroscopy guidance (OEC Elite CFD, GE Healthcare).

## High quality fluoroscopy guidance with flat panel detector mobile C-arm

"Biopsies are mostly performed in lung peripheral tumor tissues where higher toxicity recurrence is observed.

Beyond the first third of the lung, endobronchial probe guidance is performed under fluoroscopy.

The reduced diameter towards sub segmental bronchus - up to 1 mm (Fig. 1, Fig. 2 and Fig. 3) - and the

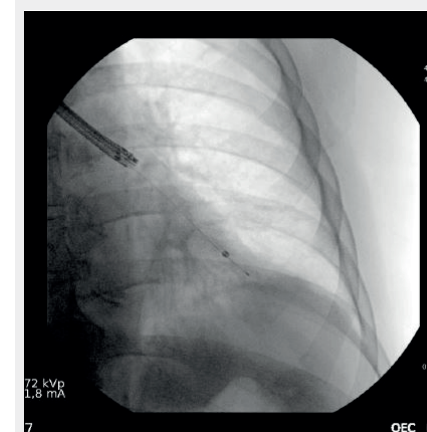


Fig.1 Cytology brush insertion in tumor for biopsy

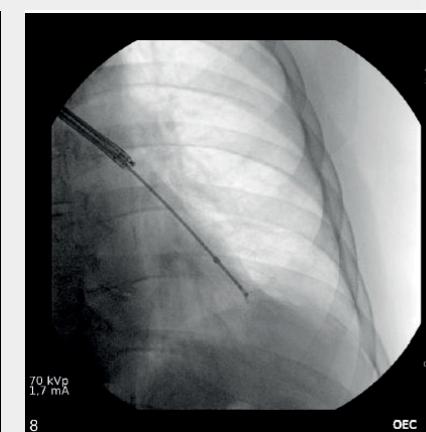


Fig.2 Biopsy forceps introduction in tumor

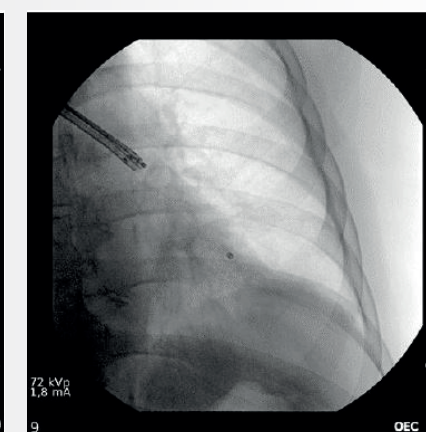


Fig.3 EBUS probe is introduced at suspected tumor level

complexity of the branching structure of the respiratory tracts requires high image resolution and contrast for the navigation guidance.

In some complex endoscopic procedures EBUS can be used to accelerate the identification of the tumor, and to assist with the insertion of the brush within pathologic tissues. In this case, the image shows a non-homogenous echo.

The localization of the tumor can be improved with the use of the SuperDimension (Medtronic) navigation system. This Electromagnetic Navigation Bronchoscopy (ENB) system can help the practitioner to get better angles for biopsy," noted Dr. Barath.

**"This new OEC Elite CFD Ergo C-arm is very easy to use for non-radiology staff. The user interface is simple. I unlock all the brakes, and then it is very easy to move from frontal to oblique views. I need high image quality with high resolution so I can see the characteristics of the tumors.**

**I need to see the borders of the tumor and their location. The OEC Elite CFD provides me with this high resolution image and large Field of View from the flat detector."**

Dr. Stefan Barath

Once the tissue sample is removed, the cytology analysis is performed and shown immediately to the practitioner. The team evaluates the quality of the sample extracted and the need to extract another one for the final histology analysis.

Dr. Barath might extract and analyse up to six samples within the same procedure.

A dedicated user interface has been designed by the hospital for the hybrid room to allow the endoscopist to select the source of image he wants to display on the monitors." □



Dr. Stefan Barath, PhD., Interventional Lung Oncologist, was trained in Umea University Hospital in Respiratory Medicine and Allergy. He specialized in advanced endobronchial endoscopy techniques.

He has a PhD in Respiratory Medicine.

He is a consultant at Lund University Hospital for two years.

1. [https://www.cancercentrum.se/globalassets/vara-uppdrag/kunskapsstyrning/varje-dag-raknas/informationsmateriel/everydaycounts\\_baspresentation\\_rev\\_vers\\_11sep15.pptx](https://www.cancercentrum.se/globalassets/vara-uppdrag/kunskapsstyrning/varje-dag-raknas/informationsmateriel/everydaycounts_baspresentation_rev_vers_11sep15.pptx)  
Presentation Every Day Counts from Regionala cancercentrum i Samverkam

The statements by GE's customers described here are based on their own opinions and on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist, i.e. hospital size, case mix, etc., there can be no guarantee that other customers will achieve the same results.