

# Navigation in the Lung

## Supported by syngo DynaCT Cardiac

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“Local ablative therapies like intratumoral chemotherapy may considerably extend the lifespan of patients and I am convinced that syngo DynaCT can contribute to doing so more precisely in the future.”

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### Patient History

A 70-year-old female.

### Diagnosis

The patient was diagnosed with moderately differentiated lung adenomatous carcinoma four years ago and initially treated with chemotherapy. Currently the patient presents with multiple intrapulmonary nodules, metastases in the sternum and multiple osteoplastic metastases in the thoracic spine. Additionally the patient has cerebral metastases.

The patient was admitted for an update to diagnose the response to chemotherapy. In general the patient suffers from moderate dyspnea.

### Treatment

A rapid data acquisition was performed with syngo DynaCT Cardiac under deep sedation and jet ventilation. In this intra-procedural 3D data set the tumor is clearly visible. Navigation through the bronchi is possible in different ways:

- 1 The 3D volume is overlaid with live fluoroscopy. This way, the physician can see live the movement of the biopsy forceps toward the tumor and make sure the biopsy captures the tissue (Fig. 1).
- 2 In addition to option 1, it is possible to manually mark a path through the bronchi as well as the volume of the tumor on the workstation. This path can then again be overlaid and followed when advancing the forceps to the tumor (Fig. 2).
- 3 Another option is to do a virtual bronchoscopy. The software currently allows navigation up to the 9th debranching of the bronchial tree (Fig. 3).

### Comments

Intra-procedural 3D imaging of the bronchial tree with syngo DynaCT Cardiac together with the other software applications (syngo iPilot, syngo iGuide Toolbox and syngo FlyThrough)

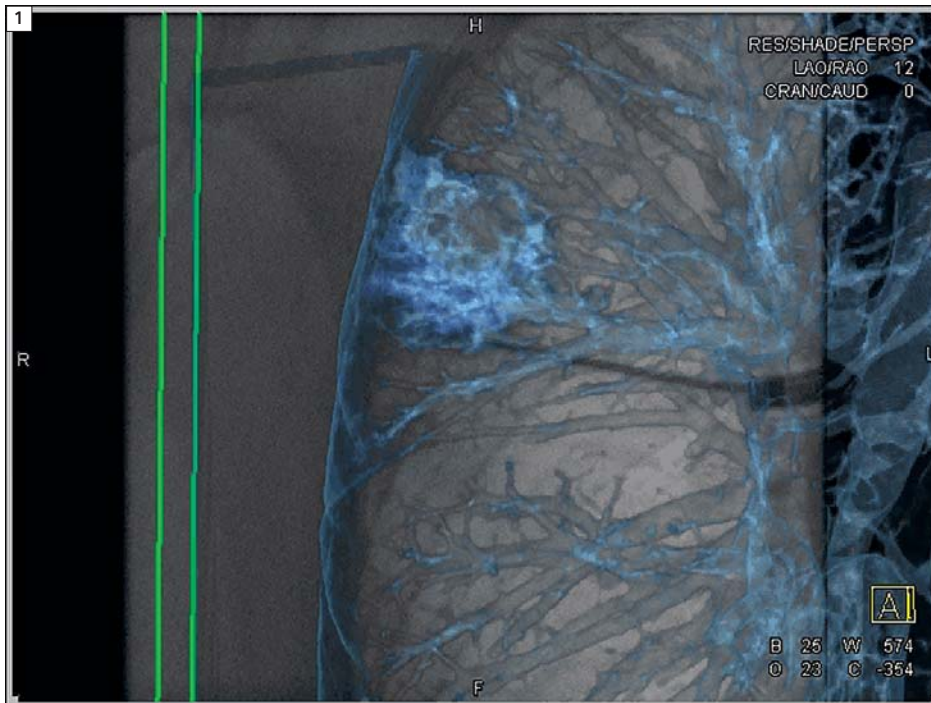
supports biopsies of even early-stage lung cancer. The open structure of the C-arm is well suited for interventions and proves to be useful in the field of pneumology.

The demonstrated case, shows that an overlay of the tumor in the 3D data set and the real-time fluoroscopy is very precise due to the fact that the whole procedure – 3D data acquisition and bronchoscopy – is done in the same suite at the same time and nearly in the same position of the diaphragm, guaranteed by the apnea under deep sedation (not general anesthesia) and jet ventilation.

We conclude that with syngo DynaCT Cardiac rapid onsite navigation in the lung could soon be a routine application in the bronchoscopy suite. syngo DynaCT Cardiac has the power to be the central part of a hybrid interventional pneumology / thoracic surgery suite.

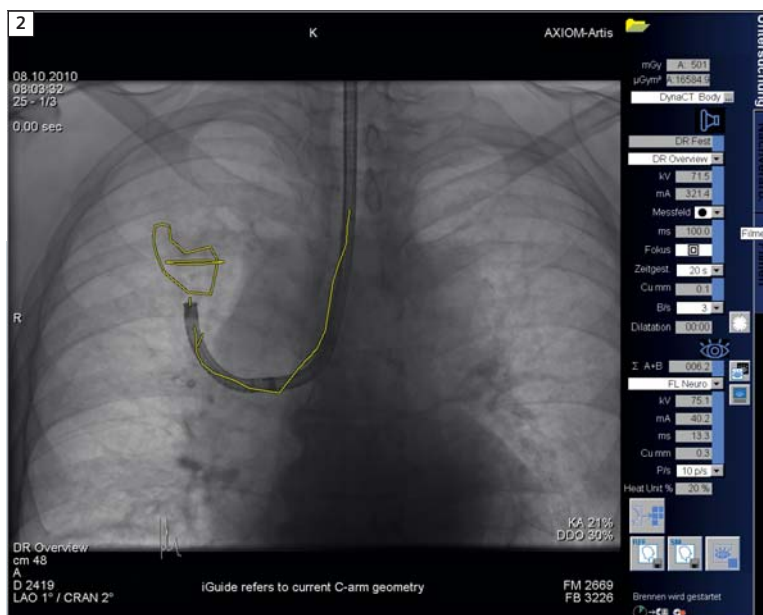
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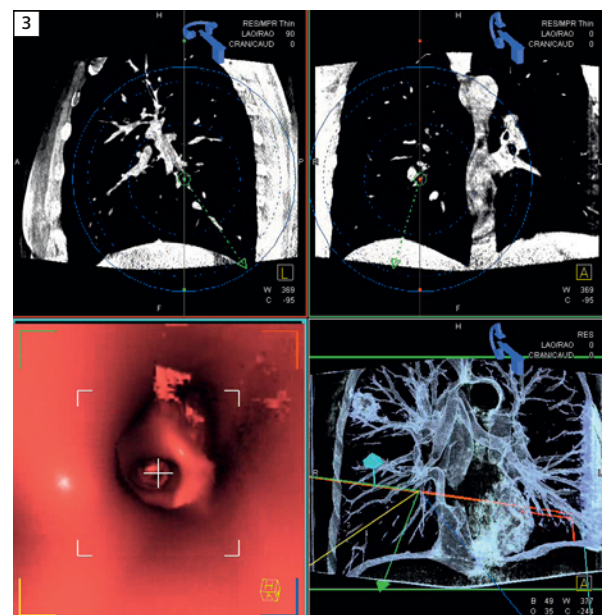


**1** 3D volume of the lung (syngo DynaCT Cardiac) with live fluoroscopy overlay (syngo iPilot).

Please note:  
the clinical images are  
from different cases.



**2** Manually marked path (syngo iGuide Toolbox) through the bronchi and marked tumor volume.



**3** Virtual bronchoscopy based on syngo FlyThrough.