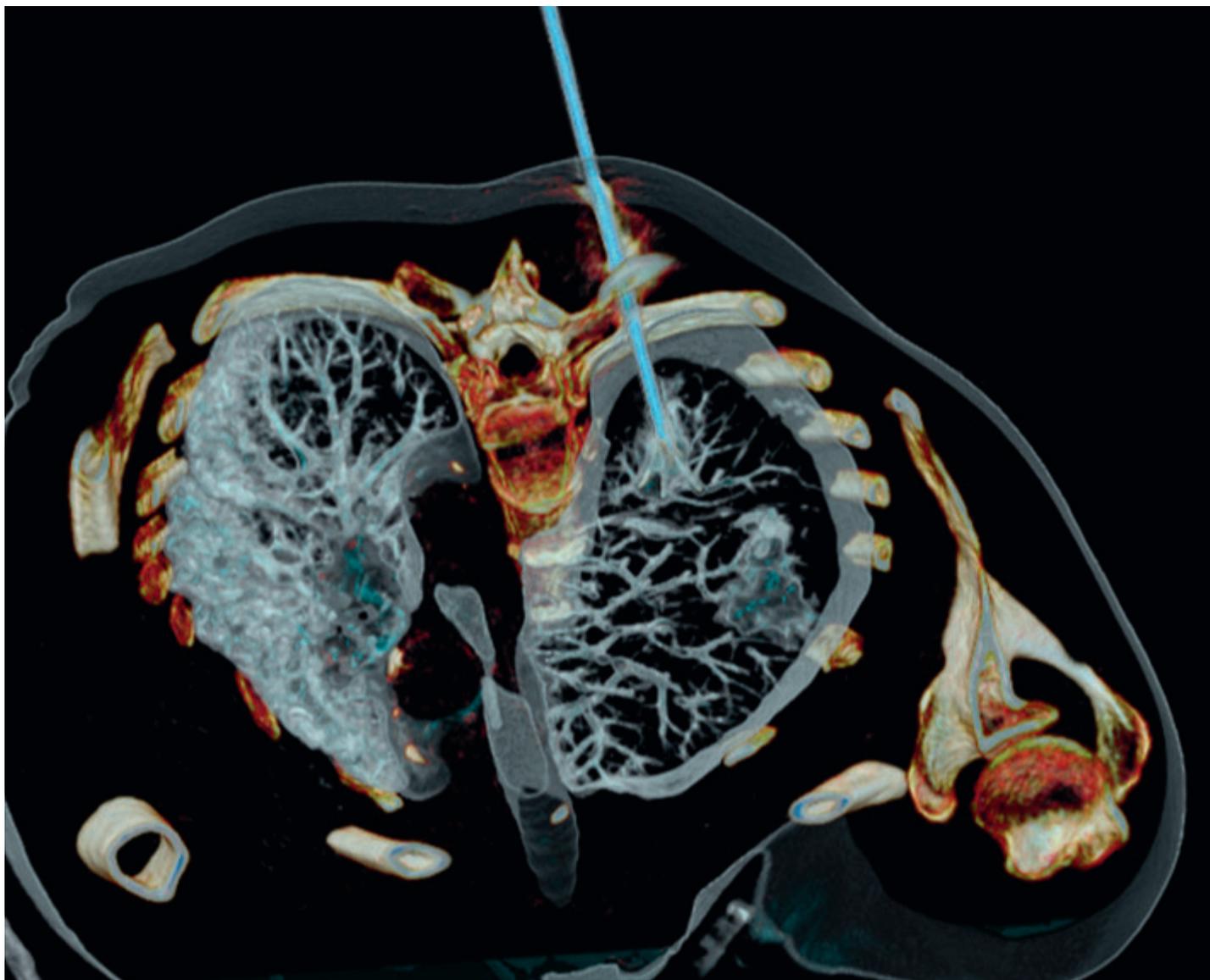


Case 5

The SOMATOM Definition AS With the CT Oncology Engine – Outstanding Clinical Outcomes From Diagnosis to Treatment for Everyday Oncology

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Siemens newest CT scanner, SOMATOM® Definition AS, is the ideal routine radiology CT scanner. From diagnostic imaging to biopsy and CT guided, minimally invasive therapies, this is a scanner that has been designed to be the ultimate all-rounder.

In this section, we take a focused look at how the SOMATOM Definition AS with its wealth of unique new technologies and features, can be combined with the CT Oncology Engine to create a solution that gives clinicians the opportunity to reach new levels of diagnostic confidence and the opportunity to achieve even better clinical outcomes in routine oncology imaging.

In routine oncology, CT plays an increasingly important role in diagnostics and staging. In recent years there has also been a steady rise in the use of CT for biopsy and for image guided, minimally invasive therapies such as radiofrequency ablation (RFA). The new SOMATOM Definition AS has been designed with these growing trends in mind. With its Adaptive 3D Intervention™ and ultra-efficient, new interventional workflow, the SOMATOM Definition AS takes interventional CT to a new level of speed and accuracy.

For all procedures, whether non-fluoroscopic ("step and shoot") or fluoroscopic, the traditional 2D workflow has been significantly enhanced. Beginning with a new intuitive and fully customizable user interface, clinicians can tailor everything from the scan protocols, through image reconstruction to real-time viewing with a screen setup that can even include previous studies for reference. Clinicians also benefit from i-Auto Needle Detection, which helps in path planning or determining the position of the needle if it has gone outside the scan range when using step and shoot modes. When extra clarity is needed, the i-PrecisionView allows one-touch adjustment of mAs settings for the next scan, returning automatically to the dose managed protocol on the next scan. Additionally i-NeedleSharp facilitates additional clarity when using artefact-prone materials such as metal needles.

The SOMATOM Definition AS also features a completely new concept for in-room control. The i-Control delivers the ultimate

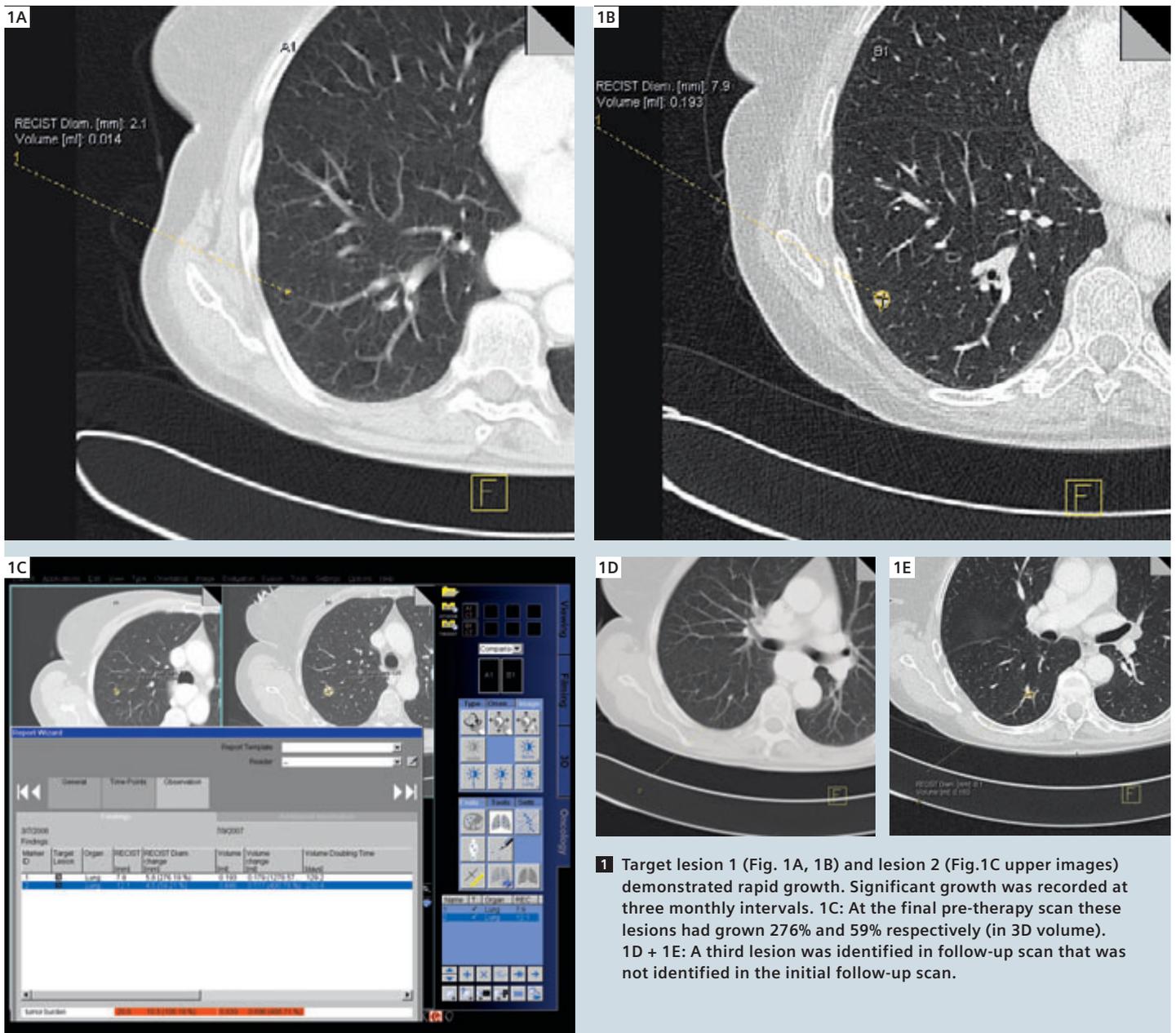


i-Control – ultimate level of in-room control for minimally invasive procedures.

in remote in-room control for the entire interventional procedure. In combination with a foot switch for activating the scan, clinicians are able, to carry out the entire procedure without the need for additional personnel. The i-Control facilitates full control of the syngo Acquisition Workplace via a remote mouse joystick; it also features full table control offering one-click positioning to last scan or table position. In addition, images can be windowed according to customizable presets. But the most trendsetting innovation for interventional CT is the possibility to perform interventions using 3D guidance. Adaptive 3D Intervention™ allows clinicians to acquire a spiral scan (i-Spiral) of up to 40 cm, with a single click, at any point during the interventional procedure. Images are reconstructed in real time and can be directly used to assess needle position in 3D viewing of coronal and

sagittal as well as axial images, which is especially important in more complex procedures, such as oblique entry in the thorax. The spiral acquisition also facilitates visualization as a VRT, a view that offers an excellent 'real life' representation of the needle position in relation to sensitive organs or vascular structures, for example.

The exceptional flexibility offered by the SOMATOM Definition AS opens the door to a range of workflow improvements with the potential to improve patient care and clinical outcomes. From drainages, to alcohol or cement flow monitoring for pain therapy, the ability to get fast and reliable 3D images in combination with features such as i-Auto Needle Detection, offers clinicians a new level of speed for daily routine plus exceptional precision and confidence for more complex procedures.



In the following case Cathrin Boehner, MD, from the University of Erlangen-Nuremberg's Department of Diagnostic shares with us her first experiences of the SOMATOM Definition AS with Adaptive 3D Intervention.

HISTORY

A 67-year-old, female patient underwent routine CT for follow-up of colon cancer. The initial staging thorax CT in 2006 revealed several metastatic lung lesions that were monitored at 3-monthly inter-

vals. Target lesions demonstrated an overall growth. Due to the size and position of the lesions, the oncology team decided that radio-frequency ablation (RFA) was the most appropriate therapy option at this stage.

IMAGES AND COMMENTS

syngo CT Oncology was used for follow-up of target lesions and sequential evaluation revealed significant growth (Fig. 1). This SW facilitates automated lesion matching, which is particularly useful in

the lung where lesions may be displaced due to differences in lung volume dependent upon breath hold. Computer calculation of growth parameters eliminates inter-reader differences in lesion size evaluation and the calculation of volume allows us to gain a better overview of the growth of the lesions as a whole in comparison to the 2D measurement alone. For RFA procedure the new SOMATOM Definition AS uniquely offers the ability to perform real time 3D interventions. The ability to instantly visualize the needle position in coronal and sagittal

planes as an integrated part of the interventional scanning workflow is very desirable for these more complex procedures, where careful positioning in relation to sensitive anatomies is vital to ensure the best possible clinical outcome. This is very often the case for lungs where oblique entry may cause issues for needle visualization when using 2D only (Fig. 2).

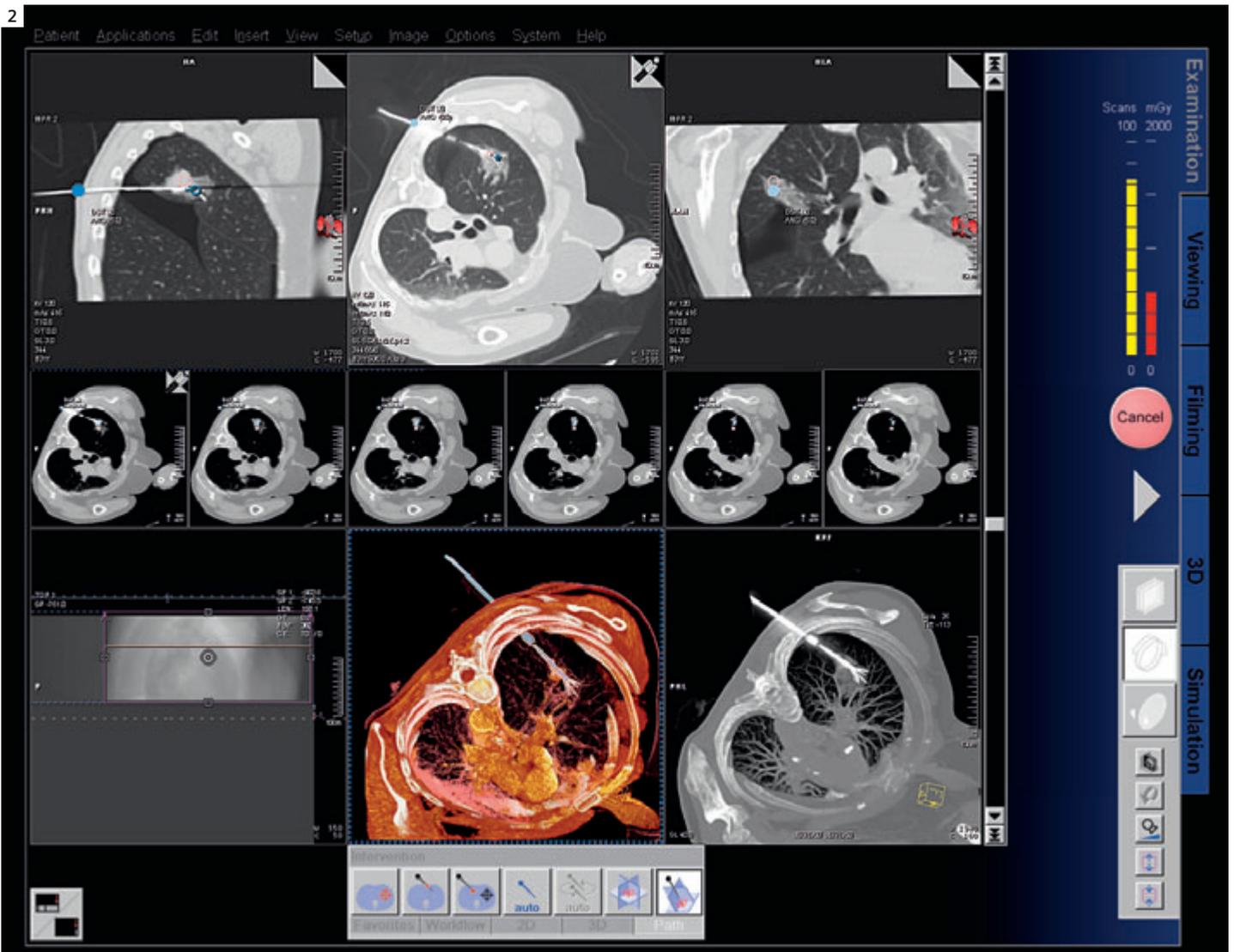
The reduction of needle artifacts proved invaluable for the ablation of the smaller lesion. At 6 mm, it could easily have been obliterated in the images due to the rela-

tively large size of the needle combined with artifacts. Applying i-NeedleSharp allowed a greater degree of accuracy for targeting the small lesion with the first shot.

Since we prefer to use a 'step-n-shoot' approach, the one-click table positioning and rapid image refresh rate, even when incorporating an interventional spiral (i-Spiral), are good for workflow optimization. An additional plus is that we can also use CARE Dose4D and HandCARE for interventional procedures. This means that we not only save dose by being more

accurate, but also through active dose management, which is a huge plus in terms of patient care.

Overall, our first experiences with the SOMATOM Definition AS have been very positive. We believe that the innovative interventional workflow will allow us to be faster in our routine cases and enhance clinical outcomes in terms of speed, accuracy and, of course, risk minimization for complex interventional procedures.



2 Auto needle detection facilitates accurate path-planning in sagittal, axial and coronal images (top). Original scan images are seen in the second row. Users can select further images such as topogram and colored VRT images for easy reference during the procedure. Images are updated in real time and the layout can be changed at the click of a button.