

Virtual
Navigator

Let the Fusion begin!
CT, MR, PET side-by-side
with Real-time Ultrasound

Virtual Navigator

Fusion Imaging



Virtual Biopsy



Virtual Navigator



Applications

New Frontiers

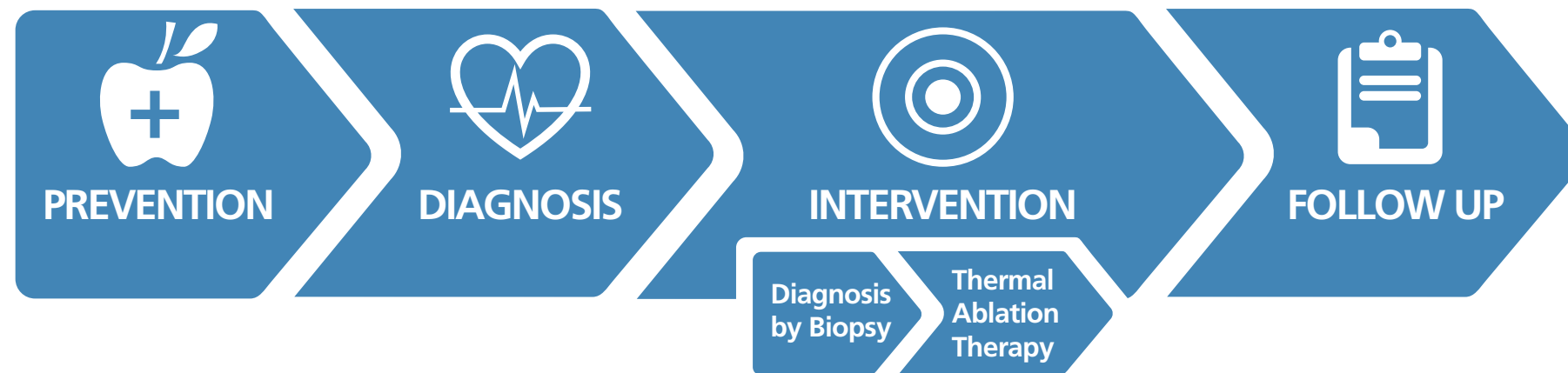


Fusion Imaging

Enhances the Real-time Ultrasound (US) information thanks to the second modality (CT, MR, PET and 3D Ultrasound) providing all the benefits of different modalities in the same exam

- Linear, Convex, Phased Array and Special Probes
- Multimodality Imaging
- Real-time Ultrasound (CFM, Elaxto and CnTI) with CT, MR and PET
- Needle Tracking and Treatment Planning: Radiofrequency, Microwaves, Laser, Cryotherapy

The perfect solution from Prevention to Follow-up!



Efficiency
Productivity
Value



Fusion Imaging

Technology

Advantages

Procedure

Probes

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Technology

The Real-time visualization of US and MR/CT/PET imaging is obtained connecting to MyLab™ and **Electromagnetic Tracking System** which register the position and orientation of the probe in a 3D environment.

Fast, Easy and Accurate tracking of the probe during the Ultrasound scanning.



Probe Adapters for Esaote probes:

Thanks to special adapters, the Esaote probes can be used in combination with the electromagnetic receiver, to correctly locate each transducer during procedures



Biopsy Kits:

Esaote probes can mount dedicated Disposable and Reusable multi-lines Biopsy kits with biopsy-lines on the screen

Transmitter: Tracking of the probe's spatial position while scanning



Receiver: Compatibility with all range of Esaote probes



Pen: The registration pen allows to register the skin markers

Fusion Imaging

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Advantages

Virtual Navigator takes advantages from all Imaging modalities and match with extended field of view, patient independence and easy interpretation (of MR, CT, PET) with Real-time, low-costs and without radiations (of US).

US

Real-time
Low cost examination
No patient irradiation

**MR
CT
PET**

Extended field of view
Not patient depending
Easy image interpretation



Increase your diagnostic confidence

Fusion Imaging

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Procedure

Few little steps...

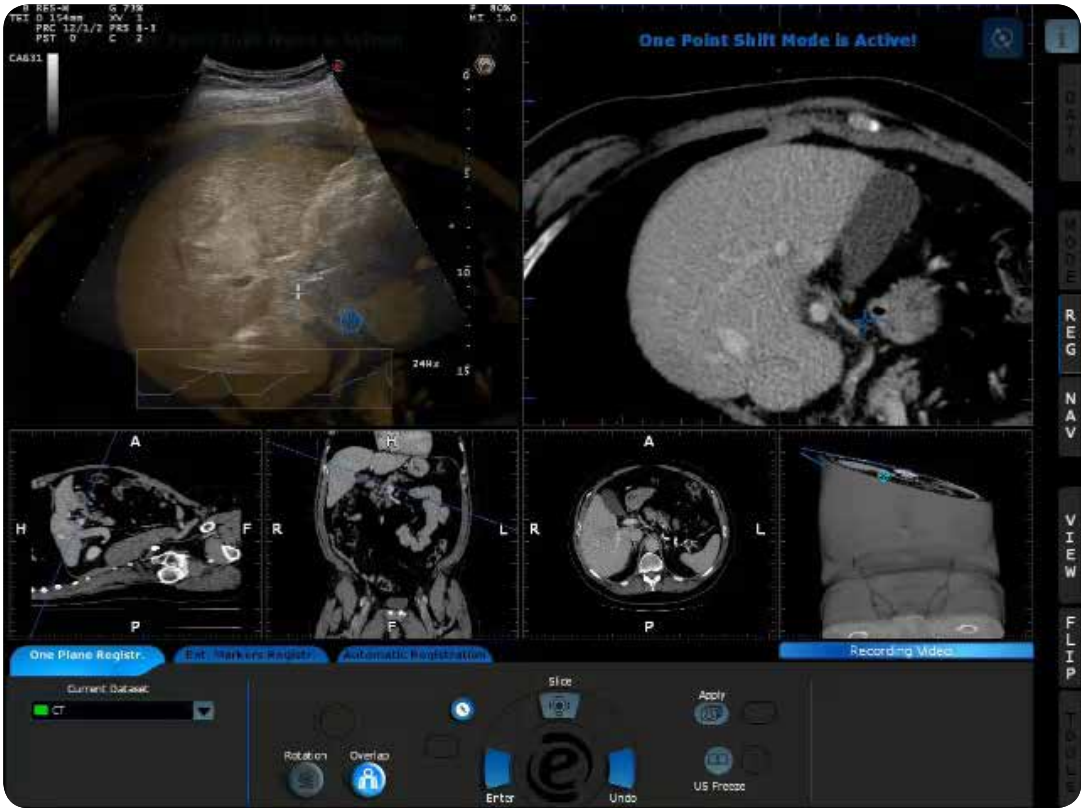
Standard Dicom/JPEG lossless Images acquired by MR, CT and PET systems, can be easily imported and fused with the Real-time Ultrasound thanks to a very easy, fast and intuitive procedure.



In case of fusion with Ultrasound Volumes (even CEUS) the registration is automatically performed by the system!

One point registration

New simplified workflow makes your registration easy, fast and accurate.



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Probes

Esaote offers the compatibility with the widest range of probes to support you during Virtual Biopsy procedures in all districts.

Special interventional probes and volumetric transducers available, in addition to a dedicated 0° Biopsy probe!

Linear



Convex



Special Probes



Fusion Imaging

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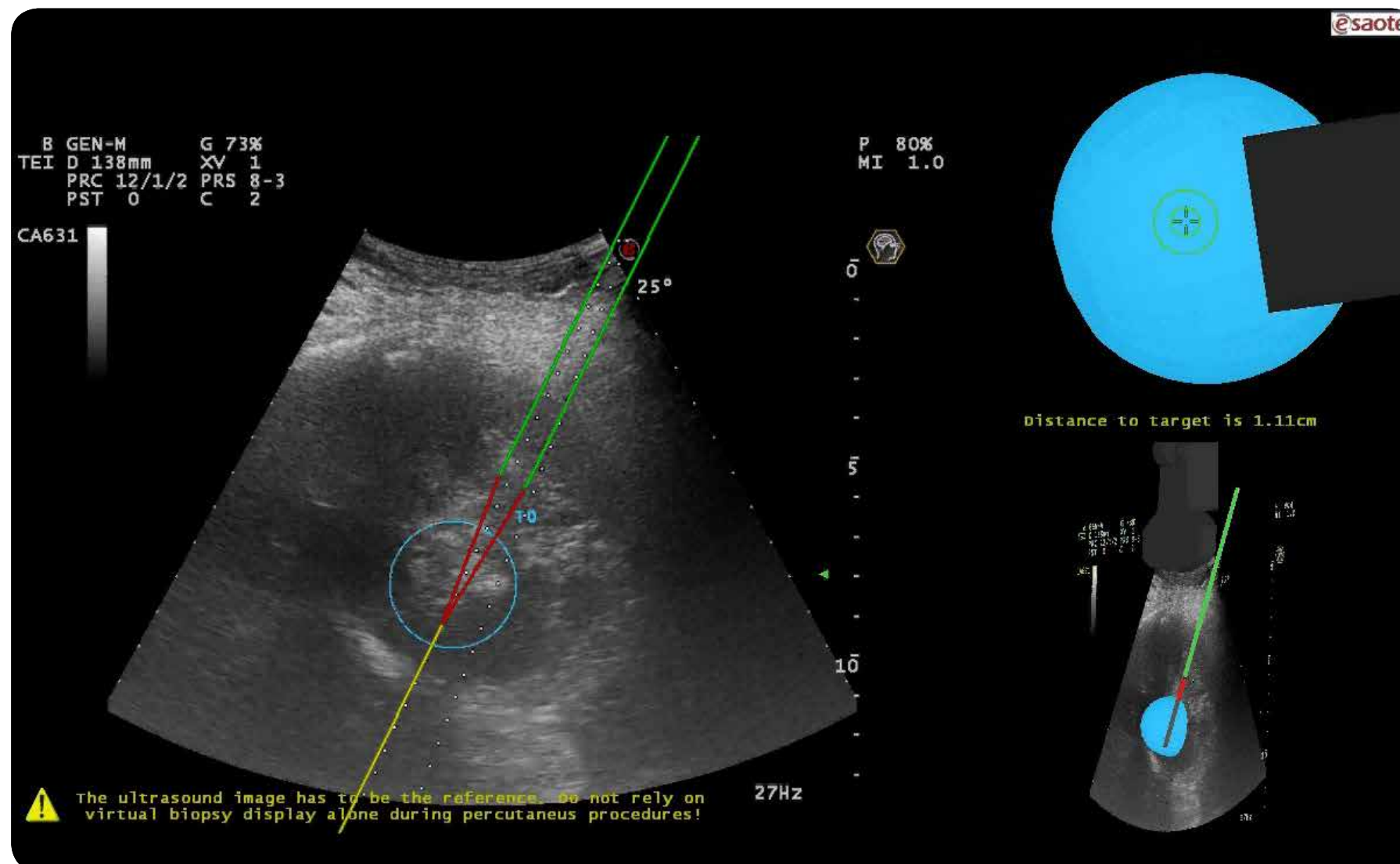
New Frontiers

Virtual Biopsy

Difficult Biopsy becomes Easy!

Virtual Biopsy allow to follow percutaneous procedure superimposing the needle tracking information on the Real-time Ultrasound image.

- Needle visualization and tracking
- Location and Detection of the lesion
- Multi-modality correlation



Fusion Imaging

Virtual Biopsy

Needle Tracking Tools: v-trax

Needle Tracking Tools: e-trax

Lesion Characterization

Image visualization

Virtual Navigator

Applications

New Frontiers

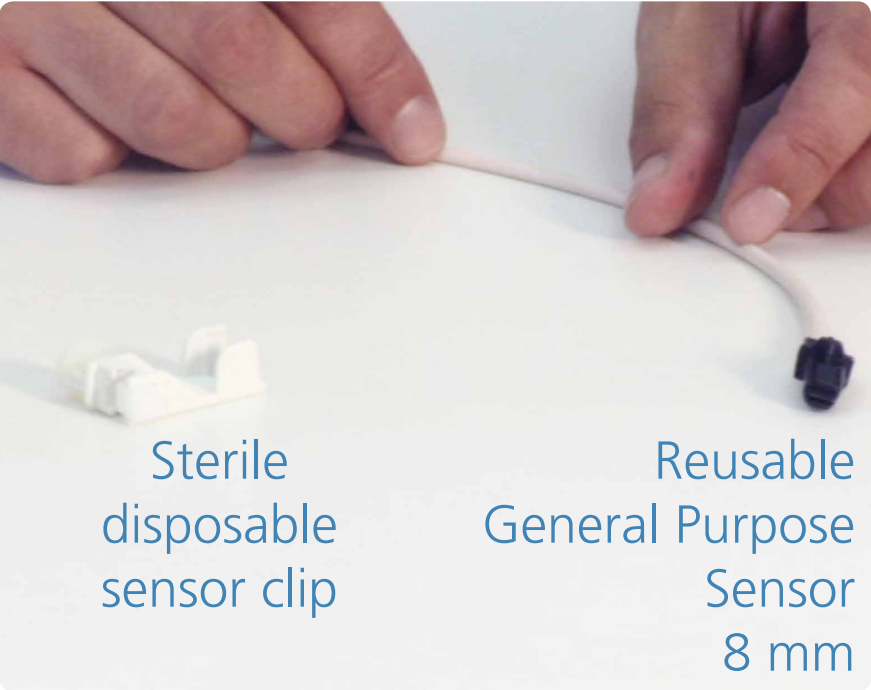
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Needle Tracking Tools: v-trax

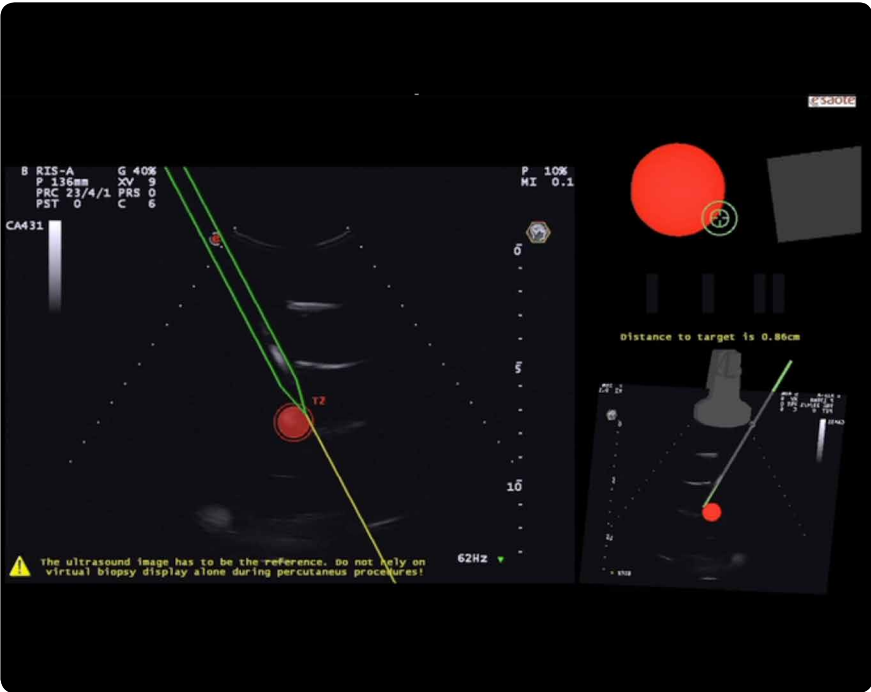
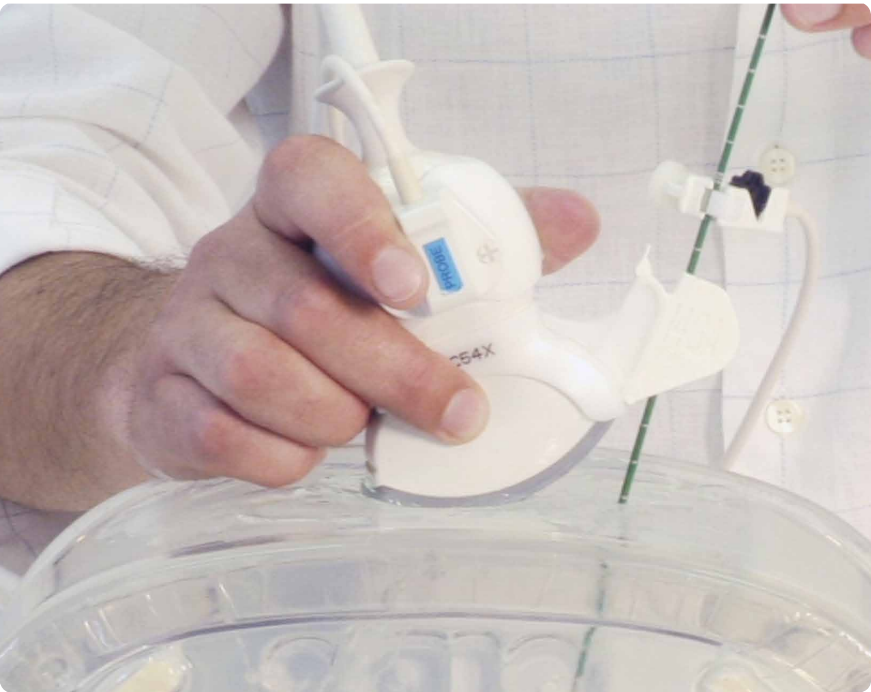
v-trax receiver kit consists of one reusable non-sterile general purpose sensor that is to be attached to a sterile disposable item secured to a rigid needle.

All kinds of needles of different companies can be used.



Sterile
disposable
sensor clip

Reusable
General Purpose
Sensor
8 mm



Fusion Imaging



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Needle Tracking Tools: e-trax

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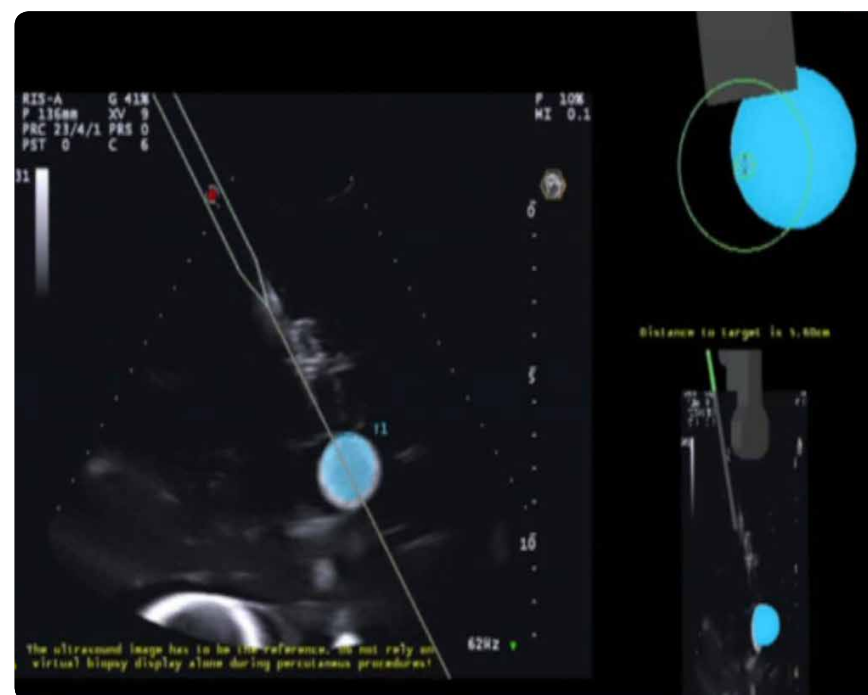
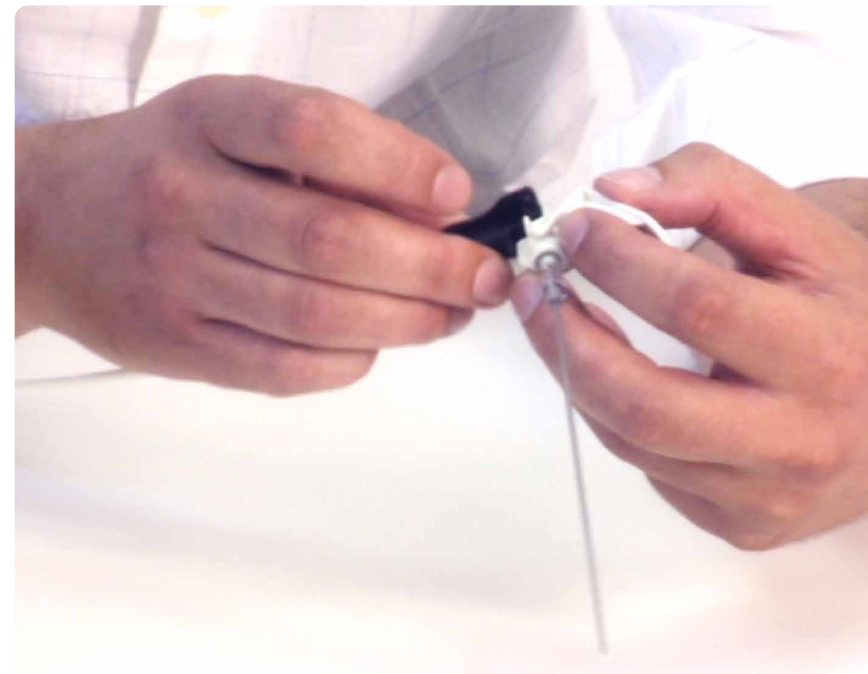
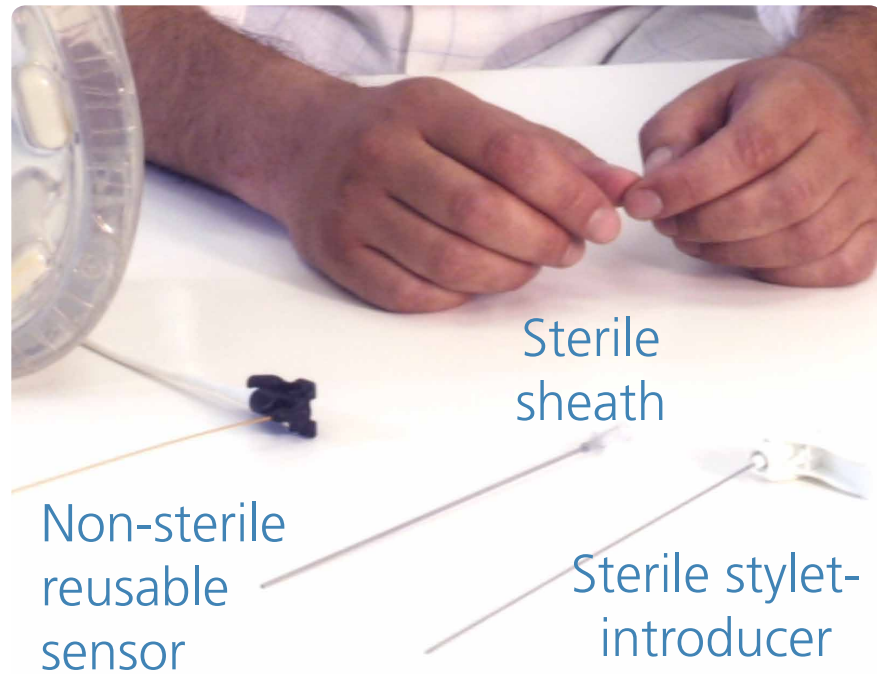
New Frontiers



Needle Tracking Tools: e-trax

e-trax allow physicians safe and precise placement of instruments by monitoring the Real-time trajectory of the needle.

The sensor is located on the needle tip and it excludes the problem of the needle bending!



Fusion Imaging



Virtual Biopsy

Needle Tracking Tools: v-trax

Needle Tracking Tools: e-trax

Lesion Characterization

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Virtual Navigator



Applications

New Frontiers



Lesion Characterization

Puncture the target using different scan approach it's easy with the Intelligent positioning:

- Precise Real-time target localization
- Decrease the number of biopsies
- Draw lesion also with irregular shapes and borders
- Possibility to perform biopsies on Real-time CEUS volumes with no special volumetric probe required!



Fusion Imaging

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Needle Tracking Tools: v-trax

Needle Tracking Tools: e-trax

Lesion Characterization

Image visualization

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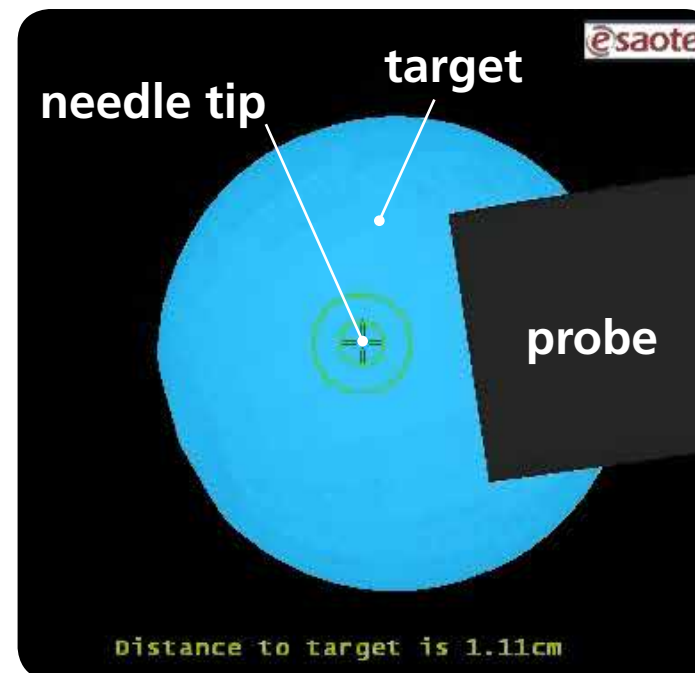
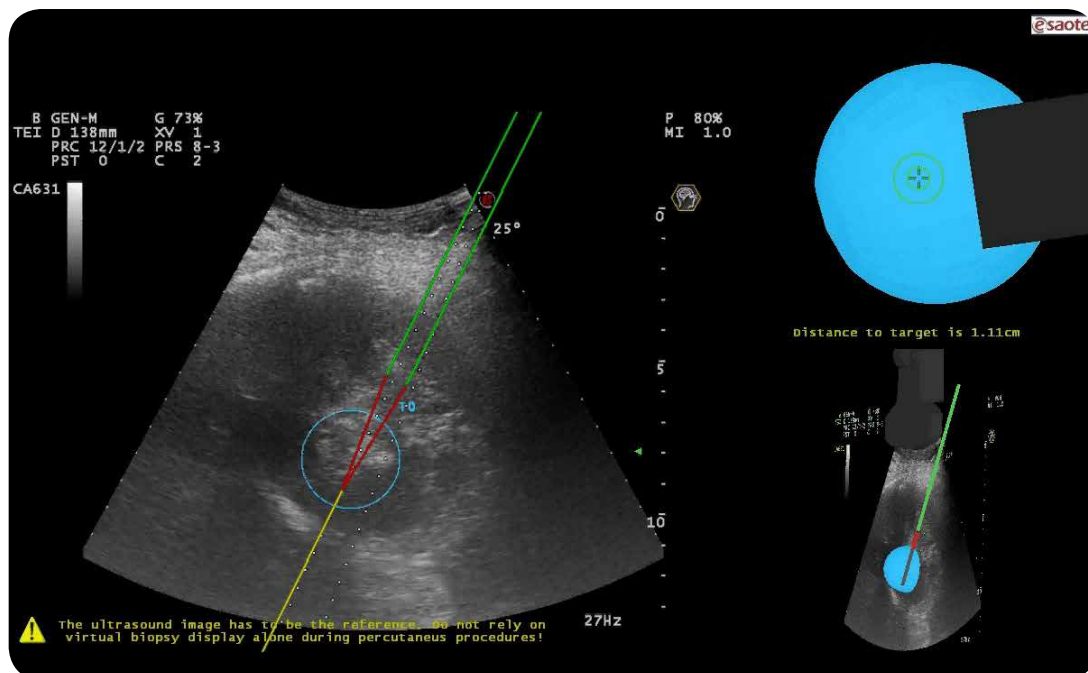
Image Visualization

With Intelligent Positioning

The real needle is highlighted by the Virtual needle in the Ultrasound window. Needle, targets, probe ad RT-Ultrasound scanning plane are reconstructed in 3D. Distance to target and directions are specified in the radar window.

The “radar window” represents a point of view from the needle tip:

- Navigate the needle to reach the selected targeted!
- Intelligent Positioning simulates a camera fixed to the needle tip, which is pointing to the needle’s tip direction: probe, lesions and probe are clearly visualized.



Fusion Imaging

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Needle Tracking Tools: e-trax

Lesion Characterization

Image visualization

Virtual Navigator

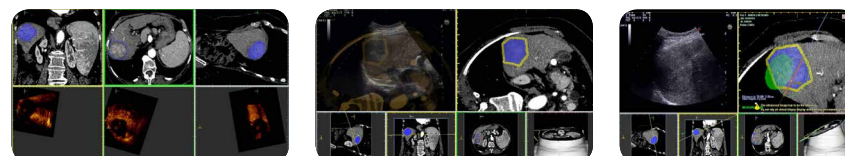
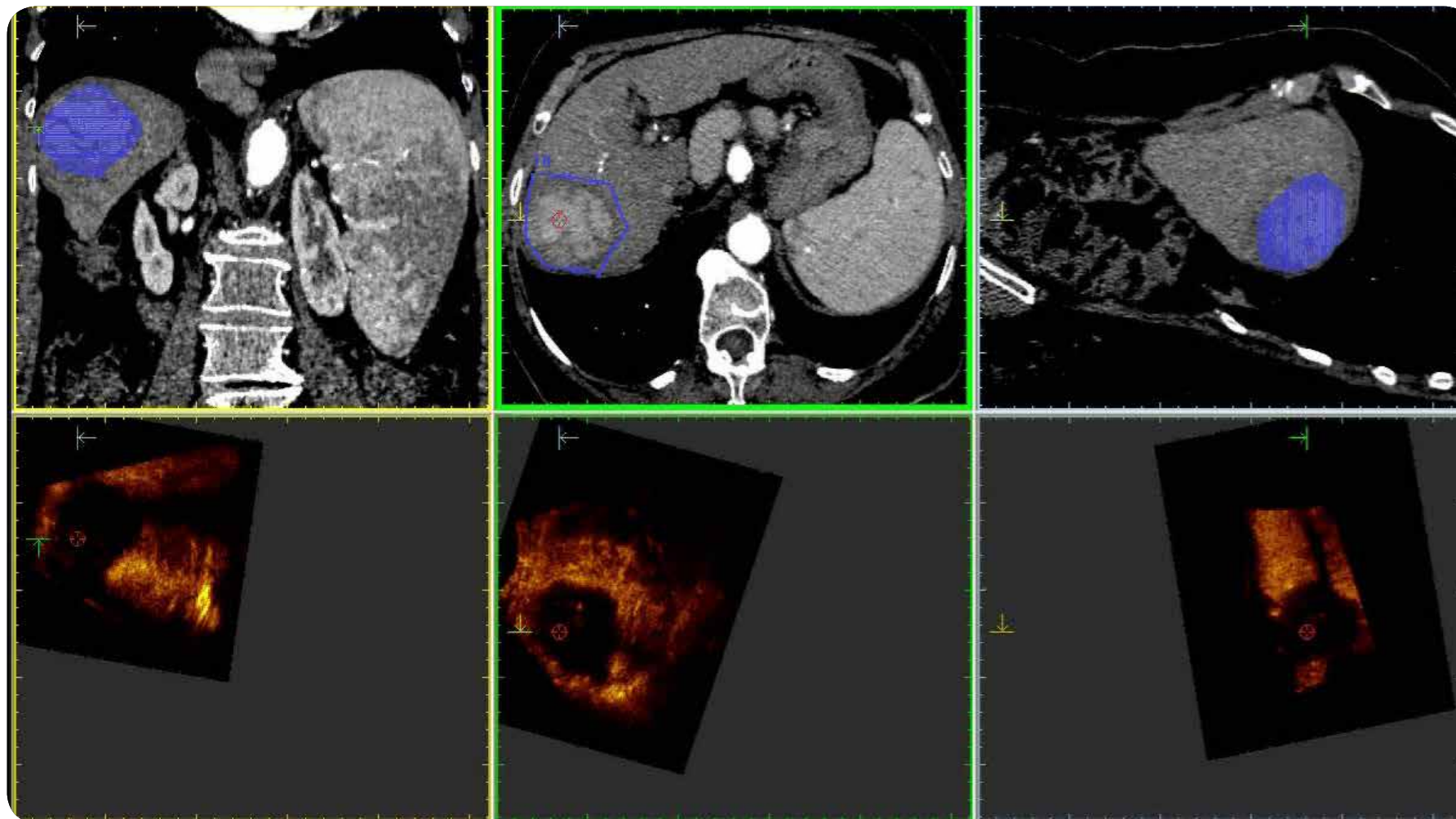
Applications

New Frontiers

From Prevention to Follow-up

Virtual Navigator is the Esaote's solution covering the full spectrum, from prevention to follow-up, through interventional therapies increasing productivity, efficiency and value.

Visualize lesions detected in CT/MR/PET not easily visible in Ultrasound



Fusion Imaging



Virtual Biopsy



Virtual Navigator

From Prevention to Follow-up

Different modality comparisons

Therapy and Surgery

3D Panoramic

Multimodality Fusion

Ablation Protocol

Applications

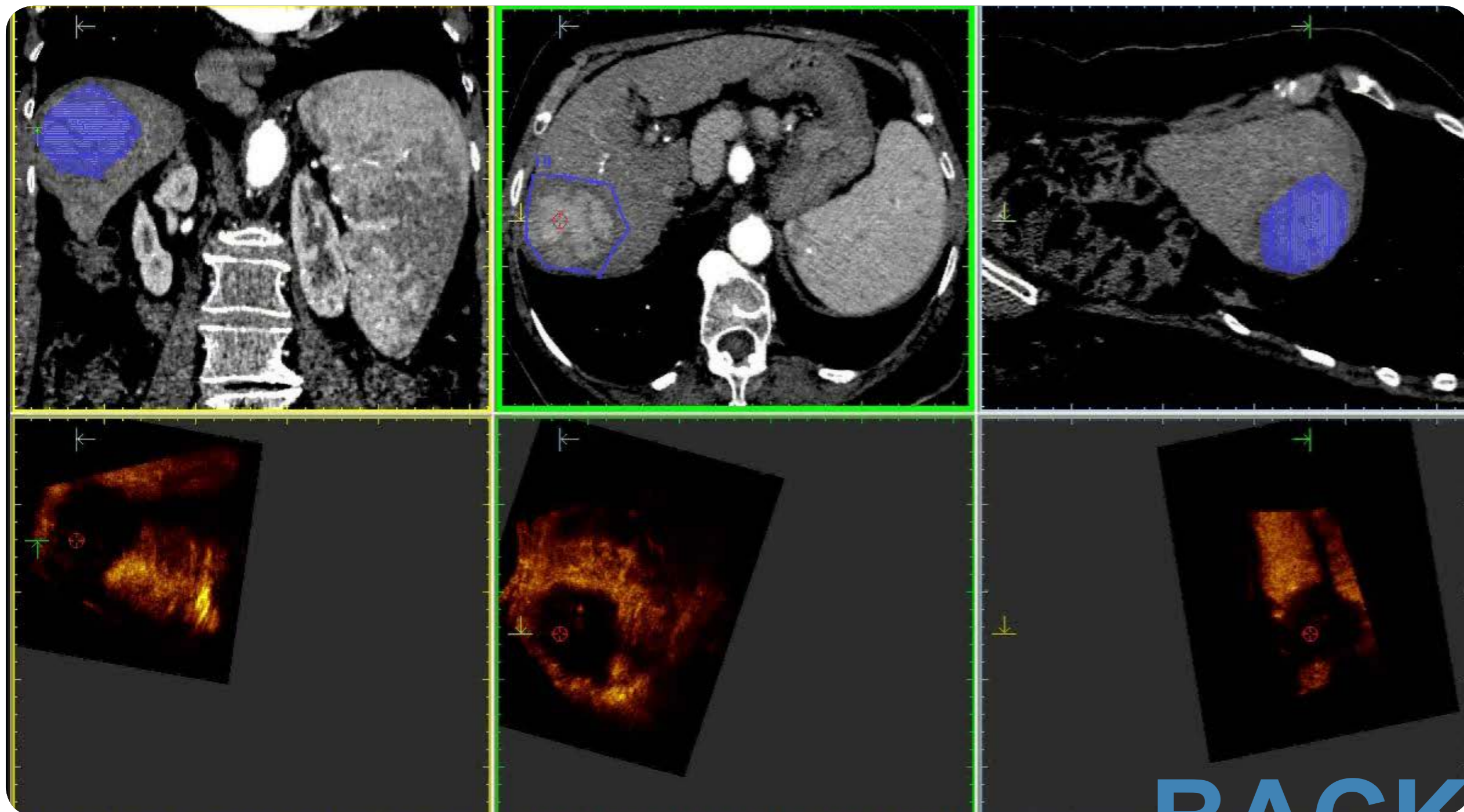
New Frontiers



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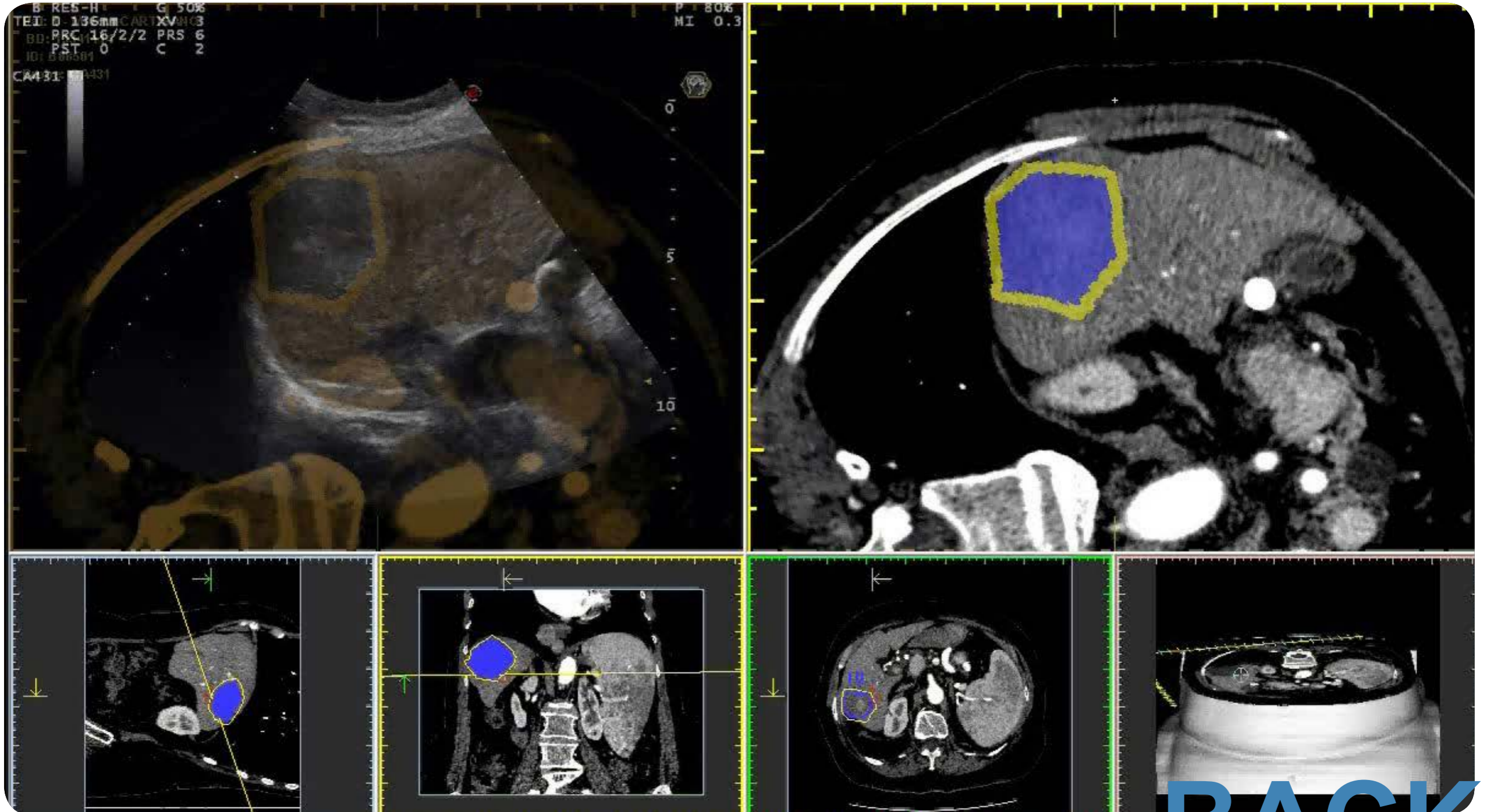
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Visualize lesions detected in CT/MR/PET not easily visible in ultrasound

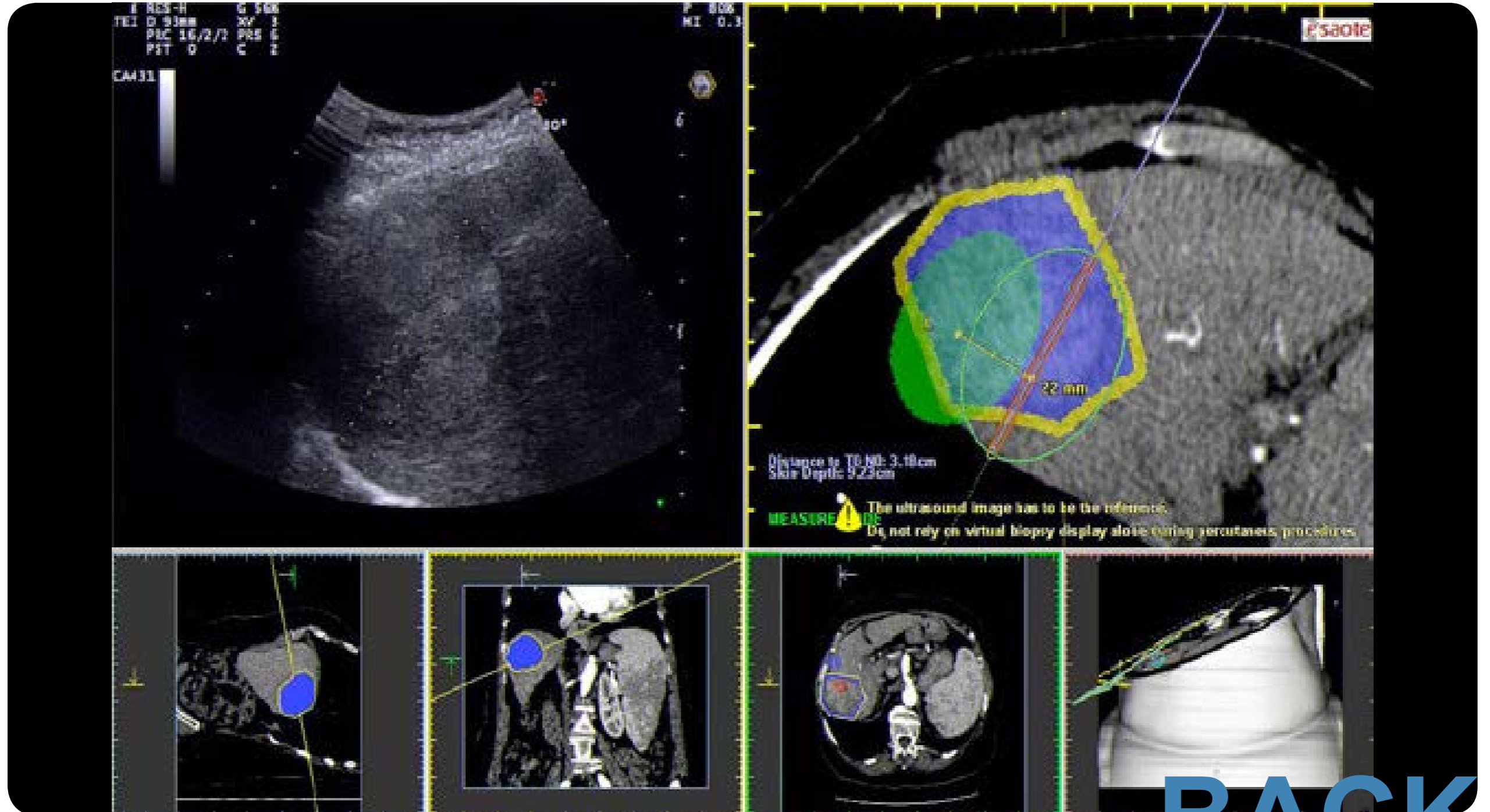


BACK

Plan the best approach in difficult-to-scan patients



Guide the operator to the region of interest easily and quickly

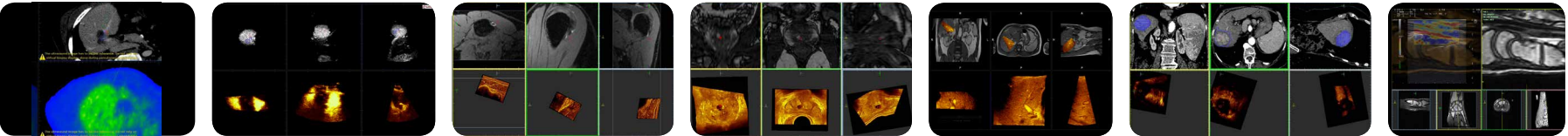
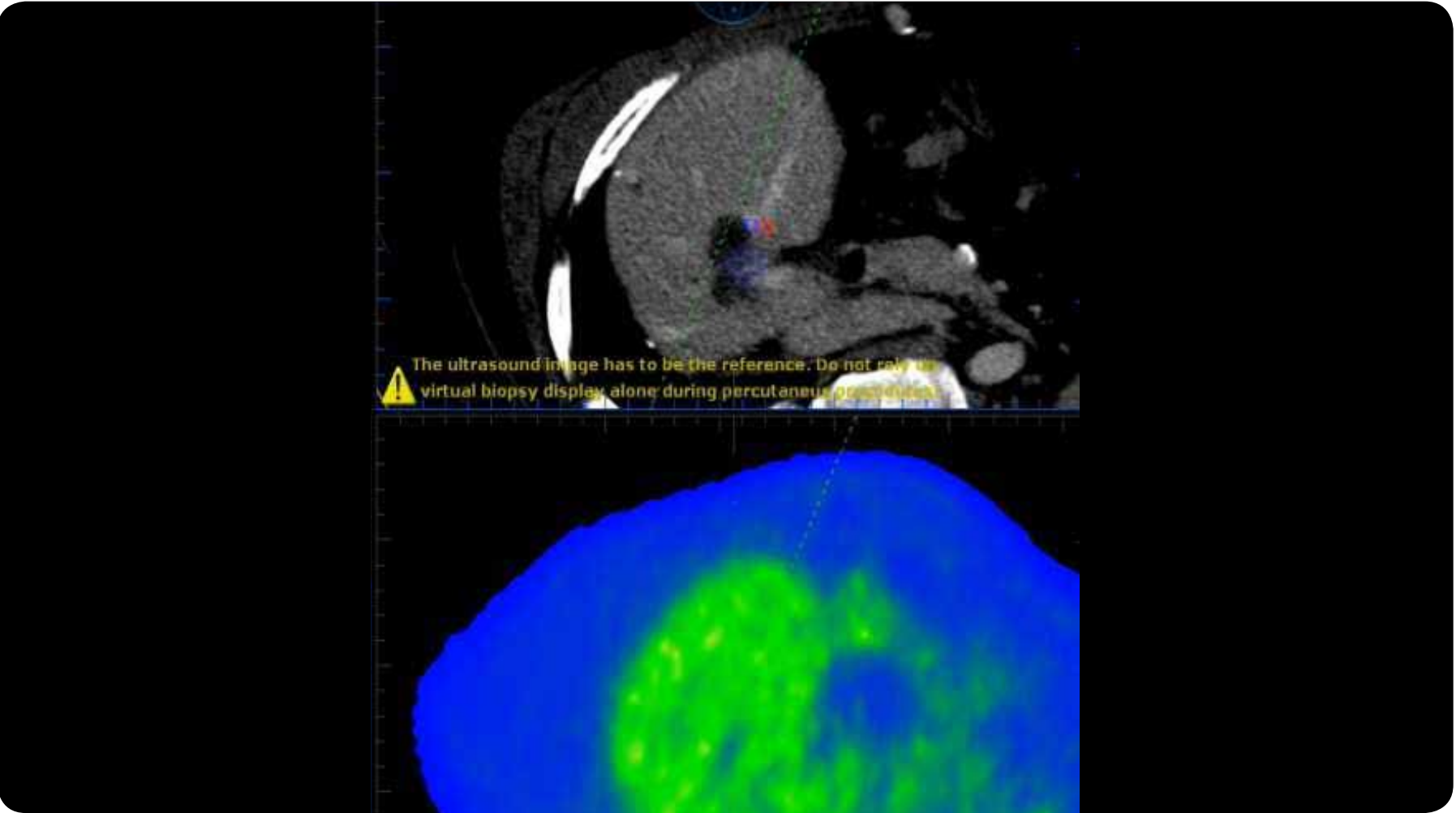


BACK

Different modality comparisons

Helps the operator, as by second modality imaging indication, to better understand the tissue's morphology under Ultrasound examination.

Offers infinites possibilities for patient's **monitoring, diagnosis** and **follow-up** thanks to the availability of Real-time Elastosonography and Contrast together with Fusion Imaging Technology!



Fusion Imaging



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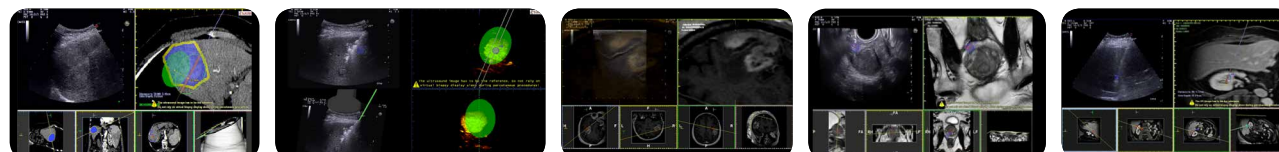
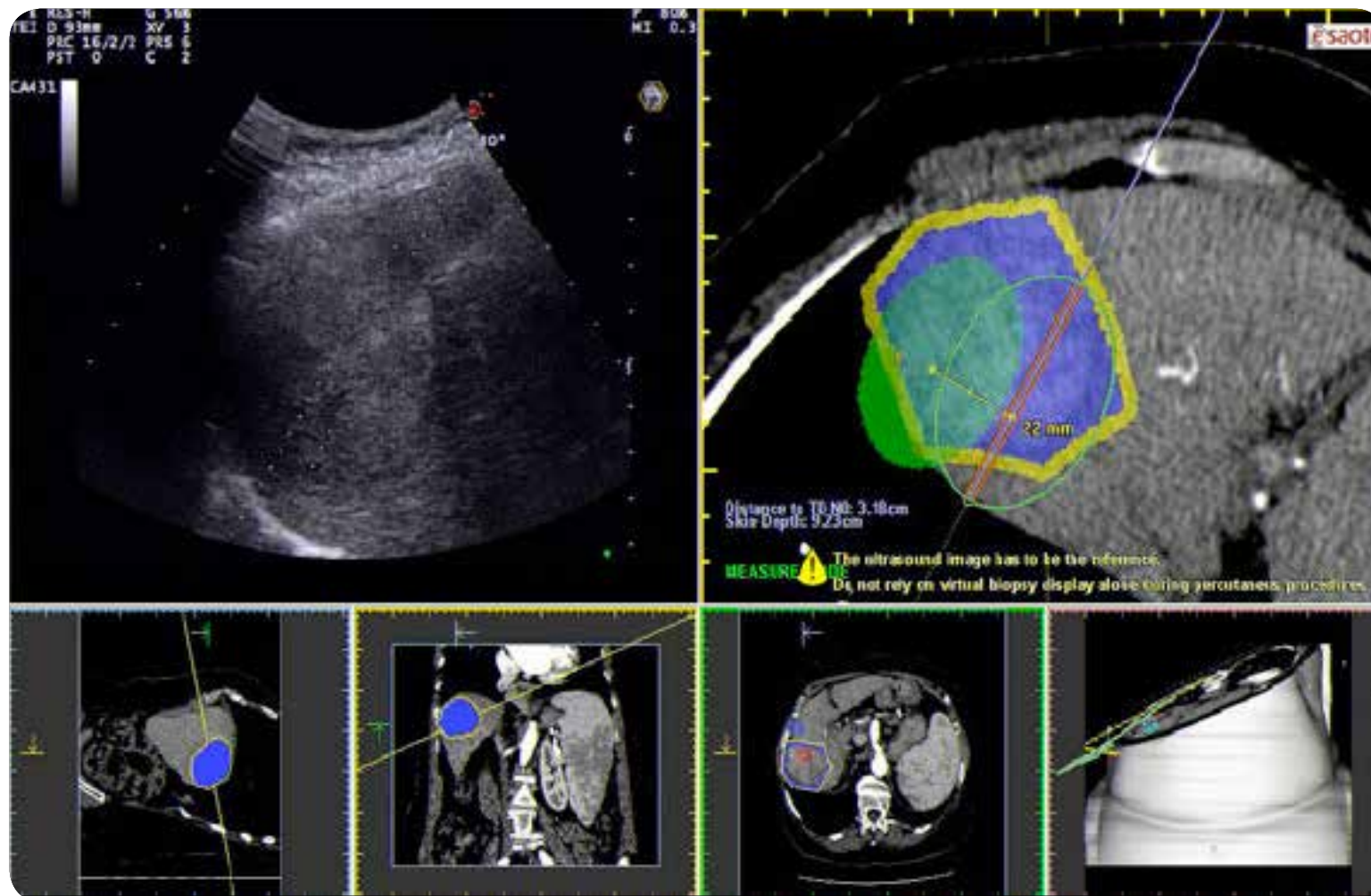


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Therapy and Surgery

Aims to support interventional procedures including lesion marking with **Automatic Registration**. This will support you in applications and especially in percutaneous procedures, Injections, Drainage, Ablations, conventional Surgery and more!

- Semiautomatic delineation of lesion margins
- Computed calculation of lesion volume
- Definition of expected necrotic ellipse
- Needle tracking capabilities



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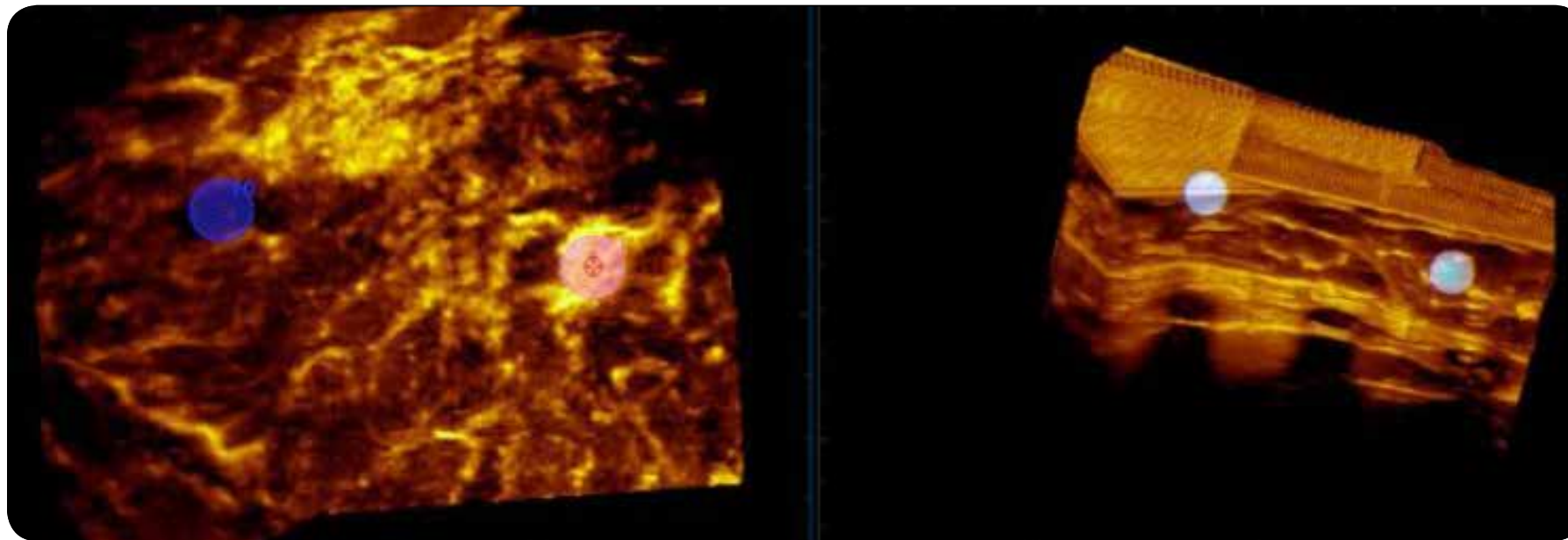


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3D Panoramic

3D Panoramic allows the user to acquire 3D images on extended multiple volumes. The final image is composed by consecutive volumes placed side by side thanks to a special rendering algorithm.

You just have a look, the Virtual navigator will show you the Panorama!



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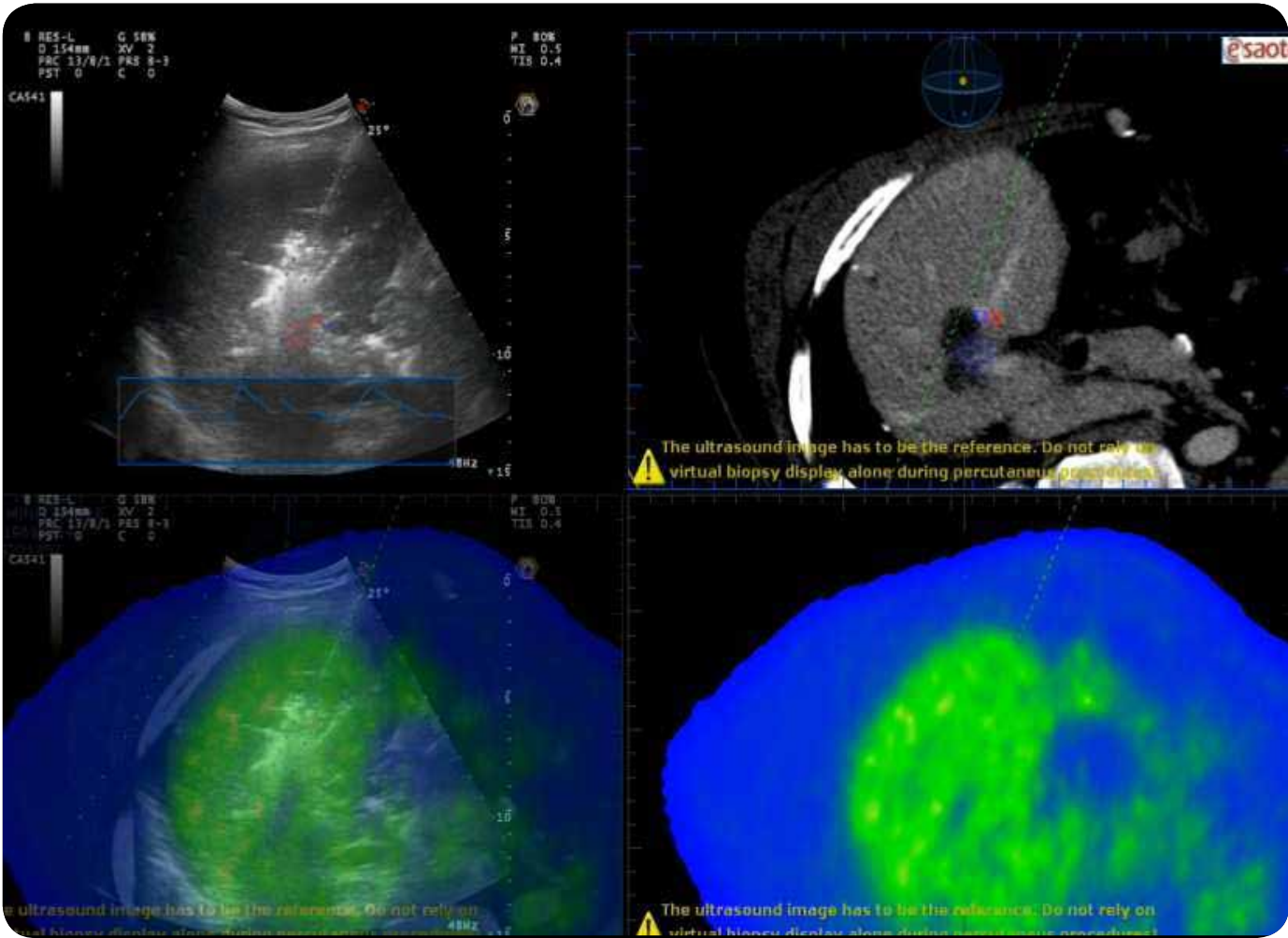
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Multimodality Fusion

Don't limit yourself into one one or two modalities, but increase instead your confidence with 3 modalities fused together... **All in One window!**

Ultrasound

CT



Ultrasound overlapped
with PET or CT

PET

Fusion Imaging



Virtual Biopsy



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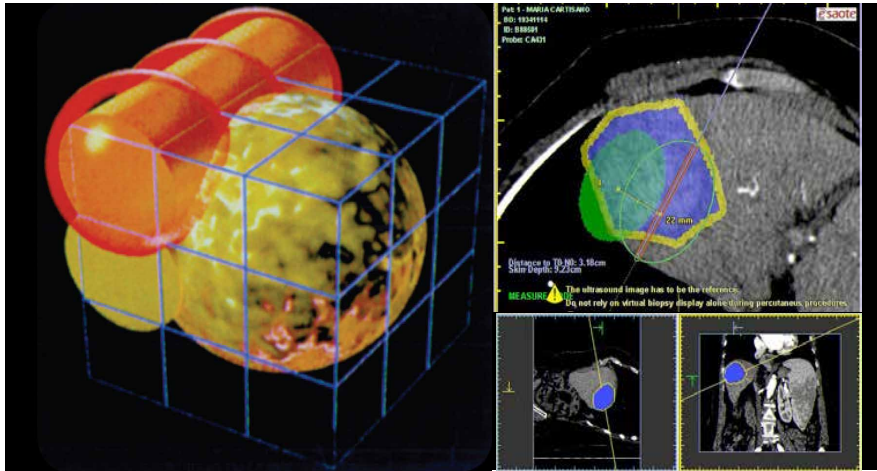
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Ablation Protocol

A dedicate environment has been developed to assist you during Cryotherapy, Radiofrequency Microwaves and Laser Ablations.



Virtual Navigator is dedicated to the interventional and ablation procedures:

- Semiautomatic delineation of lesion margins
- Computed calculation of lesion volume
- Definition of expected necrotic ellipse
- Needle tracking capability for most common needles

Universal Protocol for all needle's Companies!

Fusion Imaging



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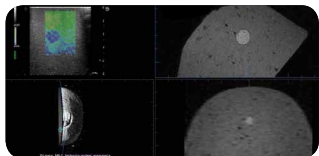
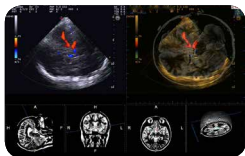
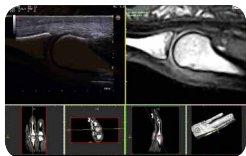
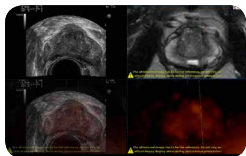
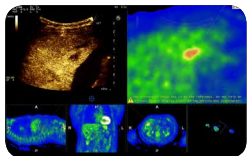
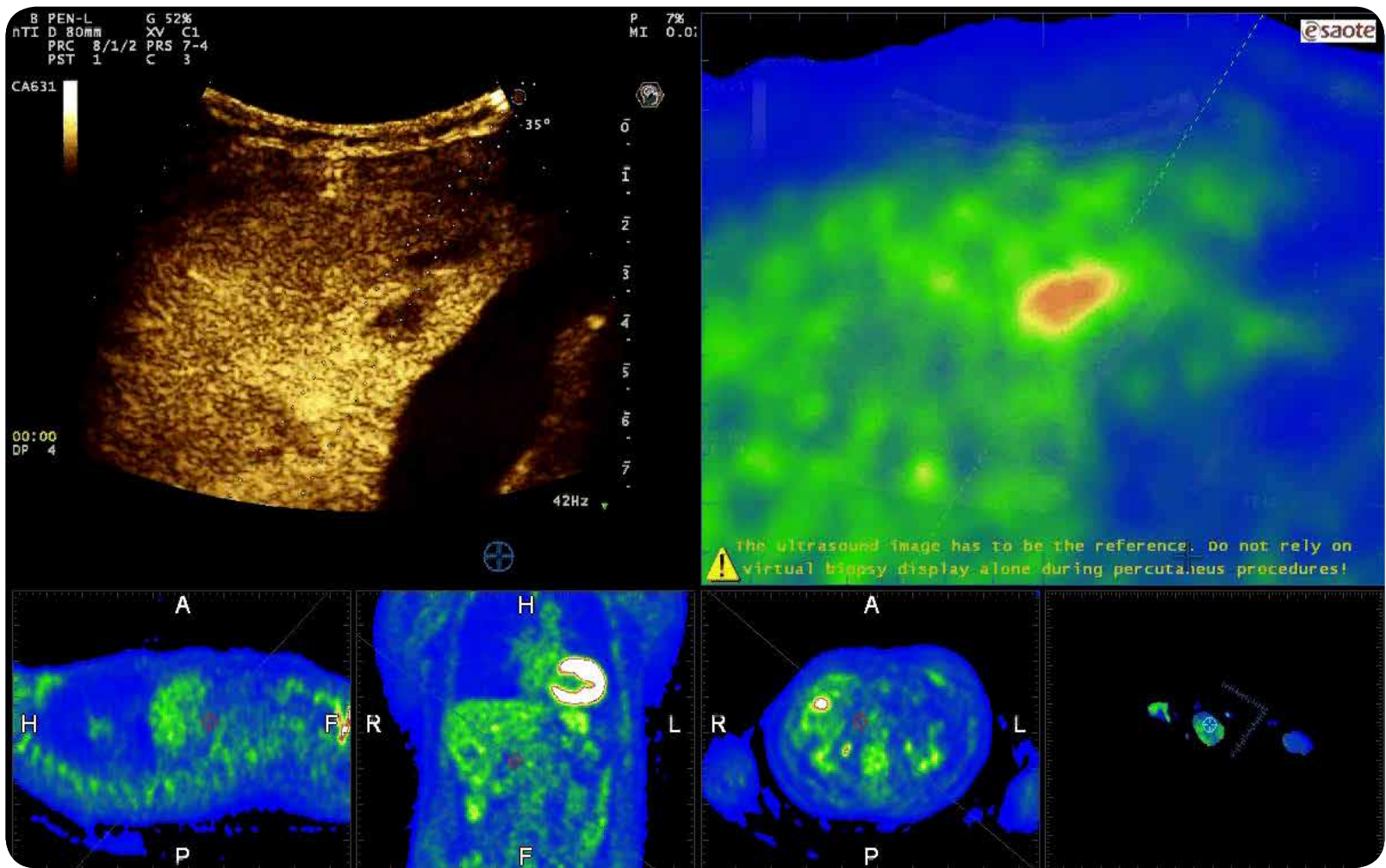
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Applications

CT, MR, PET side-by-side with Real-time Ultrasound

Esaote's Virtual Navigator-Fusion Imaging is compatible with several probes and available for a wide range of applications, from daily routine to advanced research.

Interventional Radiology



Fusion Imaging



Virtual Biopsy



Virtual Navigator



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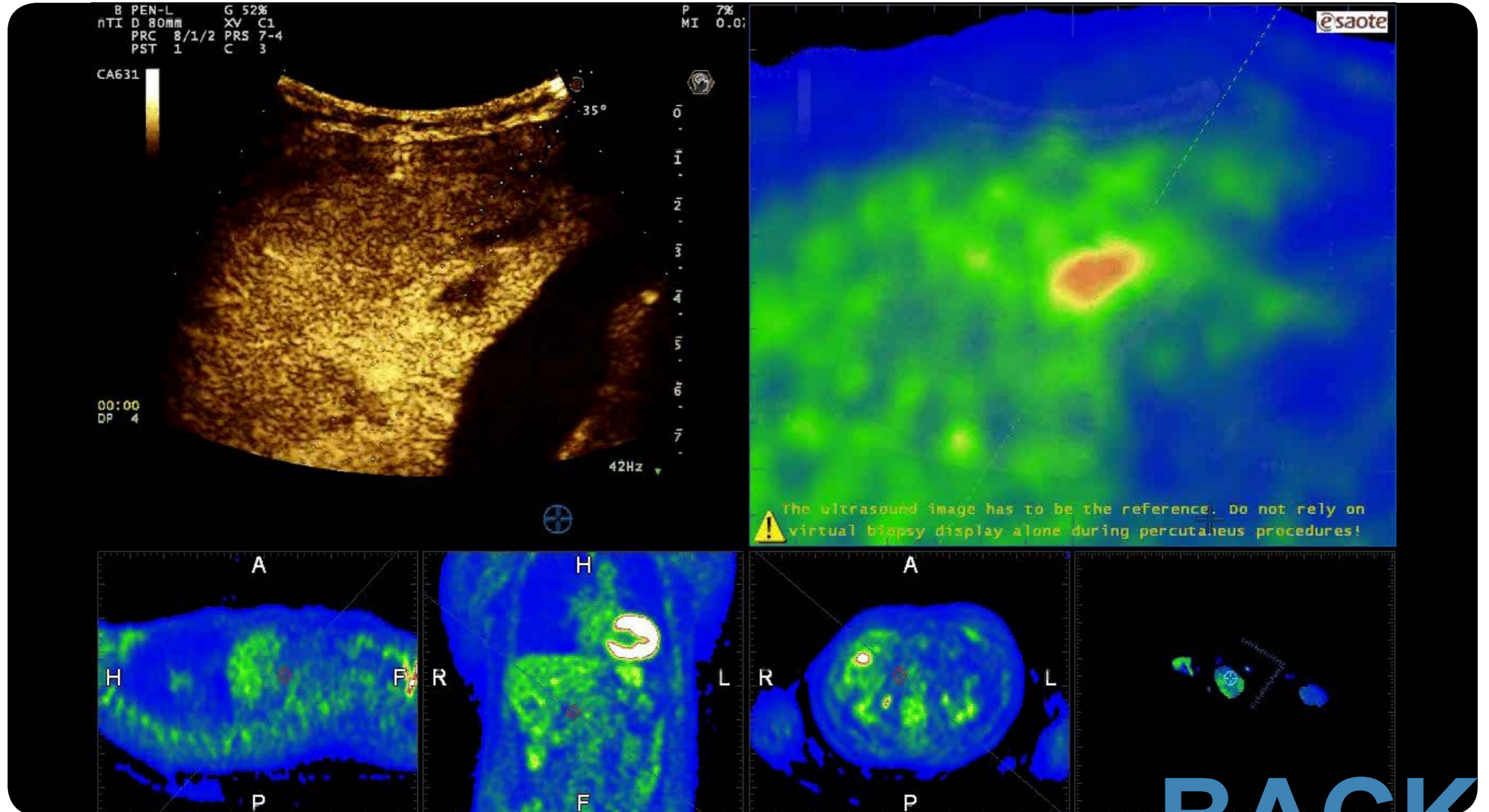


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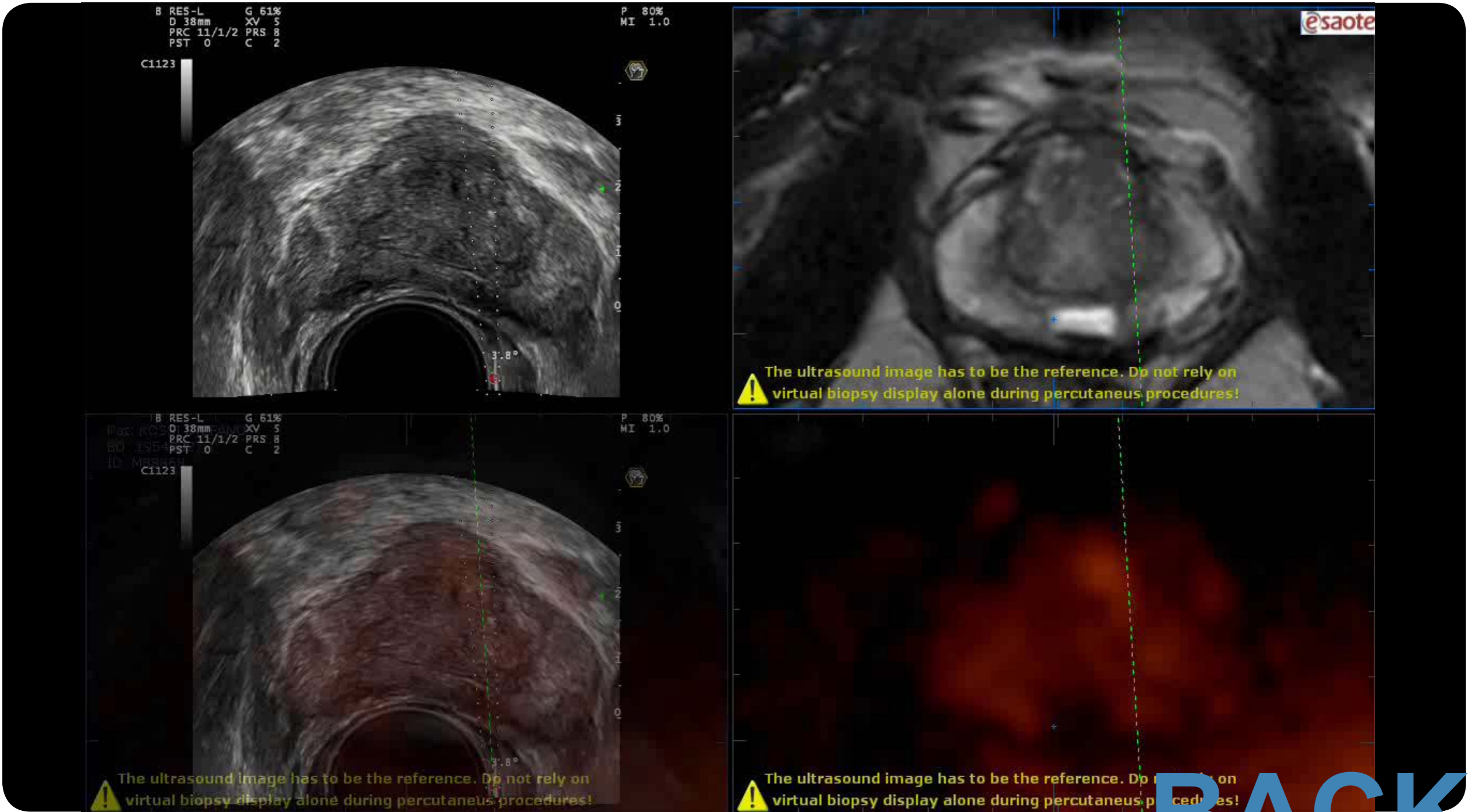
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Interventional Radiology



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Urology

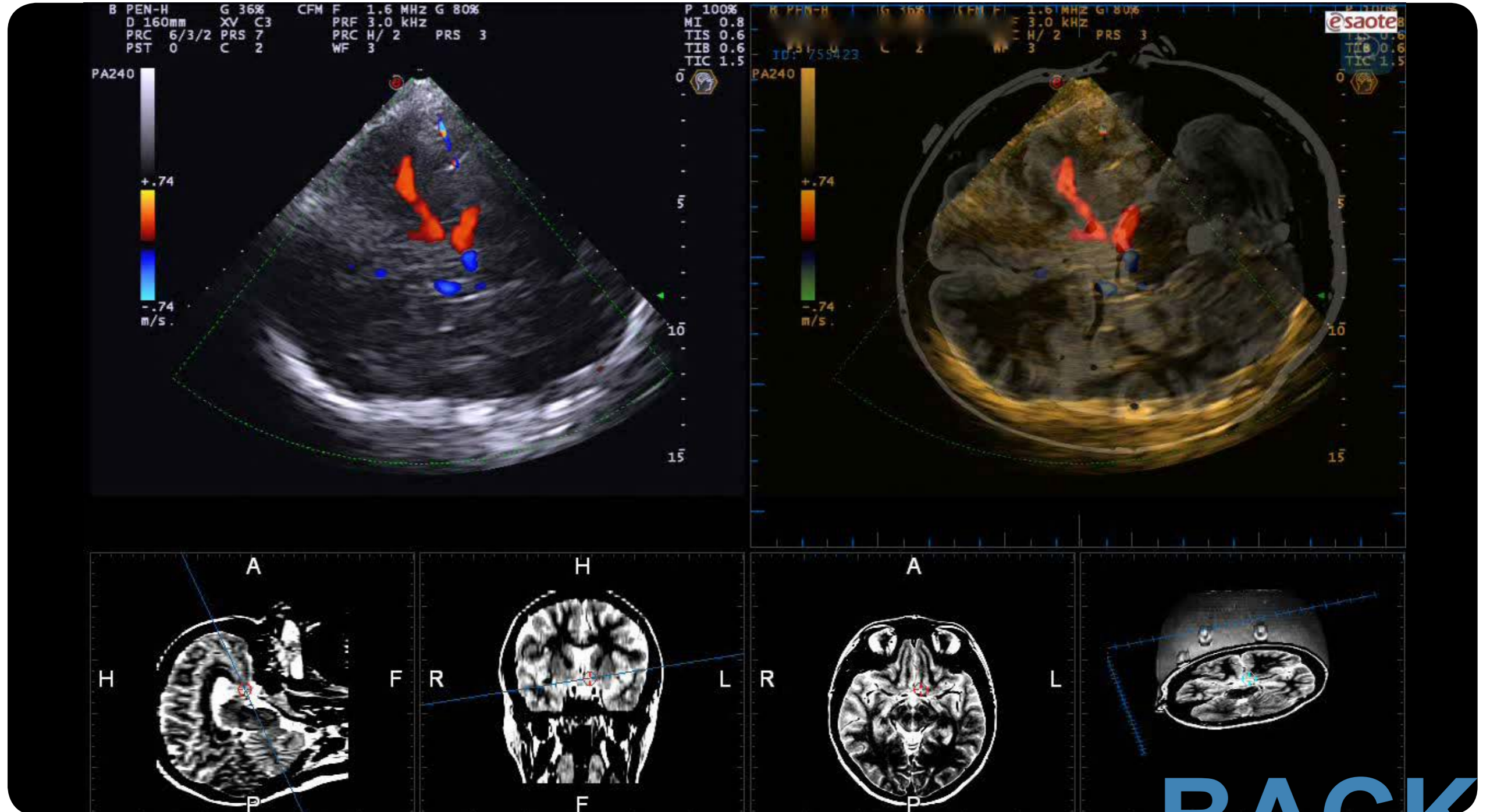


Muskuloskeletal



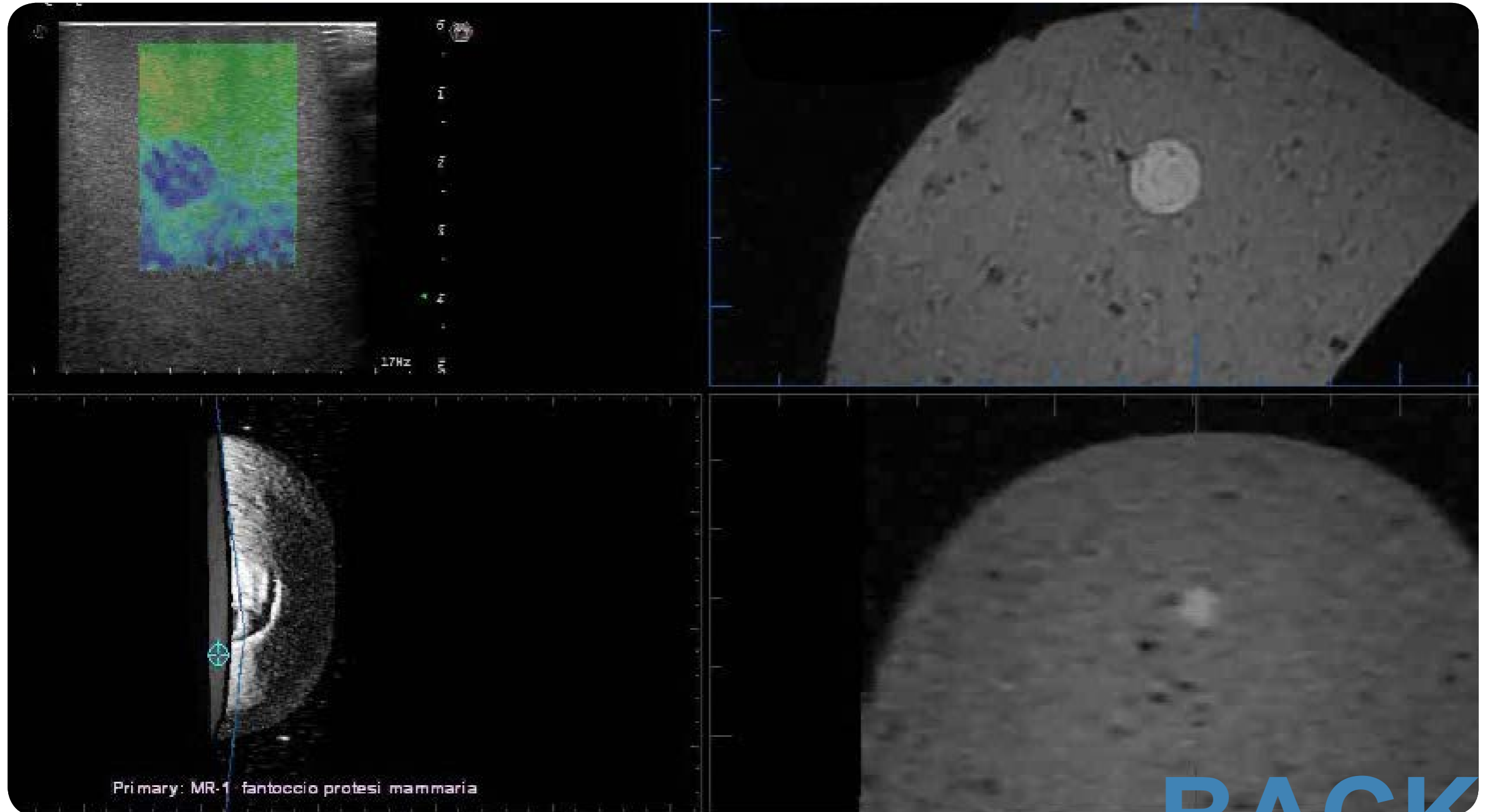
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Neurosonology



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Breast

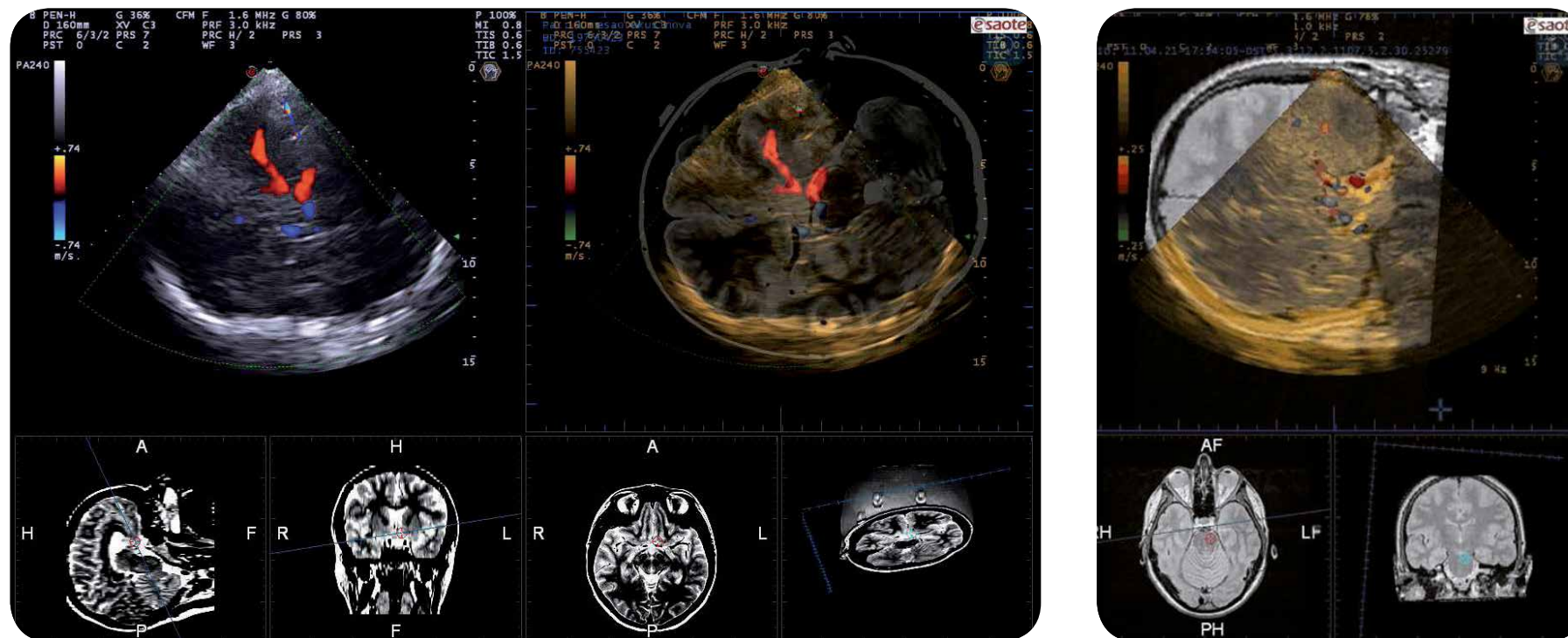


BACK

New Frontiers

The Fusion of US with MR volume creates a complete high quality picture, that allows to set the insonation planes and the vessels targeted by Ultrasound into the anatomical volume of the MR. Brain Navigator is an integrated solution that permits a true Real-time feedback during surgery with less expensive and time consuming approach than other intraoperative imaging techniques. Such an advanced and clever technology as shown to have the potential to be used both in Research and Teaching fields, as well as during everyday clinical activity.

- Fast calibration
- Real-time check by US
- Possibility to manage brain shift and patient movements
- Real situation after lesion removal
- Cost reduction



Fusion Imaging



Virtual Biopsy



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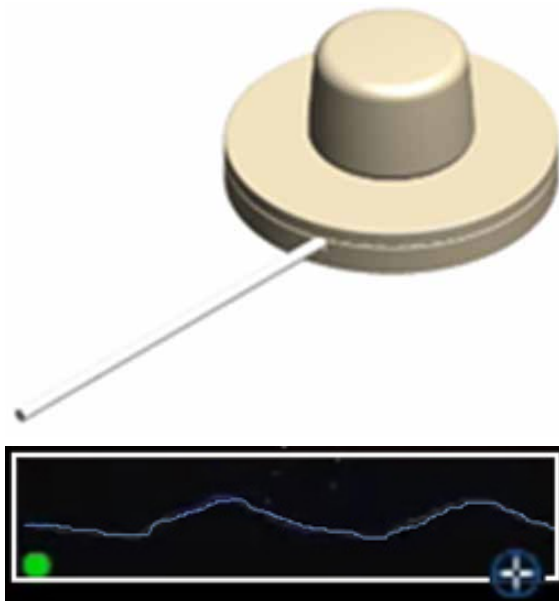


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Special Tools



A 1.8 mm **Sensor** is now available to track patients movements. Applying this sensor on a region of the scan area is possible maintain the registration even after patient or transmitter movements.



The reading of a **Motion Sensor** position placed on patient abdomen is able to generate a breathing trace to over imposed in the below part of US image.

The activation is done by mean the Physio button and the user can select to use the sensor as Movement sensor or like a respiratory gating.



omniTRAX allows physicians to quickly and accurately register patient anatomy (CT volume data sets) eliminating a tedious manual image registration. When placed on the sternum omniTRAX can be used to synchronize images for viewing the needle path with a moving target.

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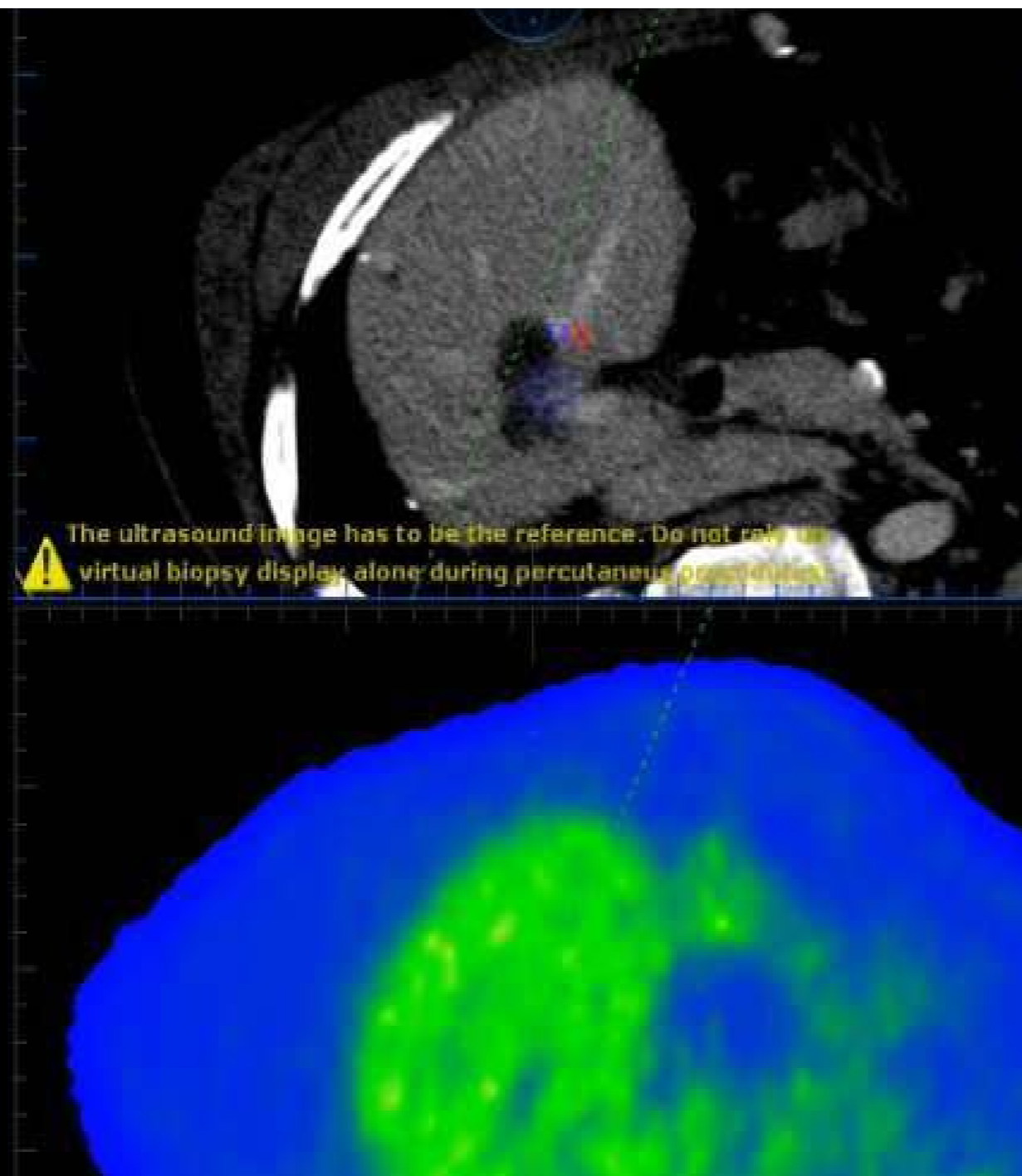
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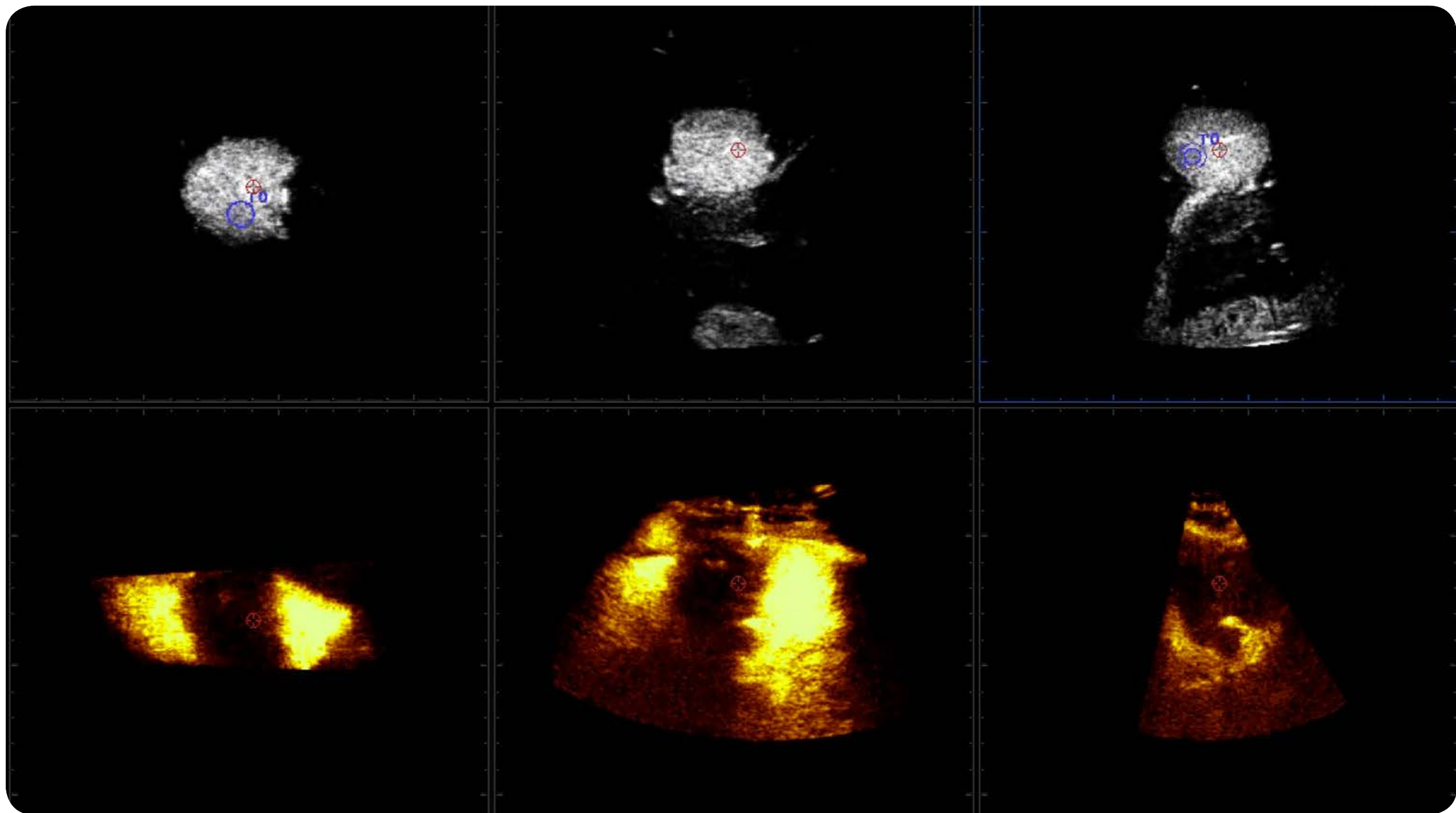
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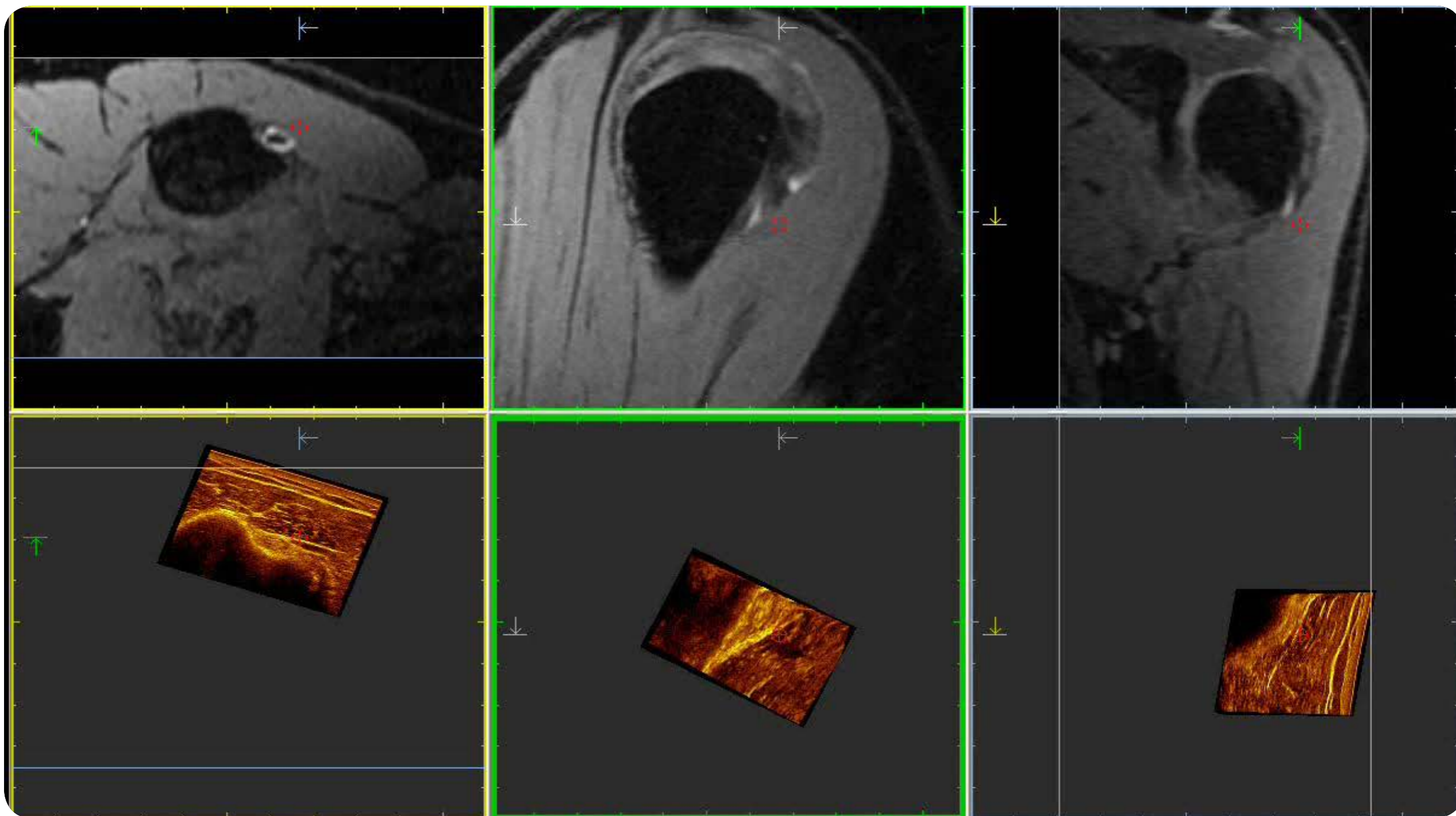
Technology and features are system/configuration dependent.

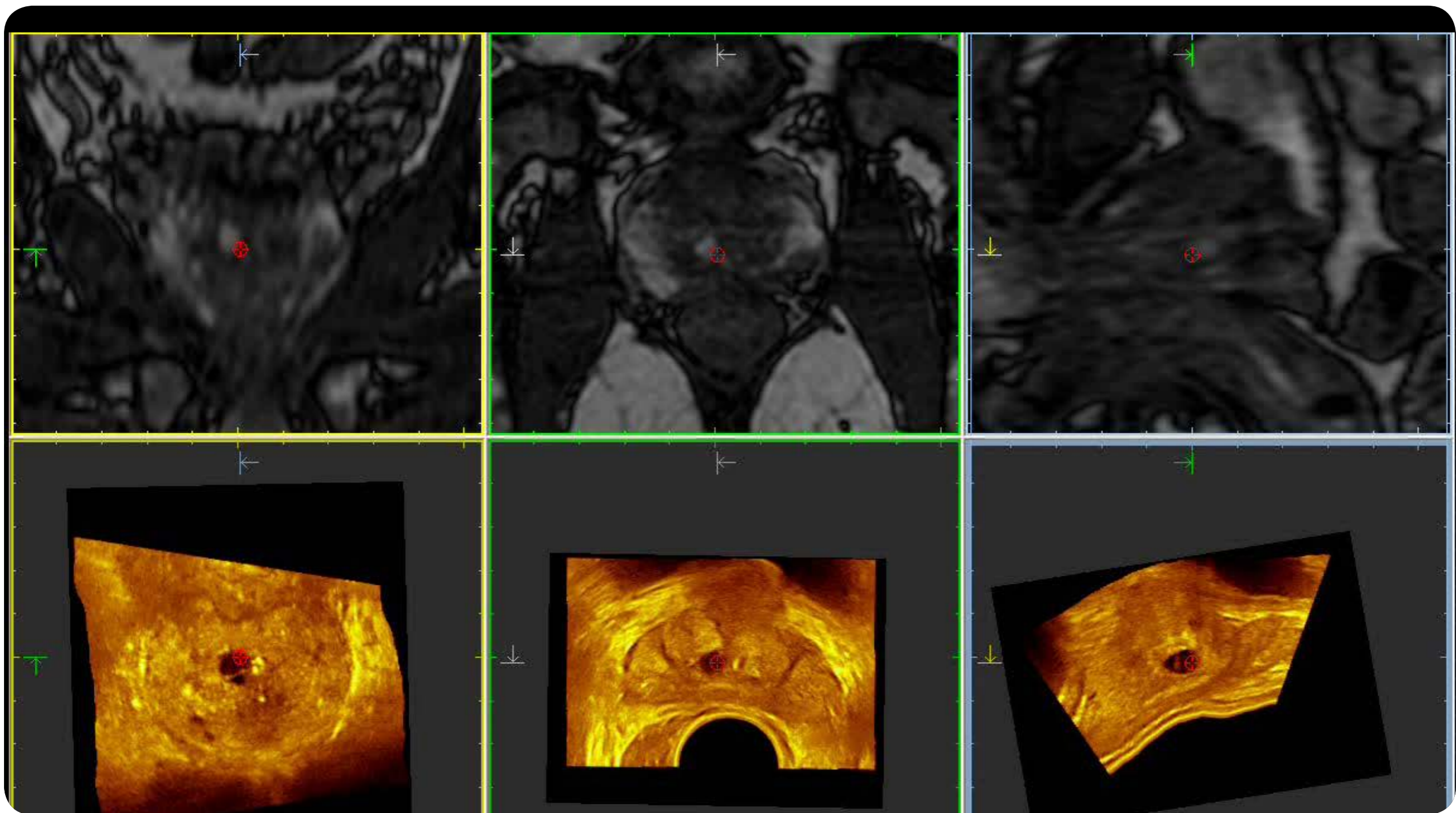
CnTI™: The use of Contrast Agents in the USA is limited by FDA to the Left Ventricle opacification and visualization of the Left ventricle endocardial border.

Specifications subject to change without notice. Information might refer to products or modalities not yet approved in all countries.

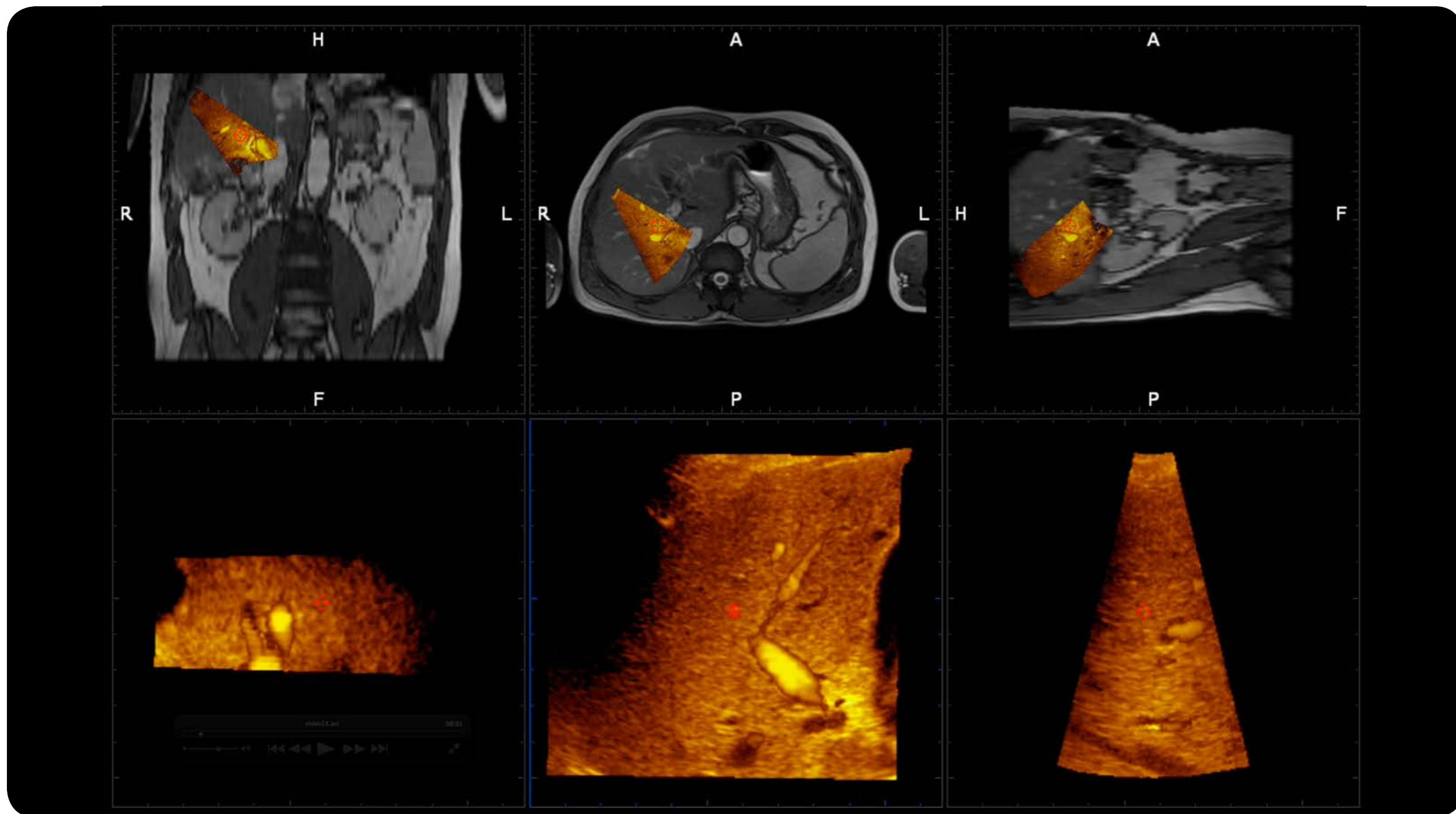




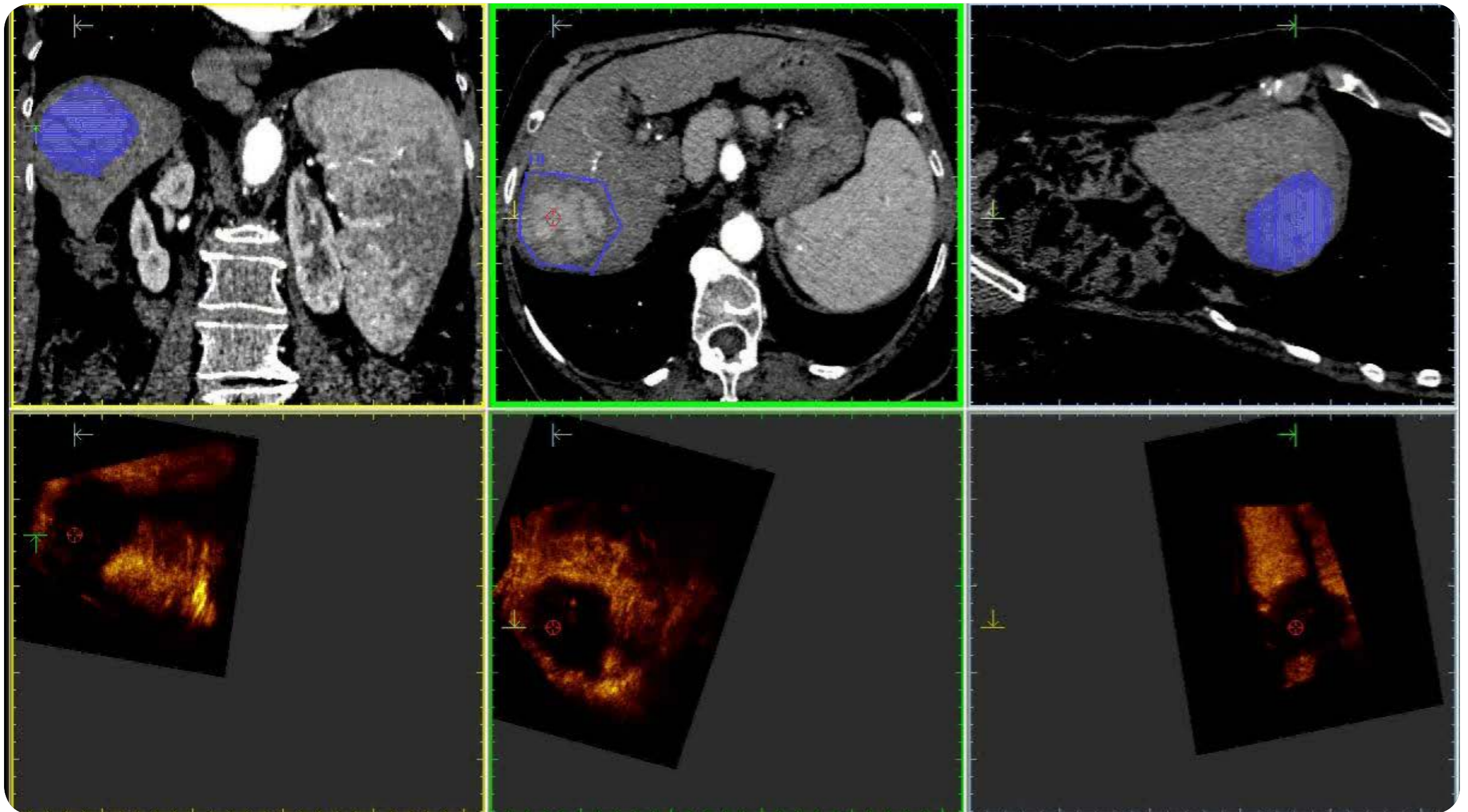




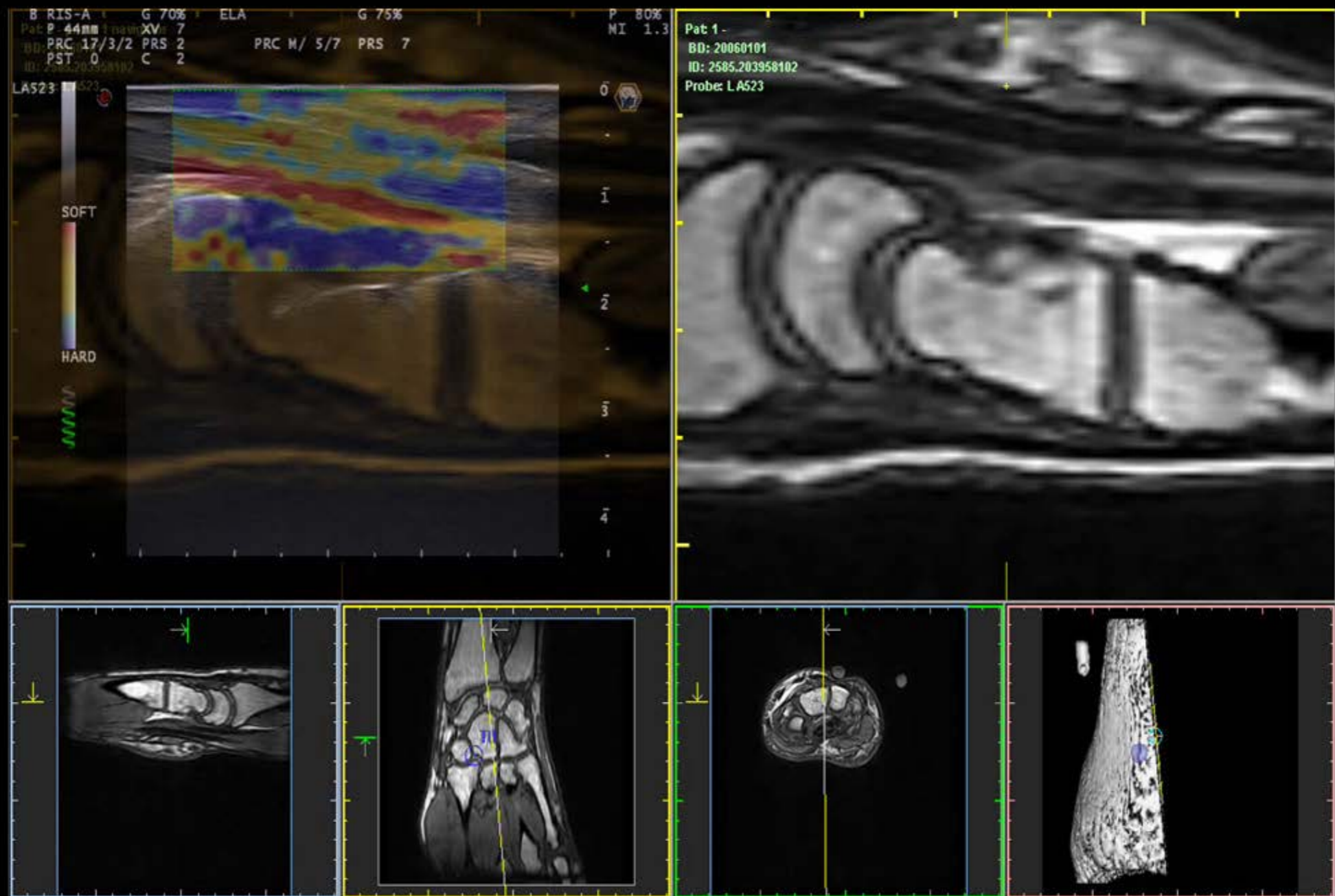
Necrosis Area Evaluation - 3D CEUS with CT



Lesion Detection and Extinction - 2D CEUS with CT



ElaXto RT with MR



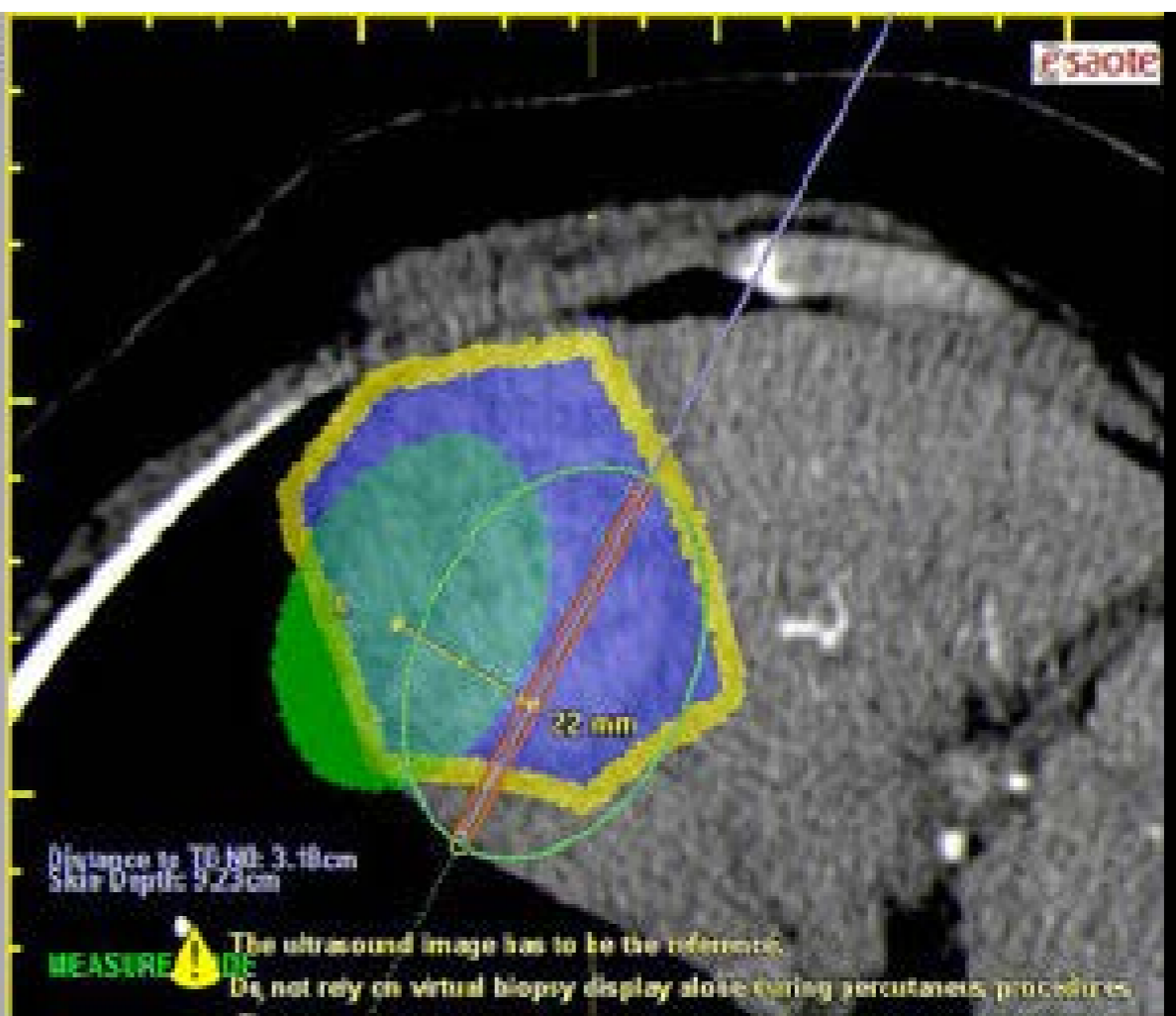
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PAC 16/2/1 PPS 6
PST 0 C 1


CA431

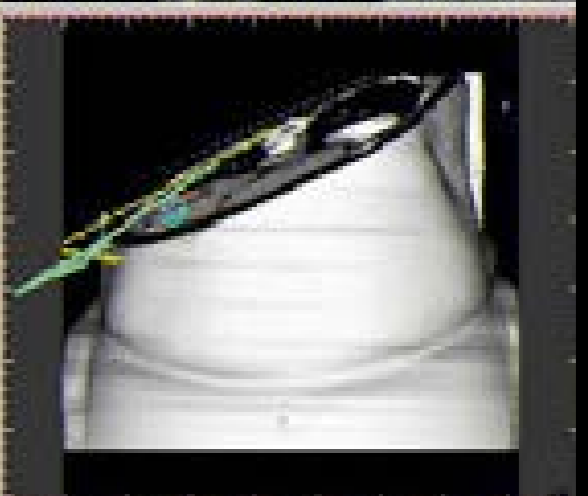
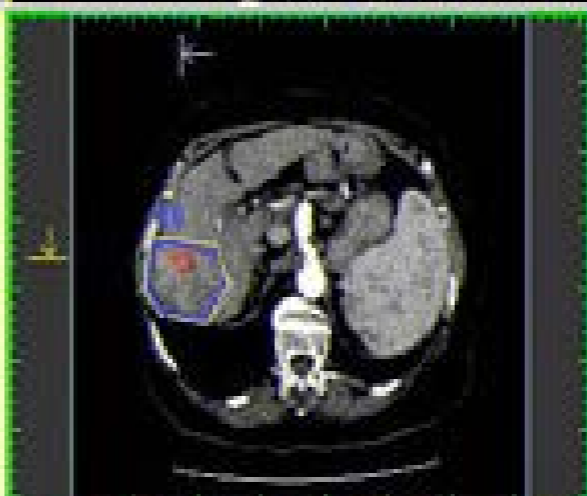
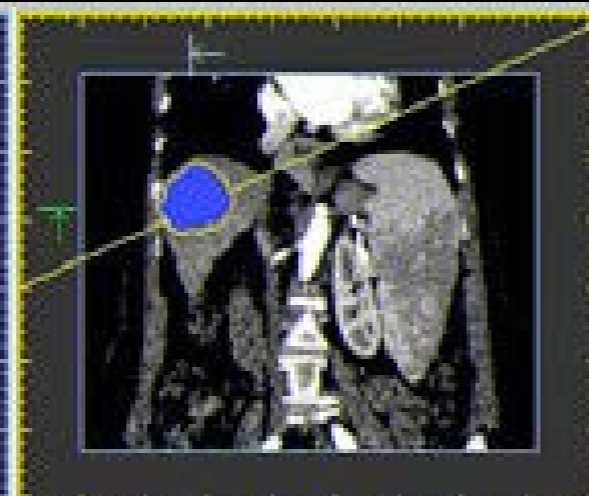
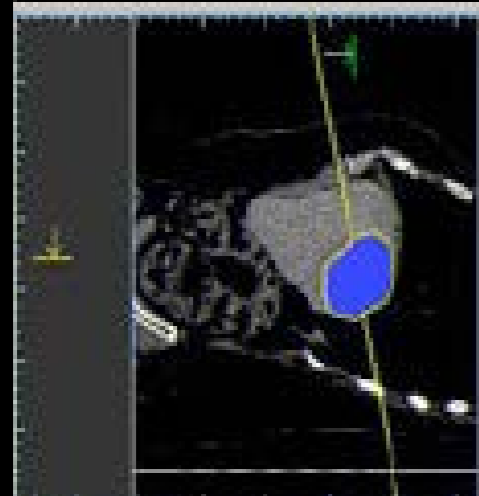


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MI 0.3

ES801E

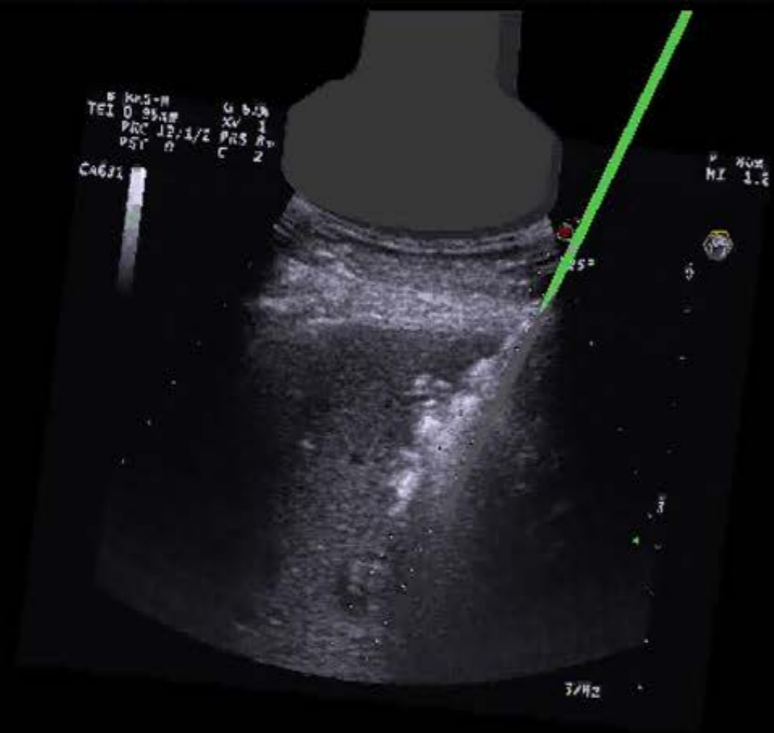


MEASURE  The ultrasound image has to be the reference.
Do not rely on virtual biopsy display alone during percutaneous procedures.



B RES-M G 61% P 80%
TEI 0 95mm XV 1 MI 1.2
PRC 12/1/2 PRS 8+
PST 0 C 2

CA631



@saote

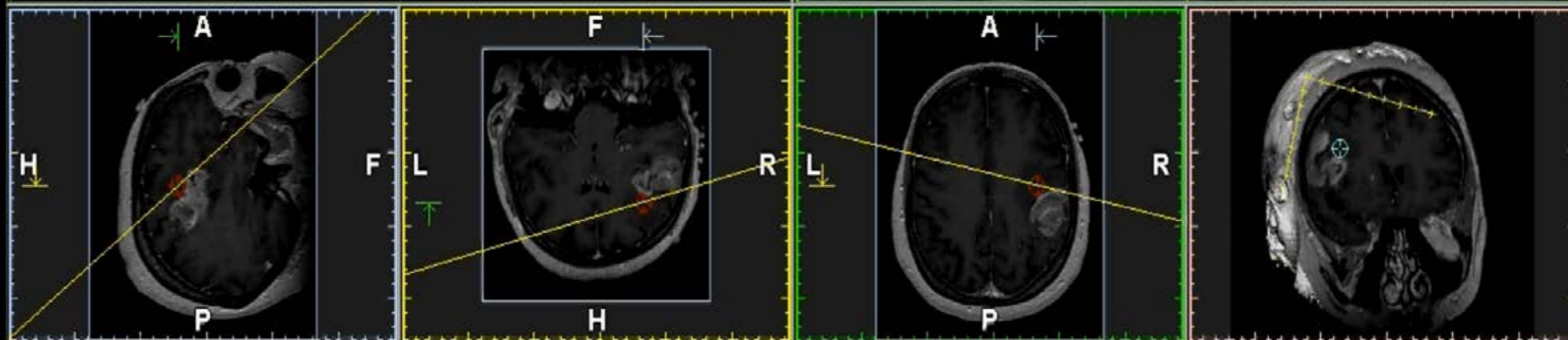
! The ultrasound image has to be the reference. Do not rely on virtual biopsy display alone during percutaneous procedures!

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B RES-L G 85%
Pa 152mm ZIASIAC3
PRG 13/7/2 PRS 3
PST 0 C 2
ID: 9900000000061536
LA435

P 100%
MI 0.7

roboter: 380000005
ID: 9900000000061536
Probe: LA435



RIS-8 C 576
P 75mm XV 1
PRC 11/1/2 PRS 8
PST 0 C 2

P 80K
HI 0.7

123



The following image has not been calibrated.
It may be an axial image, if the slice plane during acquisition is vertical.

