

Virtual Navigator

Urology



TRUS guided biopsy is recognised as the standard technique for randomised sampling and multiparametric prostate MRI demonstrated the best sensitivity and specificity among all imaging modalities

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Introduction

Virtual Navigator is Esaote's revolutionary technology for fusion imaging that allows CT, MR and PET side-by-side with real-time ultrasound.

Virtual Navigator has all the advantages of different modalities and provides a real-time, low-cost and radiation-free solution that aims to guide operators in diagnosis, everyday clinical practice, interventional procedures, research and teaching.

Increased Insonation Rates

Esaote Virtual Navigator gives operators the option of performing real-time fusion with multiple second modalities' imaging, adding real-time capabilities to ultrasound such as Doppler, CEUS and Elastasonography.

Virtual Navigator increases your diagnostic confidence in:

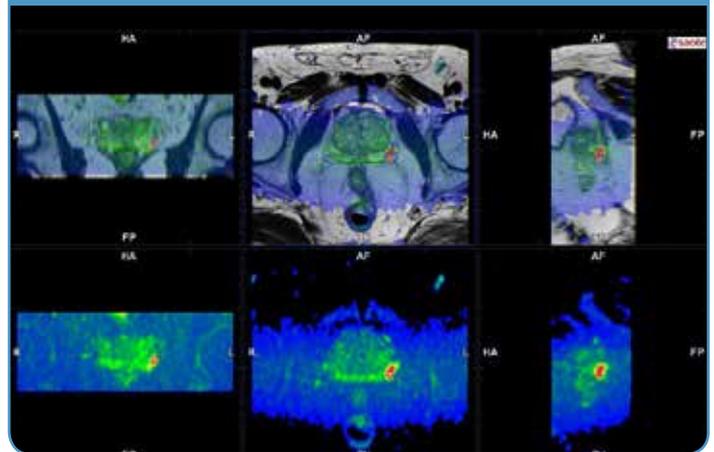
- Visualising different datasets with Real-time multimodality fusion imaging for diagnosis
- Planning and taking the best scanning and targeting approach
- Guiding the operator during interventional procedures

To test and validate fusion imaging in this area, Esaote Virtual Navigator system was employed to display ultrasound scans on a split screen next to matching virtual slices obtained with MRI and to fuse these images together in real-time thereby offering the reliability of ultrasound's high temporal resolution data (Colour/ Power Doppler and Elastasonography) with MRI's high spatial resolution data. This system is currently used for urology applications with promising results, especially in supporting and guiding biopsy operations and laser thermal ablations in both transperineal and transrectal approaches.

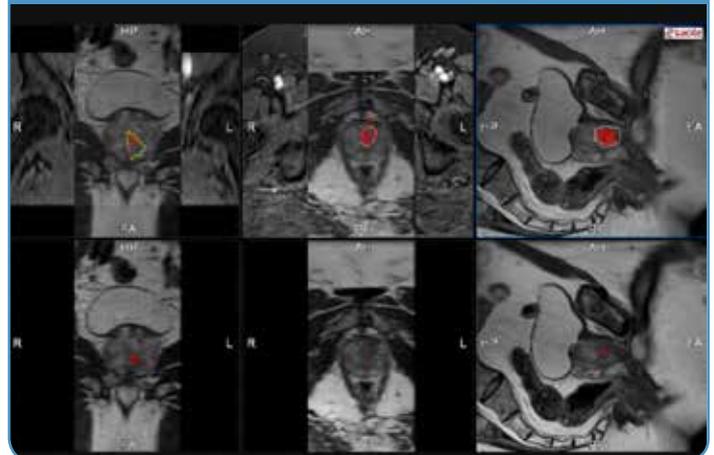
Real-Time Fusion Imaging: Clinical Solutions for Diagnosis and Intervention in Urology

Esaote Virtual Navigator can be used to guide countless interventional procedures by simulating the position of therapeutic tools with respect to the volumetric representation of body's structure obtained by a wide range of secondary imaging modalities such as MRI, CT, PET, 3D Imaging, Doppler, Elastasonography and Contrast Enhanced Ultrasound.

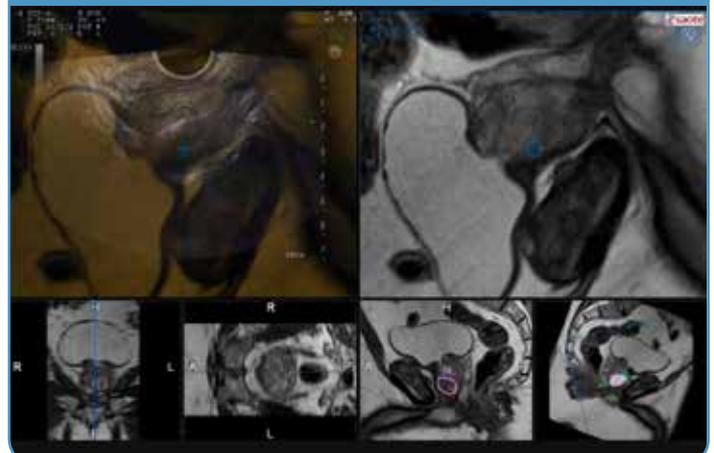
TRUS-MRI navigation analysing multiparametric MRI



TRUS-MRI navigation localising and defining the target

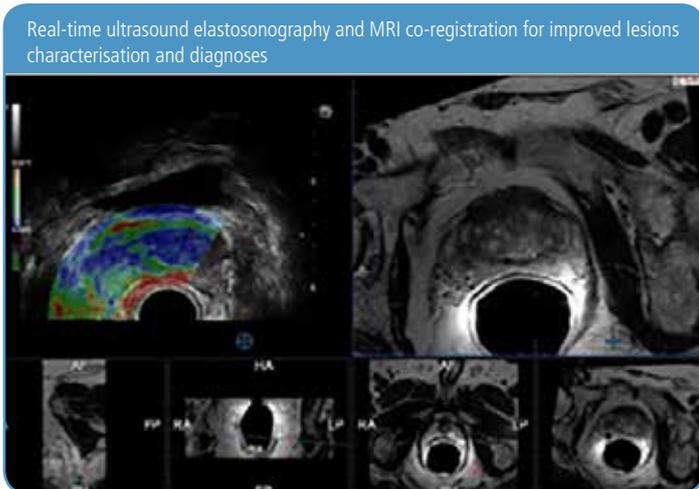
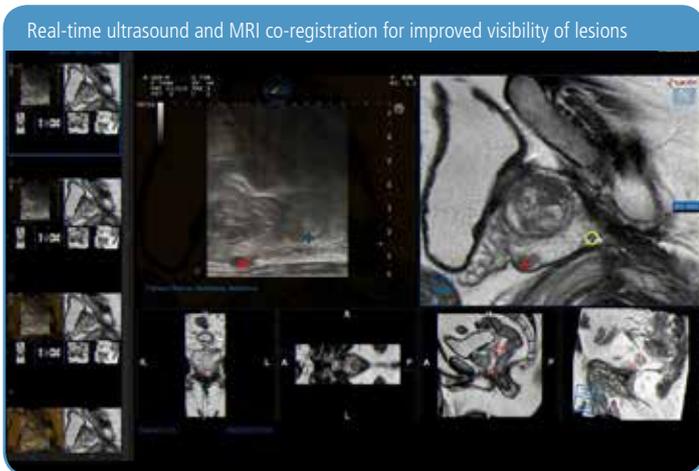


Real-time ultrasound and MRI co-registration for improved visibility of lesions



The system enables accurate co-registration of real-time TRUS and MRI. The mean time required for co-registration and target delineation is 4 minutes

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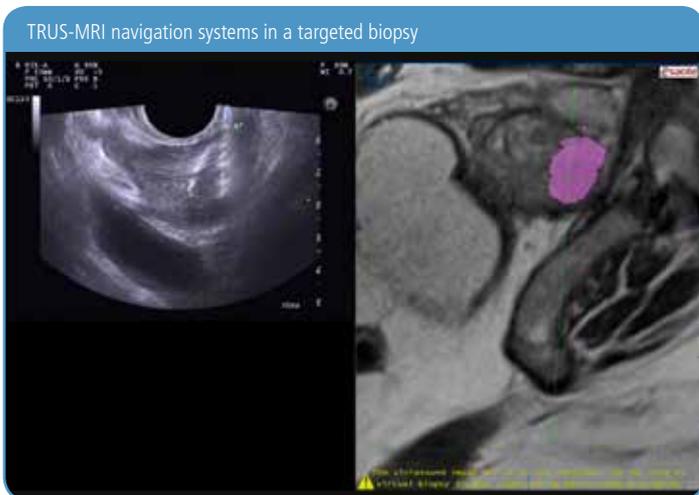


Here some highlights of ESAOTE Virtual Navigator using TRUS-MRI fusion:

- Reduction of FNR (25-35%) after randomised biopsy (10-12 samples)
- Reduction of 2° and 3° biopsies
- Better correspondence between actual situation and the Gleason score proven in the biopsy
- More reliable information for watchful waiting approach

Supporting Different Approaches and Clinical Needs with Real-time Fusion Imaging

Esaote Virtual Navigator offers infinite possibilities for patient monitoring, diagnosis and follow-up and is an excellent solution for Interventional Radiologists and Urologists in Prostate.



The possibility of more accurate pretreatment staging favours the use of the watchful approach programs. In this scenario ablation procedures will play an essential role again

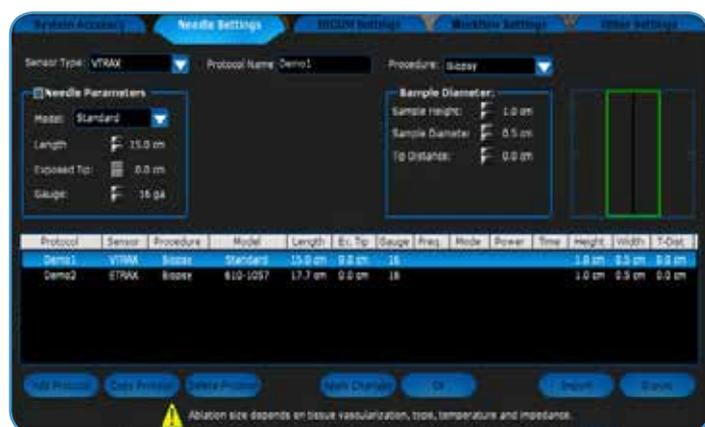
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Different operators perform virtually-guided fusion imaging biopsies with different approaches, such as transrectal or transperineal.

Virtual Navigator offers the possibility of performing biopsy procedures using both transrectal (thanks to a dedicated endocavity probe EC1123 and its fusion tracking device) and transperineal approaches, making use of the double transducer probe TRT33. Dedicated biopsy and ablation kits are available for each probe, with the possibility of tracking the biopsy needle on the 3D display or any other external device.

User-Defined Protocol for Biopsy and Ablation Procedures

A dedicated environment has been developed to assist users during cryotherapy, radiofrequency, microwaves and laser ablation procedures.



Virtual Navigator is dedicated to interventional and ablation procedures:

- Manual delineation of lesion margins
- Computed calculation of lesion volume
- Definition of expected necrotic ellipse
- Needle tracking capability for several brands of needle.

Clinical References

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