

Virtual Navigator

Urology

ultra





“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”

Prof. Giancarlo Bizzarri, Regina Apostolorum Hospital – Albano Laziale, Rome

Introduction

Virtual Navigator is the 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 Elastography.

Virtual Navigator increases your diagnostic confidence in:

- Visualizing 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 Urology, Esaote Virtual Navigator system has been 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 Elastography) with MRI’s high spatial resolution data (T2, DWI and Contrast).

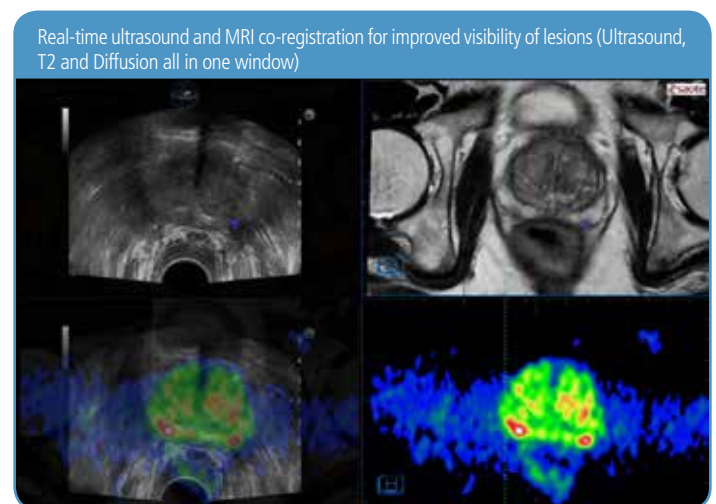
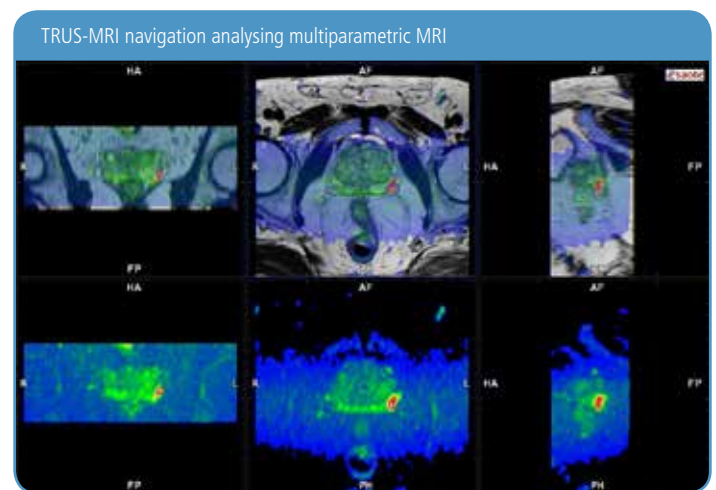
This system is currently used for urology applications with promising results, especially in supporting and guiding biopsy operations and laser thermal ablations in both transperineal and transrectal approaches.

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 (T2 and DWI at the same time) together with 3D Imaging, Doppler, Elastosonography and Contrast Enhanced Ultrasound.

Esaote Virtual Navigator using multi-modality Urology Fusion Imaging allows:

- Reduction of FNR (25-35%) after randomized 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



“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”

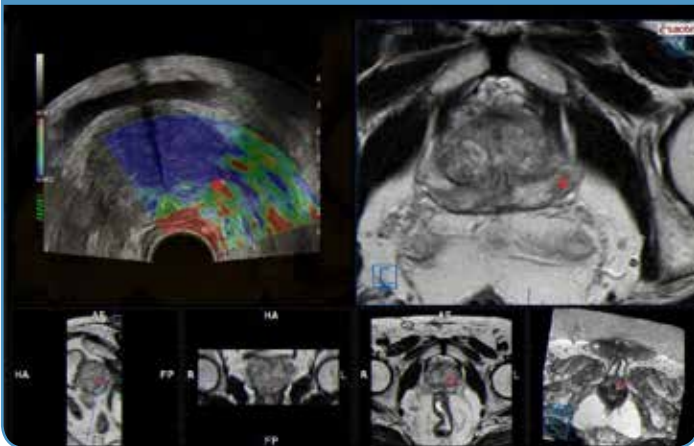
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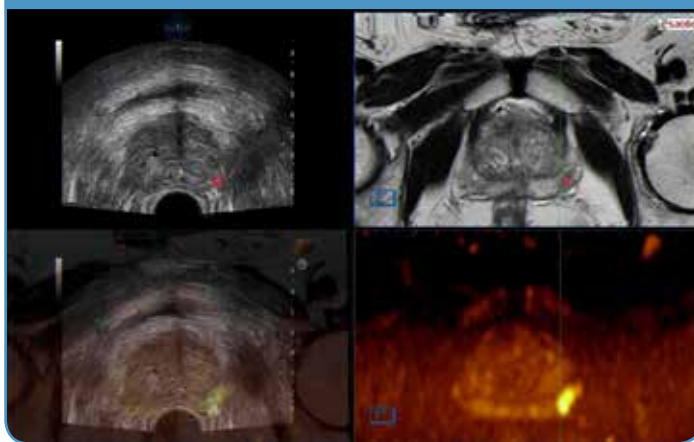
“TRUS-MRI fusion with Virtual Navigator enables to target the index lesion by needle biopsy for accurate diagnosis with a very fast approach”

MD. Adil Ouzzane (MD, PhD, FEBU), Department of Urology, Polyclinique Sainte-Marguerite, Auxerre (France) Inserm, U1189 Research Lab, Lille (Geance)

Real-time ultrasound elastosonography and MRI co-registration for improved lesions characterisation and diagnoses



Real-time needle guidance with ultrasound and multiparametric MRI (T2 and Diffusion)



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

Virtual Navigator is an accurate and fast way to perform targeted biopsy

Targeted biopsy with TRUS-MRI fusion is most likely to serve as a selection tool for focal therapy. Thus, mp-MRI of the prostate obtained prior to biopsy in patients with suspected prostate cancer has been shown to be accurate in both anterior and posterior zones of the gland. It has demonstrated high sensitivity ranging from 80 to 90% for index lesion identification. Comparatively to other techniques, Esaote’s Virtual Navigator uses a real-time approach in a fast manner.

Accurate estimation of tumor grade by TRUS-MRI fusion targeted biopsy

Estimation of tumor grade is also of utmost importance and result (concordance of 90%) of MRI-targeted core into the index lesion will be the foremost tool for pathology prediction, more than PSA and its derivate. This is particularly true for anterior cancers and for small lesions regardless of the location.

User-Defined Protocol for Biopsy and Ablation Procedures

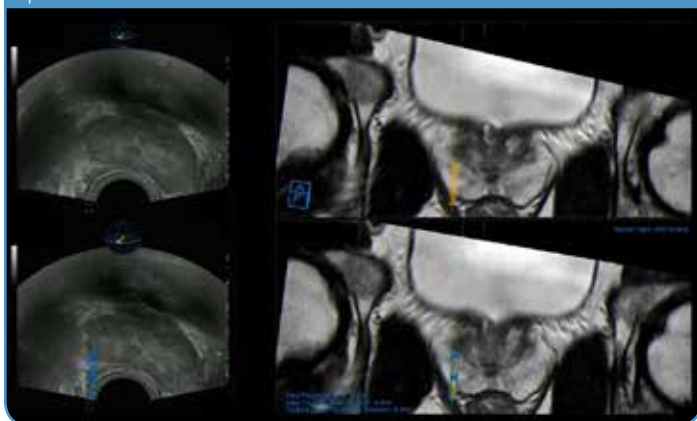
A dedicated environment has been developed to assist the operators during cryotherapy, radiofrequency, microwaves and laser ablation procedures with:

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

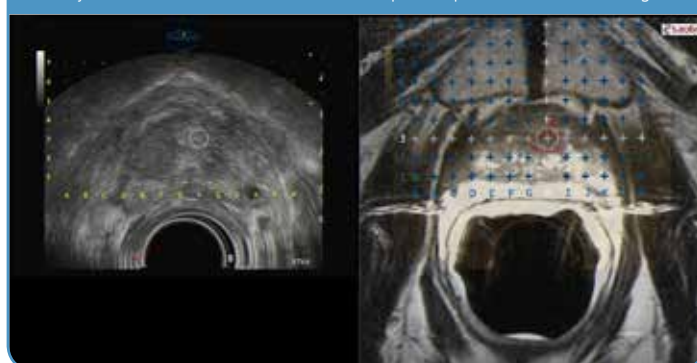
“The possibility of more accurate pretreatment staging favours the use of the watchful approach programs. In this scenario ablation procedures will play an essential role again”

Prof. Giancarlo Bizzarri, Regina Apostolorum Hospital – Albano Laziale, Rome

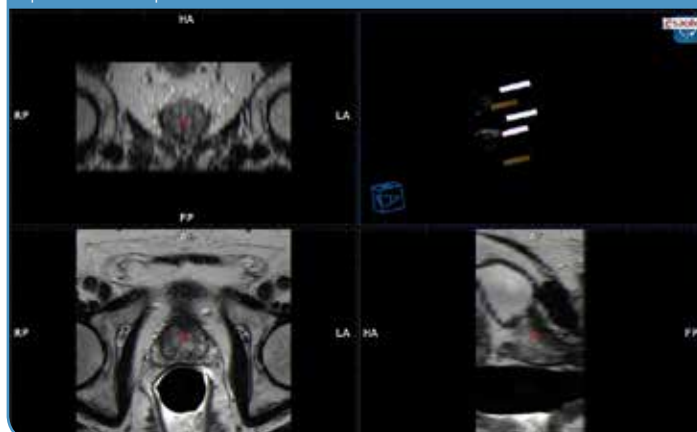
Real-time biopsy sample tracking capabilities with recording features within multi-parametric MRI and ultrasound



Grid layout with real-time ultrasound for advanced prostate procedures on Virtual Navigator



Representation of the biopsy samples within the 3D Volume of the prostate for patient followup



TRUS-MRI fusion with Virtual Navigator may enable to target the index lesion also in focal therapy procedures

Focal therapy (FT) may offer a promising treatment option in the field of low to intermediate risk localized prostate cancer. The aim of this concept is to combine minimal morbidity with cancer control as well as maintain the possibility of retreatment. Recent advances in multiparametric (mp) MRI and targeted biopsy has improved the diagnostic pathway of prostate cancer and increased the interest in FT.

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