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MRI of patient with adenocarcinoma in prostate

Case Study

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Patient history

This patient with PSA level of 4 ng/ml was referred to MRI by the urologist because a prostate mass was suspected after transrectal ultrasound. Gleason score was 4+3. The patient underwent his MRI examination in the radiology department of hospital Bianchi Melacrino Morelli of Reggio Calabria, Italy.

MR examination

The MRI examination was performed on Achieva 1.5T using the 32-channel SENSE Cardiac coil. This multi-parametric MRI exam was slightly adapted from the PI-RADS V2 guidelines for prostate MRI.

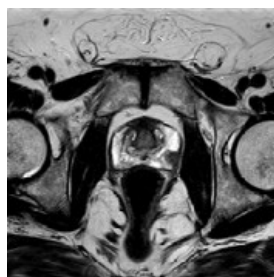
Case Study

[Achieva 1.5T](#)[ADC](#), [Body](#), [DWI](#), [eTHRIVE](#), [Oncology](#), [PI-RADS](#), [PI-RADS](#), [Prostate](#), [SENSE Cardiac coil](#), [THRIVE](#)

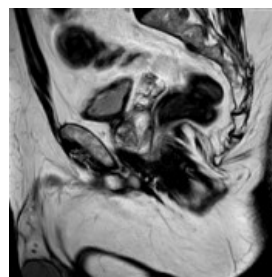
Images



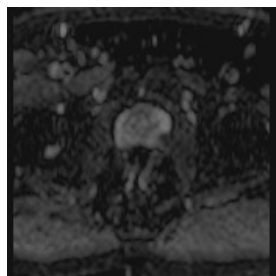
Coronal T2W TSE



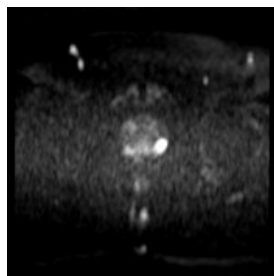
Paraxial T2W TSE



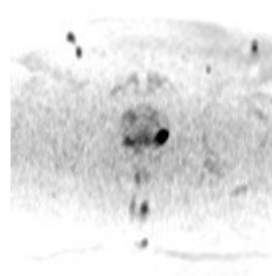
Sagittal T2W TSE



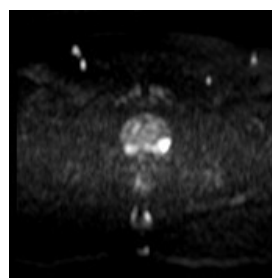
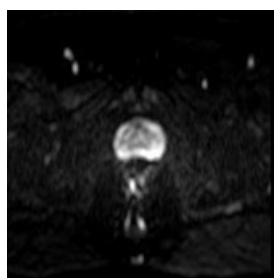
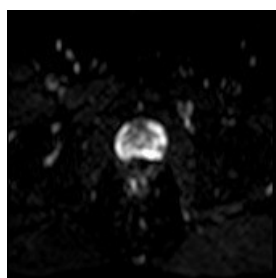
ADC

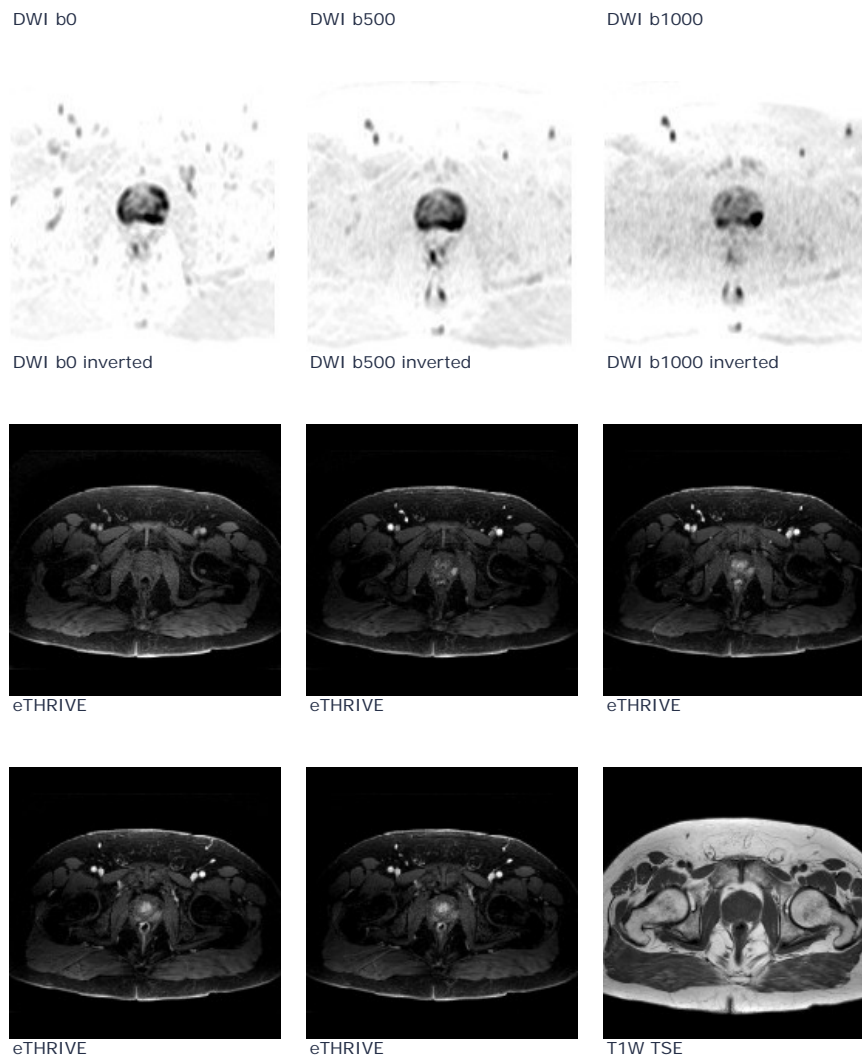


DWI b1400



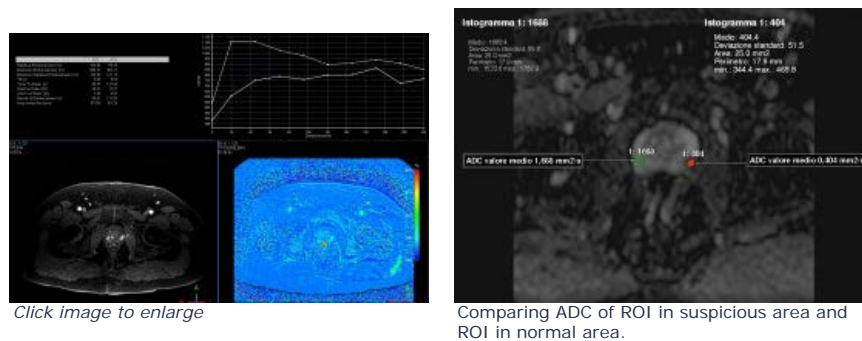
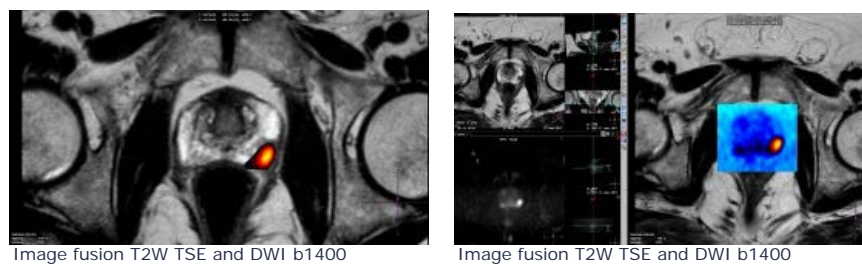
DWI b1400 inverted contrast





Postprocessing

Click on an image to enlarge



The quantitative evaluation of ADC was performed with a cut-off reference for distinguishing the

suspicious tissue from normal conditions This was done by placing ROIs (25 mm²) in both the suspected area and in a healthy tissue area.

An average ADC value of 0.404 mm²/s was determined in the ROI positioned in the suspected area on the ADC map. This value seems consistent with the Gleason score of 4+3 that was determined for this patient.

Diagnosis

By the use of this protocol and additional clinical and diagnostic findings, the patient was finally diagnosed with adenocarcinoma in the left lobe of the prostate.

Clinical impact

In this case study, using Achieva 1.5T with 32-channel SENSE Cardiac coil and a protocol set up closely similar to PI-RADS V2 provides excellent imaging of the prostate.

More information

Prostate imaging and reporting and data system (PI-RADS) version 1 was introduced by the European Society of Urogenital Radiology (ESUR) as a standardized scoring system to grade lesions on prostate MRI in 2012. In 2015, the updated PI-RADS Version 2 was introduced in a collaboration between the American College of Radiology (ACR), AdMeTech Foundation and ESUR.

Prostate MRI acquisition protocols should be tailored to the specific patient, clinical questions, management options and MRI equipment, but according to this guideline it should at least include:

- T2W – ideally 3 planes
- DWI – to a maximum b-value of 1400 sec/mm² or greater
- ADC
- Dynamic series

High b-value DWI series are important in peripheral zone assessment. T2W series are important in transition zone analysis. The findings are subsequently labeled as PIRADS 1 to 5 for focal abnormalities.

Results from case studies are not predictive of other cases. Results in other cases may vary.

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