

# Case Reports: MRI-guided Prostate Biopsies

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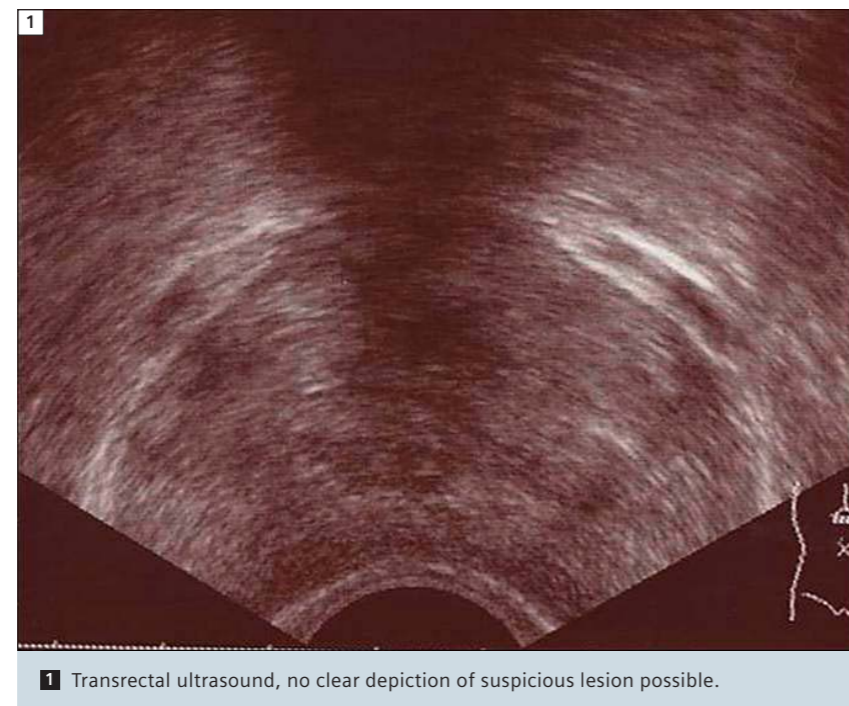
This article examines two important clinical cases for a better understanding of potential benefits, but also limitations, of MRI-guided prostate biopsies. All examinations were performed on a 1.5T system (MAGNETOM Symphony, Siemens Healthcare, Erlangen, Germany). Prior to the MRI-guided biopsy, an MRI examination with a combined endorectal body phased-array coil was performed. After insertion of the endorectal coil, the imaging protocol for localization of suspicious areas within the gland consisted of the following T2-weighted TSE sequences: Axial (TR 4.000 ms; TE 102 ms; slice thickness (ST) 3 mm; slice distance (GAP) 0.25; field of view (FOV) 160 mm; matrix 256 × 256);

Coronal (TR 4.000 ms; TE 102 ms; ST 3 mm; GAP 0.25; FOV 200 mm; matrix 256 × 256); Sagittal (TR 4.560 ms; TE 106 ms; ST 3 mm; GAP 0.25; FOV 200 mm; matrix 230 × 256); Subsequently, a T1-weighted axial TSE sequence was applied (TR 700 ms; TE 12 ms; ST 4 mm; GAP 0.3; FOV 160 mm; matrix 192 × 256) from the prostate apex up to the seminal vesicle. In addition, a T1-weighted axial TSE sequence (TR 500 ms; TE 13 ms; ST 5 mm; GAP 0.3; FOV 300 mm; matrix 256 × 256) was applied through the regional lymph drain path from the prostate base up to the aorta bifurcation.

After localization of the tumor-suspicious areas, the endorectal coil was removed and the MR visible needle guide was inserted into the patient's rectum and guided to the area to be punctured close by the prostate capsule. The biopsies were performed by means of an MR-compatible biopsy gun (16 G; MRI Devices, Schwerin, Germany). Further information about the procedure can be found in: Engelhard K, Hollenbach HP, Kiefer B, Winkel A, Goeb K, Engehausen D. "Prostate biopsy in the supine position in a standard 1.5T scanner under real time MR-imaging control using a MR-compatible endorectal biopsy device." Eur Radiol. 2006 Jun;16(6):1237-43. Epub 2006 Feb 1.

## Case 1

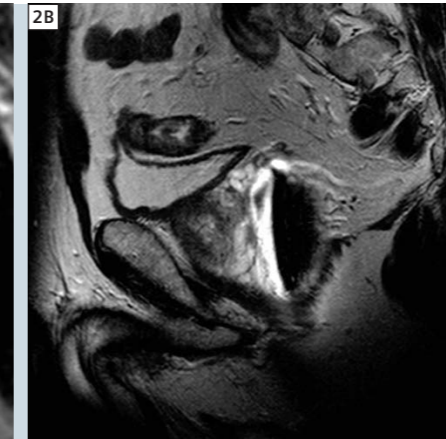
A 60-year-old patient with a PSA elevated to 10 ng/ml is shown. Transrectal ultrasound (TRUS) did not show a cancer-suspected lesion (Fig. 1), however, the endorectal MRT showed a small but cancer-suspected hypointense lesion in medio-lateral orientation in the middle peripheral gland, left (Fig. 2). MRI-guided punch biopsy was performed at the suspected site (Fig. 3), histology revealed an Adeno-Carcinoma (G1, Gleason 2 + 2 = 4). The patient was then referred to radical prostatectomy. Based prostatectomy specimen, pT3a G3 pN0 pM0, Gleason 3 + 4 = 7 was diagnosed with tumor cell layers in both lobes. Therefore it is important to stress that when the location of the biopsy site is determined solely by suspicious areas in the T2-weighted pulse sequence, not all tumor sites become visible.



1 Transrectal ultrasound, no clear depiction of suspicious lesion possible.



2A Transversal T2w TSE MR demonstrating a small suspicious lesion within the left lateral zone.



2B Corresponding sagittal T2w slice.



3 MR image in oblique orientation during biopsy.

## Case 2

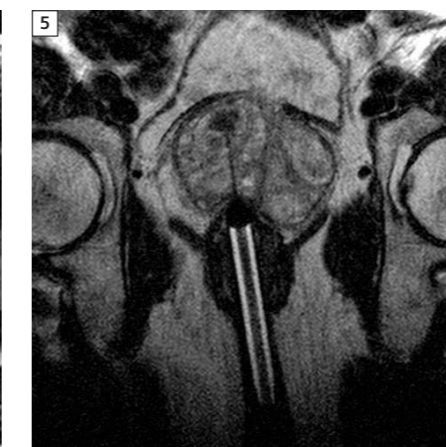
In the T2-weighted image, low-signal lesions within inhomogeneous adenoma structures could correspond to hypercellular carcinomas. As a differential diagnosis, sclerotic adenoma nodes rich in connective tissue also produce low signal. In this case, a 70-year-old patient with a PSA elevated to 12 ng/ml is

shown. Before MRI-guided prostate biopsy, the patient has undergone three negative punch biopsies for evaluation of a TRUS-proven tumor (once with 6 samples, twice with 18 samples). The presence of a suspicious lesion was confirmed by T2w MRI and therefore the patient was referred to MRI-guided punch

biopsy of the suspicious hypointense area in the ventral transition zone within adenoma structures (Figs. 4 and 5). Histology revealed sclerotic node formation with collagen-rich benign prostatic hyperplasia (BPH).



4 Transversal T2w TSE demonstrating irregular and unclear nodule in the ventral right central gland.



5 Corresponding MR image in oblique orientation taken during biopsy.

### Contact

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