

Transrectal MRI-guided biopsy of the prostate - Results in a cohort with 100 patients with negative ultrasound guided biopsy and persisting or increasing PSA levels

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INTRODUCTION

The MRI guided prostate biopsy (MRI-Bx) could already prove to be clinically feasible in patients with the combination of a prior negative ultrasound guided biopsy (TRUS-Bx), persisting or increasing PSA levels and suspicious findings in a state-of-the-art diagnostic MRI examination [1,2]. Purpose of this work is to report the experiences with the MRI-Bx after 5 years and 100 patients in the clinical routine.

MATERIALS & METHODS

From 8/2004 to 11/2009 100 patients with persisting / increasing PSA levels (≥ 4 ng/ml) and at least one negative TRUS-Bx were referred to our institution for MRI-Bx. All patients had reported suspicious findings on T2w pre-diagnostic MRI. Pre-biopsy diagnostic MRI (endoMRI) was performed in all cases with an endorectal coil (Medrad, Germany). 39 patients were included after multimodal imaging with T1w dynamic contrast enhanced (DCE) imaging, MR spectroscopic imaging and diffusion weighted imaging which has proven to be of great value for tumor localization and planning of MR-guided interventions [3,4]. Indication for MRI-Bx was based on localization and size of the reported endoMRI findings. All MRI-Bx were performed with a conventional or open bore 1.5 Tesla MR scanner (Magnetom Avanto, Magnetom Espree, Siemens Erlangen, Germany). Images were acquired with combined body-phased coils. An MRI-compatible 18-gauge fully automatic biopsy device was used (Invivo Germany GmbH, Schwerin, Germany). Antibiosis was applied according clinical standards for prostate biopsies before and after intervention; no sedatives or anesthetics were applied routinely. All MRI-Bx were performed in cooperation with the department of urology. Documentation and follow-up of the patients were according clinical routine procedures standards, including a digital rectal examination and urinary analysis.

RESULTS

At MRI-Bx, mean age of the patients was 64.8 years (median 66 years); last documented PSA level before MRI-Bx had an average of 11.3 (median 8.8,) ng/ml; the mean prostate volume was 47.5 ccm (range 13 to 183 ccm; median 41.5 ccm). All patients tolerated the MRI-Bx well. Most documented discomfort was shoulder pain. One patient developed a larger intraprostatic haematoma. In two patients, antibiotic scheme had to be changed after intervention because of an infection. No injuries of the urethra or bladder were observed. In total, 414 specimens were taken (median 4/patient). In 49/100 patients, prostate cancer was diagnosed (detection rate 49%). Median Gleason score was 6 (6-9). In patients with negative biopsy results 44% adenomyomatosis, 28% prostatitis and 12% atypical cells / PIN was reported.

CONCLUSION

MRI-guided biopsy of the prostate in individuals with elevated or increasing PSA-levels after negative TRUS-biopsy is a save procedure that has been established in clinical routine. Based on our results in this larger patient cohort detection rate (49%) of MRI-Bx is considerably higher than detection rate of standard repetition procedure with TRUS-Bx (up to 26% after saturation biopsy [5]).

FIGURES



A) 71-year-old patient with an PSA elevation after negative biopsy a year ago. T2w pre-biopsy diagnostic sequence shows hypointense area in the right peripheral zone. MR-guided biopsy of the suspicious area: B) T2w planning sequence; arrow shows suspect area described before. C) placement of the biopsy needle in front of the suspicious area (arrow). Histopathology reported prostate cancer with a Gleason Score of 7(3+4).

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