

Polish study on MRI-ultrasound for targeted prostate biopsy wins CEM award

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Using Magnetic Resonance Imaging-Ultrasound (MRIUS)- guided prostate biopsy has high sensitivity to detect prostate abnormalities compared with transrectal ultrasonography (TRUS biopsy) of MRI positive findings.

The study won the first prize from Karl Storz for best poster at the EAU 13th Central European Meeting (CEM) held from October 4 to 6, 2013 in Prague, Czech Republic.

"The systematic 12-core transrectal ultrasound guided biopsy (TRUS biopsy) which is currently considered the standard of care for the diagnosis of [prostate](#) cancer (PCa), misses many small, non-palpable and ultrasound invisible lesions," said presenting author Anna Katarzyna Czech of the Dept. of Urology, Jagiellonian University in Krakow, Poland.

Although the new imaging modalities, including MRI, have improved the rate of tissue abnormality detection, Czech said these procedures are time consuming and uncomfortable for a patient which limits their use. "However, by fusing MRI with TRUS images it became possible for the urologist to perform the MRI guided TRUS biopsies in the office setting," she added.

In their study, Czech and colleagues used the real-time fusion of TRUS images with previously recorded MR images (MRIUS), based on linear interpolation of pixels. Eighty men, who had prostate lesions detected

exclusively in the transrectal prostate magnetic resonance imaging, were included in the study. All men were randomised into two groups (40 patients each) and underwent TRUS guided biopsy.

In group I, TRUS biopsies of MRI identified lesions were performed, while in group II: biopsies of the lesions visualised in MRI were performed using MRIUS method which allowed for the real-time fusion of TRUS images with previously recorded MR images.

Histopathological examination of TRUS guided [prostate biopsy](#) of MRI identified lesions was positive for prostate cancer in 8 cases, for ASAP and HGPIN in 3 and for chronic prostatitis in 5. No microscopic pathologies were identified in 24 patients. In group II, there were 17 cases of prostate cancer, 8 of ASAP and HGPIN, and 8 of chronic prostatitis found. In 8 out of 40 men, histopathological examination identified no abnormalities.

In their results, the researchers said MRIUS guided prostate biopsy yielded 22.5%, 10% and 7.5% more prostate cancer, ASAP and HGPIN and chronic prostatitis cases, respectively compared with TRUS biopsies of the MRI identified lesions.

The sensitivity to identify microscopically confirmed prostate abnormalities was 40% (95% CI: 24.9-56.7) with TRUS guided prostate biopsy of MRI identified lesions and 80% (95% CI: 64.4-90.9) with MRIUS method. This difference was statistically significant ($p=0.001$).

"Fusion technology guided biopsy yielded 42.5% more prostate abnormalities than the TRUS biopsy of MRI positive lesions. Moreover, MRIUS targeted biopsies were sufficient in all PCa cases to determine their clinical significance, making the fusion technology a potential solution for the patients with clinical suspicion of [prostate cancer](#)," explained Czech.

She added that further research will determine the relevance of an endorectal coil used during MRI for prostate deformation, and gland volume measurements, as well as the feasibility of MRIUS in order to detect PCa in larger prostates.

She also noted that the use of 3Tesla MRI for fusion technology, which would eliminate use of endorectal coil, needs to be investigated. Despite these limitations the authors pointed out that MRIUS guided prostate biopsy has high sensitivity to detect prostate abnormalities.

"It markedly improved ability to detect clinically significant [lesions](#) compared with TRUS biopsy of MRI positive findings," they said.

More information: Golabek T., Lipczynski W., Czech A. et al., "Value of MRI-ultrasound fusion for guidance of targeted prostate biopsy," First Prize, Best Poster, EAU 13th Central European Meeting (CEM), 4 to 6 October 2013; Prague, Czech Republic; Abstract Nr: C89.

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