Diagnosis of anterior prostate cancer using MRI/TRUS real time soft image fusion

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BACKGROUND
Anterior prostate cancers (APC) are rarely palpable and difficult to sample when using traditional transrectal ultrasound (TRUS) biopsies. Accurate targeted biopsies can be performed when using magnetic resonance imaging (MRI) and 3D TRUS real time soft image fusion. The aim of the study was to evaluate the accuracy of MRI/TRUS guided biopsies in the detection of APC.

METHOD
Between 2010 and 2012, 358 patients with elevated prostate specific antigen (PSA) underwent MRI/TRUS guided biopsies. 90/358 (25%) pts with MRI suspicious anterior cancer were included in the study. Biopsy patients groups were: initial biopsy 5 pts, 1st-10th re-biopsy 63 pts (mean previous negative biopsy procedures 2,6), re-biopsy due to active surveillance 19 pts, and PSA recurrence after radiotherapy 3 pts.

MRI: 1.5T Avanto (Siemens, Erlangen) and body array coil. Sequences: ax3D T2w, and DWI b2000 and b50/1000 were used for apparent diffusion coefficient (ADC).

Ultrasound: 3D Accuvix V10 (Medison®, Korea), navigation system: Urostation (Koelis®, Grenoble, France).

Minimum one biopsy was obtained from each MRI target using 18G Tru Core ®II (Angiothech, USA). One sample T-test was used for statistics.

RESULTS
74/90 (82%) pts had positive targeted biopsies with Gleason score 6 (n=25), 7 (n=34), 8 (n=14) and 9 (n=1). Mean tumour volume was 3,2 ml (95%CI 1,6-4,8). ADC values for positive targeted biopsies were 78 x10⁻⁵mm²/s (95% CI 74-82) and for negative targeted biopsies 97 x10⁻⁵mm²/s (95% CI 90-104), p<0.001.

The mean number of positive targeted biopsies pr. patient was 2.7, and the mean length of cancer pr. biopsy was 5.5 mm.

CONCLUSION
Biopsies using MRI/TRUS soft image fusion technique is an accurate method for diagnosing anterior prostate cancer.