

## First experience of using multi-parametric MRI/US fusion system for prostate biopsy to diagnose clinically significant prostate cancer at the National Cancer Institute of Lithuania

European Urology Supplements 2019;18(3):e2445

Matulevičius A.<sup>1</sup>, Ulys A.<sup>2</sup>, Vėželis A.<sup>2</sup>, Trakymas M.<sup>2</sup>, Jankevičius F.<sup>2</sup>

<sup>1</sup>National Cancer Institute of Lithuania, Dept. of Oncourology and Vilnius University, Life Sciences Center, Vilnius, Lithuania, <sup>2</sup>National Cancer Institute of Lithuania, Dept. of Oncourology, Vilnius, Lithuania

**Introduction & Objectives:** Men with elevated PSA usually undergo transrectal ultrasound guided prostate biopsy (TRUS-biopsy), but this technique sometimes detects clinically insignificant prostate cancer (PCa) and misses clinically significant ones. Also TRUS-biopsy cause side-effects including bleeding, pain, and systematic infection. Multi-parametric magnetic resonance imaging (MP-MRI) and US fusion system for prostate biopsy might allow to avoid unnecessary TRUS-biopsy and improve diagnostic accuracy for clinically significant PCa. The main aim of this study was to determine the accuracy of mpMRI/US fusion prostate biopsy for clinically significant PCa detection at the NCI in Lithuania.

**Materials & Methods:** 28 men underwent multiparametric MRI and MRI/US fusion-guided prostate biopsy between July 2018 and March 2019. MRI/US fusion-guided biopsy was performed with the BioJet-fusion system and software (D&K Technologies, Barum, Germany). Target biopsy and 12x systematic biopsy were performed for all of them. All patients were biopsied with a transperineal approach under general anesthesia in the dorsal lithotomy position under antibiotic prophylaxis. All patients had suspicious lesion which was negative during a previous transrectal systematic biopsy. Statistical analyses were performed using Student's t-test with significance level of  $p \leq 0.05$ .

**Results:** During the period, MRI/US fusion-guided prostate biopsy was performed for 28 patients. The mean patients' age was  $64 \pm 8.27$  years. 20 patients (71.4%) were diagnosed with PCa either by target biopsy or systematic biopsy. Cancer detection rate of target biopsy was 60.7%, meanwhile 35.7 % of the cases were diagnosed with PCa by random prostate biopsy. However, no clinically significant cancer was identified by systematic biopsy. The clinically significant PCa (csPCa) was detected in biopsies from 10 patients (35.7%), and all samples were obtained from targeted biopsy. Using the transperineal approach, the mean number of biopsy cores per patient was  $17.57 \pm 3.14$ , while  $4.26 \pm 1.35$  cores were obtained from targeted biopsy and  $10.78 \pm 3.43$  cores from additional random biopsy. PSA levels were significantly higher in patients with csPCa compared to patients without csPCa ( $11.63 \pm 8.25$  vs  $7.33 \pm 4.9$  ng/ml,  $p = 0.0467$ ). Prostate volume was significantly lower in the group with csPCa ( $48.78 \pm 13.13$  vs patients without csPCa  $63.77 \pm 23.35$  ml,  $p = 0.0368$ ). No significant difference was found in lesion size ( $2.4 \pm 2.2$  vs  $1.7 \pm 1.5$  ml) or in PI-RADS scores ( $4.5 \pm 0.52$  vs  $4.2 \pm 0.57$ ).

**Conclusions:** High detection rate of PCa could be reached by mpMRI in combination with MRI/US fusion-guided biopsy. The BioJet system provides good opportunity to perform biopsy in transperineal approach. In addition, the transperineal approach gives the option for fusion-guided focal therapy strategies.