9   Shear wave elastography and multiparametric MRI in prostate cancer diagnosis

Shimanets S.[1] , Karman A.[1] , Mihalkevich E.V.[2] , Mokhort A.[3] , Minich A.[3] , Krasny S.[3]

[1]N.N. Alexandrov National Cancer Centre of Belarus, Diagnostic Radiology Group, Minsk, Belarus, [2]N.N. Alexandrov National Cancer Centre of Belarus, Dept. of Medical Oncology, Minsk, Belarus, [3]N.N. Alexandrov National Cancer Centre of Belarus, Dept. of Urology, Minsk, Belarus

Introduction & Objectives: Up to 37% of clinically significant prostate cancer (csPCa) are not detected at multiparametric MRI (mpMRI). Shear wave elastography (SWE) is a promising imaging modality which may improve prostate cancer diagnosis. The aim of the study was to evaluate shear wave elastography and multiparametric MRI in the detection of prostate cancer.

Materials & Methods: 78 patients with suspected PCa with median PSA level of 12.1 ng/mL were included in the study. Patients underwent first multiparametric MRI and then TRUS with SWE before the biopsy. Then systematic 24-core and cognitive fusion targeted biopsy was performed from abnormal lesions detected by mpMRI or SWE. Clinically significant prostate cancer was defined as at least one biopsy core with a Gleason score of 3+4.

Results: Prostate cancer was confirmed in 41/78 (52.6%) of patients, while clinically significant cancer was found in 16/41 (41.5%).
Targeted biopsy from the abnormal mpMRI lesion revealed PCa in 22/48 (45.8%) of patients with Gleason score ≥7in 11/22 of them (50.0%). Average stiffness of the suspicious mpMRI lesion with biopsy-proven PCa was 86.8±47.3 kPa. Biopsy of the suspicious SWE lesions (≥35 kPa, ratio≥ 2), revealed prostate cancer in 21/46 patients with Gleason score ≥7 in 10/21 of them (47.6%). Average stiffness of the suspicious TRUS lesions with biopsy-proven PCa was 93.3±39.9 kPa. In 4/41 (9.8%) patients, prostate cancer was detected by SWE only and was missed by mpMRI. Sensitivity, specificity and diagnostic accuracy of SWE were 82.1%, 27.3% and 48.6%, respectively.

Conclusions: Using SWE before biopsy could improve prostate cancer detection in the lesions undetectable by mpMRI.