

Park K.J., Kim M-H., Kim J.K.

Asan Medical Center, Dept. of Radiology, Seoul, South Korea

**Introduction & Objectives:** Recently, Mehralivand et al. introduced a three-tier grading system based on MR to evaluate pathologic extraprostatic extension (EPE). However, it needs validation for general use among different institutions and settings, because this study was performed in a single institution and by a single reader. Moreover, the rationale of a specific cutoff of curvilinear contact length (CCL) was not provided in their study. The purpose of this study was to validate a new grading system for the assessment of risk of EPE based on MRI and to compare with ESUR score for the assessment of risk of extracapsular extension in patients with prostate cancer

**Materials & Methods:** Consecutive 441 male patients underwent preoperative MRI followed by radical prostatectomy from January to December 2016. A reader who blinded to pathologic results of EPE retrospectively measured CCL and assessed the EPE grade as follows: Grade 1, CCL of 1.5 cm or capsular bulge and irregularity; grade 2, both features; and grade 3; frank capsular breach. A 4-point ESUR score for the EPE was also evaluated as follows: 1, abutment; 3, irregularity; 4, bulge or neurovascular bundle asymmetry; and 5, measurable EPE. The area under the Receiver-operating-characteristic curve (AUC) was used to compare the diagnostic performance between the EPE grade and the ESUR score.

**Results:** The mean age of patients was 64.9 (standard deviation, 6.7) and the mean prostate-specific antigen was 7.6 ng/mL. A total of 185 patients (42.0%) showed pathologic EPE at radical prostatectomy. The AUCs for assessment of pathologic EPE were 0.78 (95% CI: 0.74, 0.82) for EPE grade and 0.82 (95% CI: 0.78, 0.86) for ESUR score. Addition of CCL to ESUR score showed a significant added value (AUC, 0.88; 95% CI: 0.84, 0.91;  $P < 0.001$ ).

**Conclusions:** ESUR score showed higher diagnostic performance than newly proposed EPE grade. Quantitative analysis for CCL showed incremental value to qualitative analysis of ESUR score to predict pathologic EPE.