PE06 Predictive value of PI-RADS score for pT3 prostate cancer in robot-assisted radical prostatectomy

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Introduction & Objectives: Although extraprostatic extension is one of the postoperative prognostic factors for localized prostate cancer, it is difficult to predict whether organ-confined disease or not before surgery. We evaluate the role of the Prostate Imaging–Reporting and Data System (PI-RADS) in the prediction of pT3 preoperatively.

Materials & Methods: A total of 319 patients were treated for localized prostate cancer between 2014 and 2017 at our hospital. The present study included 46 patients who were studied multi-parametric magnetic resonance imaging (mpMRI) before robot-assisted radical prostatectomy (RARP). The median patient age was 68 years old (52 – 76) and the median prostate specific antigen (PSA) was 7.98 ng/ml (4.31 – 110.0 ng/ml). Single diagnostic radiologist evaluated preoperative mpMRI and scored using PI-RADS version 2 system. After RARP, 24 patients were diagnosed as organ confined disease, pT2a, pT2b or pT3a, and 21 were diagnosed as extraprostatic disease, pT3a. We evaluated the prognostic value of preoperative characteristics including PI-RADS score for extracapsular invasion of prostate cancer. The chi-square test was used to evaluate the association between extracapsular invasion and preoperative characteristics.

Results: The mpMRI was scored PI-RADS 1, 2, 3, 4, and 5 in 4.4%, 2.2%, 6.6%, 60.0%, and 26.7%, respectively. Extraprostatic extension(EPE) was significantly higher in patients with PI-RADS 5 (75%) than patients with PI-RADS 1-4 (36.4%) ($p = 0.022$). Beyond this point, our analysis was limited to the patients with PI-RADS 4 or less. Patients with PI-RADS 4 did not have a higher rate of pT3 than patients with PI-RADS 1-3 ($p = 0.268$). pT3 lesion was more frequently observed in the patients with biopsy Gleason score 4+3 or more than patients with biopsy Gleason score 3+4 or less ($P = 0.047$). Patients with PSA density higher than 0.2 ng/ml/cm^3 had significantly higher rate of pT3 than patients with PSA density 0.2 ng/ml/cm^3 or less ($p = 0.011$). Biopsy positive core rate was not statistically correlated with pT stage (0.077). To predict EPE, the patients with PI-RADS 5 or with PI-RADS 1-4 and PSA density > 0.2 ng/ml/cm^3 were defined as a high-risk group and the remaining were defined as a low-risk group. The sensitivity and specificity of the classification were 95.2% and 45.8%, respectively. The positive predictive value and the negative predictive value were 60.6% and 91.7%, respectively.

Conclusions: The prediction for extraprostatic extension using our classification had high sensitivity and negative predictive value. Our study population was relatively small and further evaluation is required for the accurate prediction for extraprostatic extension.