

EXTRA-TRANSITIONAL ZONE PROSTATE SPECIFIC ANTIGEN DENSITY (ETZD), A NOVEL STRUCTURE-BASED PARAMETER FOR QUANTIFYING THE ONCOLOGICAL HAZARD OF PROSTATES WITH STROMAL ENLARGEMENT; FROM THE PRESENCE OF MALIGNANCY TO UNFAVORABLE MALIGNANT PATHOLOGIC FEATURES

Hypothesis / aims of study

Elevation of serum prostatic specific antigen (PSA) levels due to benign stromal hyperplasia hinders the performance of PSA for evaluating the oncological hazard of large prostate. To stratify the PSA deviation due to stromal hyperplasia-induced structural changes, we propose a novel universal parameter, extra-translational zone density (ETzD) and the performance was analyzed

Study design, materials and methods

ETzD was developed as a concept to quantify hypothetical PSA density (PSAD) after enucleation of the transitional zone, by analyzing the actual post-enucleation PSA changes for 254 patients by Holmium laser. ETzD was formulated as the estimation of PSA density after hypothetical enucleation of the prostate and developed based on non-linear regression model with intrinsic linearity. To validate the prostate cancer predictive performance of ETzD, a trans-rectal ultrasonography (TRUS)-guided biopsy cohort of 3,440 patients was analyzed. Performance to predict unfavorable pathologic outcome among prostate cancer patients was also evaluated with a radical prostatectomy cohort of 2,783 patients. For performance analysis, predictive performances were evaluated by receiver operating curve (ROC) analysis and compared with PSA, PSAD and transitional zone PSAD (TzPSAD).

Results

For predictability of positive malignancy, area under the curve (AUC) of ETzD was 0.848 (95% CI; 0.831~0.865), which was better than PSA, PSAD or TzPSAD. For performance to predict an unfavorable surgical outcome among prostate cancer patients, the AUC was 0.736 (95% CI; 0.705~0.768), which was better than PSA and comparable to PSAD or TzPSAD.

Interpretation of results

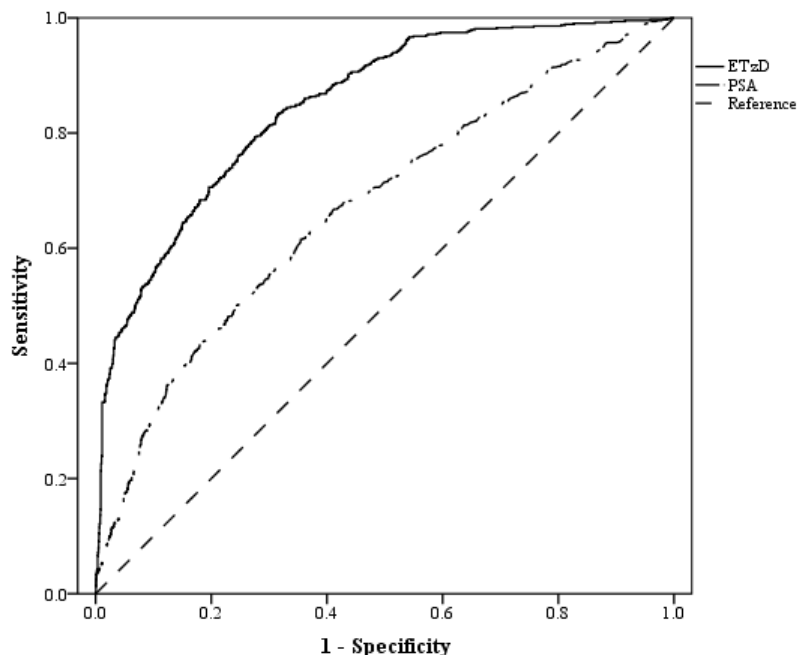
ETzD demonstrated better predictability compared with conventional PSA, PSAD and TzPSAD

Concluding message

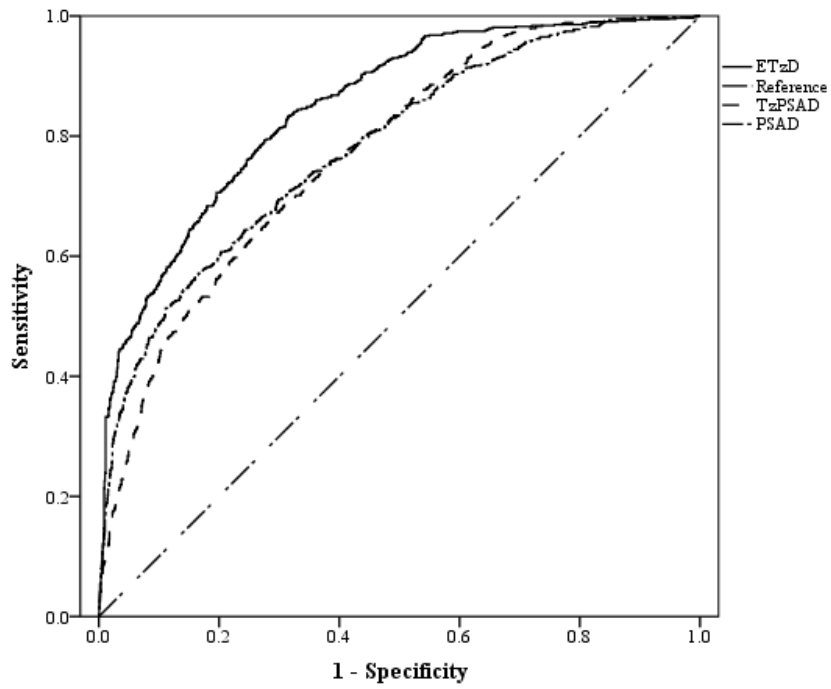
We verified the utility of ETzD as a universal parameter that exhibits superior performance and may potentially be substituted for conventional parameters such as PSA and PSAD.

Figure. ROC curves for Extra-Transitional zone Density (ETzD), PSA, PSA density (PSAD), and transitional zone PSAD (TzPSAD) for prostate cancer detection of TRUS-guided 12-core prostate biopsies

a)



b)



PSA; prostate specific antigen, PSAD; PSA Density, TzPSAD; transitional zone PSAD, ETzD; Extra-Transitional zone Density

Disclosures

Funding: none **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** SMC Helsinki: Yes **Informed Consent:** Yes