Predicting the risk of non-organ-confined prostate cancer when perineural invasion is found on biopsy.

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Abstract

OBJECTIVE: To more precisely define the risk of non-organ-confined (non-OC) prostate cancer among men with perineural invasion (PNI) identified on prostate biopsy.

MATERIALS AND METHODS: The Johns Hopkins radical prostatectomy database was queried for men with PNI reported on prostate biopsy. Patients with and without non-OC disease were compared for differences in preoperative clinical and pathologic characteristics, including three biopsy-based measures of tumor volume (number of cores with cancer, percentage of cores with cancer, and maximum percent core involvement with cancer). After evaluating the different preoperative variables in univariate analyses, a multivariable logistic regression model was generated, and bootstrap estimates of the risk of non-OC disease were calculated.

RESULTS: In total, 556 patients with PNI were analyzed, 279 (50.2%) of whom were found to have non-OC prostate cancer. In univariate analyses, preoperative prostate-specific antigen, clinical T stage, biopsy Gleason sum, and the three biopsy-based measures of tumor volume were significantly associated with non-OC disease. Of the three measures of tumor volume, the best fit to the data and highest degree of model discrimination were obtained using maximum percent core involvement with cancer. Incorporating this variable, preoperative prostate-specific antigen, clinical T stage, and biopsy Gleason sum into a multivariable model, the estimated risk of non-OC disease was found to range from 13.8% to 94.4% (bootstrap corrected c-index = 0.735).

CONCLUSION: Men with PNI on prostate biopsy are at a wide range of risk for non-OC disease. Preoperative estimation of this risk is improved by considering readily available biopsy estimates of tumor volume.

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