A multivariable analysis of clinical factors predicting for pathological features associated with local failure after radical prostatectomy for prostate cancer.


Abstract

PURPOSE: A multivariate analysis is used to determine the predictive value of pretreatment clinical indicators on pathologic features associated with local failure after radical prostatectomy in patients with prostate cancer.

METHODS AND MATERIALS: A retrospective review of the pathologic findings of 235 patients with adenocarcinoma of the prostate treated between 1990 and 1993 with a radical retropubic prostatectomy was performed. The preoperative clinical data including the serum prostate specific antigen, clinical stage, Gleason sum, and endorectal magnetic resonance scan findings are used to identify patients prior to definitive treatment who would be at high risk for having pathologic features associated with local failure at radical prostatectomy. Outcome prediction curves are constructed from a logistic regression multivariate analysis displaying the probability of pathologic involvement of the seminal vesicle, extracapsular disease, or positive surgical margins as a function of the preoperative prostate specific antigen and Gleason sum for the cases when the endorectal magnetic resonance scan is positive, negative, or not included in the multivariate analysis.

RESULTS: Factors identified on multivariate analysis as significant predictors of seminal vesicle invasion include endorectal magnetic resonance scan findings (p < 0.0001), and preoperative prostate specific antigen (p = 0.017). Endorectal magnetic resonance scan findings (p = 0.0016), preoperative prostate specific antigen (p = 0.0002), and Gleason sum (p < 0.0001) were significant predictors of extracapsular extension and preoperative prostate specific antigen (p < 0.0001) and Gleason sum (p = 0.03) were significant predictors of disease extending to the margins of resection. Clinical stage was not a significant predictor (p > 0.05) of pathologic features associated with local failure on multivariate analysis. As a single modality, endorectal surface coil magnetic resonance imaging was accurate 93%, 69%, and 72% of the time for predicting seminal vesicle invasion, transcapsular disease, and final pathologic stage, respectively. Failure to recognize microscopic penetration of the capsule found at the time of pathologic evaluation in a prostate gland with a grossly intact capsule accounts for the majority (70%) of the staging inaccuracies.

CONCLUSIONS: The use of the endorectal surface coil magnetic resonance scan findings in conjunction with both the serum prostate specific antigen and Gleason sum improves the clinical accuracy of predicting those patients at high risk for clinically unsuspected extraprostatic disease. In particular, for the subgroup of patients with moderately elevated prostate specific antigen (> 10-20 ng/mL) and intermediate grade clinically organ confined prostate cancer [Gleason sum: 5-7] where the specificity of these tests to predict for occult extraprostatic disease is suboptimal, the additional information obtained from the endorectal coil magnetic resonance scan allows the physician to
definitively subgroup these patients into low and high risk for seminal vesicle invasion or transcapsular disease.

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