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The impact of prostate cancer zonal origin on pathological parameters at radical prostatectomy and subsequent biochemical failure

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Purpose: To assess the impact of prostatic zone tumour origin on the pathological prognostic features and subsequent biochemical outcomes after radical prostatectomy.

Materials and Methods: A total of 7051 patients undergoing radical prostatectomy between September 1998 and December 2016 in Western Australia were divided into high-grade (Gleason sum 4+3, 8 and ≥ 9 , ISUP groups 3, 4 and 5) and low-grade (Gleason sum ≤ 6 and 3+4, ISUP groups 1 and 2) groups. The t-test and Pearson Chi-square test were used to evaluate differences between the transition zone and peripheral/central zone cancer. The Kaplan-Meier method with the log-rank test was used to demonstrate differences in BCR-free survival at 5 years in patients with high-grade disease. Univariate and multivariable Cox proportional hazard regression analyses were performed. Model calibration was provided by the internal validation method.

Results: High-grade transition zone cancer was associated with significantly increased prostate-specific antigen, tumour volume and incidence of positive surgical margins, but lower occurrence of intraductal carcinoma, extraprostatic spread, seminal vesicle invasion, lymph node involvement and biochemical failure after radical prostatectomy. Patients with low-grade prostate cancer have excellent biochemical recurrence-free survival regardless of tumour origin. The high-grade multivariable model had a c-index of 0.78 and improved predictive accuracy, particularly for high-grade transition zone disease.

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