OBJECTIVE: To assess the influence of tumour zonality on biochemical recurrence (BCR) after radical prostatectomy (RP) with a histologically confirmed positive surgical margin (PSM).

PATIENTS AND METHODS: Data from 382 patients that underwent RP with either transition zone (TZ) or peripheral zone (PZ) tumours involving PSMs between 1998 and 2010 were retrieved from the Abbott West Australian Prostatectomy Database. Statistical analysis was used to evaluate the relationship of various tumour clinicopathological parameters, e.g. zonal origin of tumour, tumour volume, Gleason score, and stage to the development of BCR

RESULTS: There were 51 TZ and 331 PZ tumours with PSMs identified. The TZ tumours compared with PZ tumours were larger (median 5.67 vs 3.64 mL, P < 0.001), more frequently lower grade (Gleason score 6 33% vs 5%, P < 0.01), organ confined (51% vs 35.6%, P = 0.073), and preferentially involved the bladder neck (49% vs 6%, P < 0.001). Tumour zonality was not associated with BCR for the entire cohort. TZ and PZ tumours had similar 5-year BCR-free survival rates (58% vs 63%, P = 0.691) and comparable time to development of BCR (14.4 vs 19.2 months, P = 0.346). On univariate analysis, preoperative PSA level, PSM at the bladder neck, tumour volume, Gleason score (P < 0.001) and tumour stage were independent predictors of BCR for the entire cohort. On multivariate analysis tumour volume and Gleason score retained significance as independent predictors of BCR. Tumour zonality was not directly associated with BCR. Of the patients who received adjuvant therapy, the incidence of BCR was similar for TZ and PZ tumours (58% vs 67%, P = 0.077), although TZ tumours failed significantly earlier (mean 4.4 vs 16.4 months, P = 0.037).

CONCLUSIONS: PSA recurrence in patients with histologically confirmed PSMs after RP is independent of the zonal location of the index tumour. However, tumour zonal origin may have an indirect influence on PSA relapse, as TZ tumours tend to be of large volume and more likely involve the bladder neck margin, both risk factors for BCR. Bladder neck margin involvement is associated with higher rates of BCR than other sites of PSMs. The preoperative identification of TZ tumours might aid surgical planning with appropriate alteration of RP technique to incorporate wider surgical margins at the bladder neck. Adjuvant radiotherapy appears to be associated with adverse outcome for TZ tumours, a novel finding which warrants further investigation.

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KEYWORDS: bladder neck; margin; prostate cancer; prostatectomy; recurrence; transition zone

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