Clinical utility of total length Gleason pattern 4 on biopsy in men with Grade Group 2 prostate cancer.


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PURPOSE: The ideal methodology for quantifying secondary Gleason pattern 4 (GP4) in men with Grade group (GrdGrp) 2/Gleason score (GS) 3+4=7 on biopsy remains unknown. We compared various methods of GP4 quantification and evaluated their association with adverse pathology at radical prostatectomy (RP).

MATERIALS AND METHODS: 457 men with GrdGrp 2 prostate cancer on biopsy who subsequently underwent RP at our institution. Only patients with ≥ 12 cores reviewed were included. Three methods for quantifying GP4 were evaluated: maximum %GP4 in any single core, overall %GP4 (mm of GP4/total mm of cancer) and total length GP4 (mm) across all cores. Adverse pathology at RP was defined as GS ≥4+3=7 (≥ GrdGrp 3), any extraprostatic extension/seminal vesical invasion/lymph node metastasis. A training/test set approach and multivariable logistic regression were used to determine whether GP4 quantification methods could aid in predicting adverse pathology.

RESULTS: On multivariable analysis, all GP4 quantification methods were significantly associated with an increased risk of adverse pathology (p-values <0.0001) and increased AUC beyond the base model; largest increase was 0.044 with total length GP4 (AUC 0.728, 95%CI: 0.663-0.793). Decision curve analysis demonstrated increases in clinical net benefit with addition of GP4 quantification to the base model; total length GP4 clearly demonstrated the largest net benefit.

CONCLUSIONS: Our findings support inclusion of Gleason pattern 4 quantification in pathology reports and risk prediction models for patients with GrdGrp 2/GS 3+4=7 prostate cancer. Total length of GP4 across all cores provides the strongest benefit for prediction of adverse pathology.

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