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## Does Tumour:Stroma Ratio Have Prognostic Significance In Endometrial Adenocarcinoma?

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### Introduction

Tumour-associated stroma is thought to have an important role in malignant progression. High stromal content of tumour mass has been found to predict poor outcome in a variety of epithelial tumours. This study aimed to establish if the tumour: stroma ratio (TSR) is a prognostic indicator in endometrial adenocarcinoma and to investigate its relationship with other clinicopathological factors.

### Methods

A series of 400 endometrial adenocarcinoma cases were analysed using systematic spot-counting software on digitized hysterectomy specimens and TSR measured. Inter-observer agreement for the systematic scores was determined using Cohen's Kappa statistic. Prognostic significance of TSR on overall survival (OS) and disease-free survival (DFS) was determined using Cox Proportional Hazards analysis and Kaplan-Meier curves generated. Associations of TSR with established prognostic factors was established by non-parametric analyses and corrected with the Holm-Bonferroni method. The systematic scoring system was assessed for inter-observer variation using Kappa scores.

### Results

Kappa scores of 0.94 indicated an extremely high level of inter-observer agreement using the systematic scoring method. As a continuous variable, TSR predicted worse OS ( $P = 0.034$ ) in univariable analysis. TSR high (stroma-low) tumours, using the optimal cut-off of 1.3, were associated with significantly worse OS (HR 2.507; 95%CI 1.22-5.14;  $P = 0.012$ ) and DFS (HR 2.18; 95%CI 1.15-4.160;  $P = 0.017$ ) in univariable analysis. However in multivariable analysis TSR did not have independent prognostic significance. TSR was found to have a highly significant positive association with tumour grade ( $P < 0.001$ ) and lymphovascular space invasion (LVSI) ( $P < 0.001$ ), both of which were confirmed to be of independent prognostic value in our study population.

### Conclusion

This study suggests that TSR has limited value as an independent prognostic indicator in endometrial adenocarcinoma. However the association of TSR high (stroma-low) ratios with high tumour grade and the presence of LVSI indicates that the adverse prognostic influence of high stromal content is not universal in epithelial tumours.