

EP05.09: Tumor Volume Outperforms Visceral Pleural Invasion as an Independent Prognostic Factor in Resected Lung Adenocarcinoma

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INTRODUCTION

- Recent studies question whether visceral pleural invasion (VPI)–based T-stage upstaging reliably predicts prognosis, and evidence suggests that tumor volume (TV) may be a better prognostic measure than maximum diameter.
- Although the prognostic impact of solid and micropapillary patterns is well documented, their combined effect remains unclear.
- We evaluated the prognostic significance of TV, VPI, and histologic patterns in resected lung adenocarcinoma.

METHODS

- Design:** Retrospective single-center analysis of 501 patients with resected lung adenocarcinoma (2020–2022).
- Variables:** age, sex, TV (from three-dimensional histopathologic measurements), VPI, histologic subtype, spread through air spaces (STAS), resection margin status (R), and pathologic stage.
- Endpoint:** overall survival (OS).
- Univariable:** Kaplan–Meier with log-rank test; a two-stage testing procedure was applied where the proportional hazards assumption was violated.
- Multivariable:** Cox proportional hazards regression; final model selected by AIC. Categorical variables compared by chi-square test.

DISCUSSION AND CONCLUSION

Actionable Take Away Message

- TV and high-grade histologic patterns, together with R1, male sex, and age, are adverse independent prognostic factors
- After adjustment for TV and margin status, VPI is not prognostically significant
- Solid + micropapillary patterns does not increase risk beyond each pattern alone

Future Direction for Research

- TV may better represent the prognostic value currently attributed to VPI in the TNM classification and warrants prospective, multicenter validation as a T-descriptor

REFERENCES & ACKNOWLEDGEMENTS

Here you can find the references list for the E-poster, the full abstract, and the ORCID ID:



Artificial Intelligence (AI) Use Disclaimer

Grammarly was used for language editing (grammar and spelling) only; no AI was used for study design, data analysis, or interpretation.

RESULTS

- Cohort: median age 69 years (range 38–85); 283 women (56%), 218 men (44%). Resections: lobectomy 437 (87%), segmentectomy 59 (12%), pneumonectomy 5 (1%). Stage: IA 210 (42%), IB 206 (41%), II 63 (13%), >II 21 (4%). STAS present in 82 (16%), VPI in 235 (47%), R1 in 19 (4%).
- Univariable OS differences were significant for R1 (median OS 24 months vs not reached; $p < 0.0001$), solid pattern ($p < 0.0001$), micropapillary pattern ($p = 0.009$), and stage ($p = 0.002$).
- In the final multivariable model, independent negative predictors of OS were R1, solid pattern, micropapillary pattern, tumor volume, male sex, and age. VPI was not an independent predictor after adjustment. Co-occurrence of solid and micropapillary patterns showed no synergistic effect (interaction $p = 0.21$).

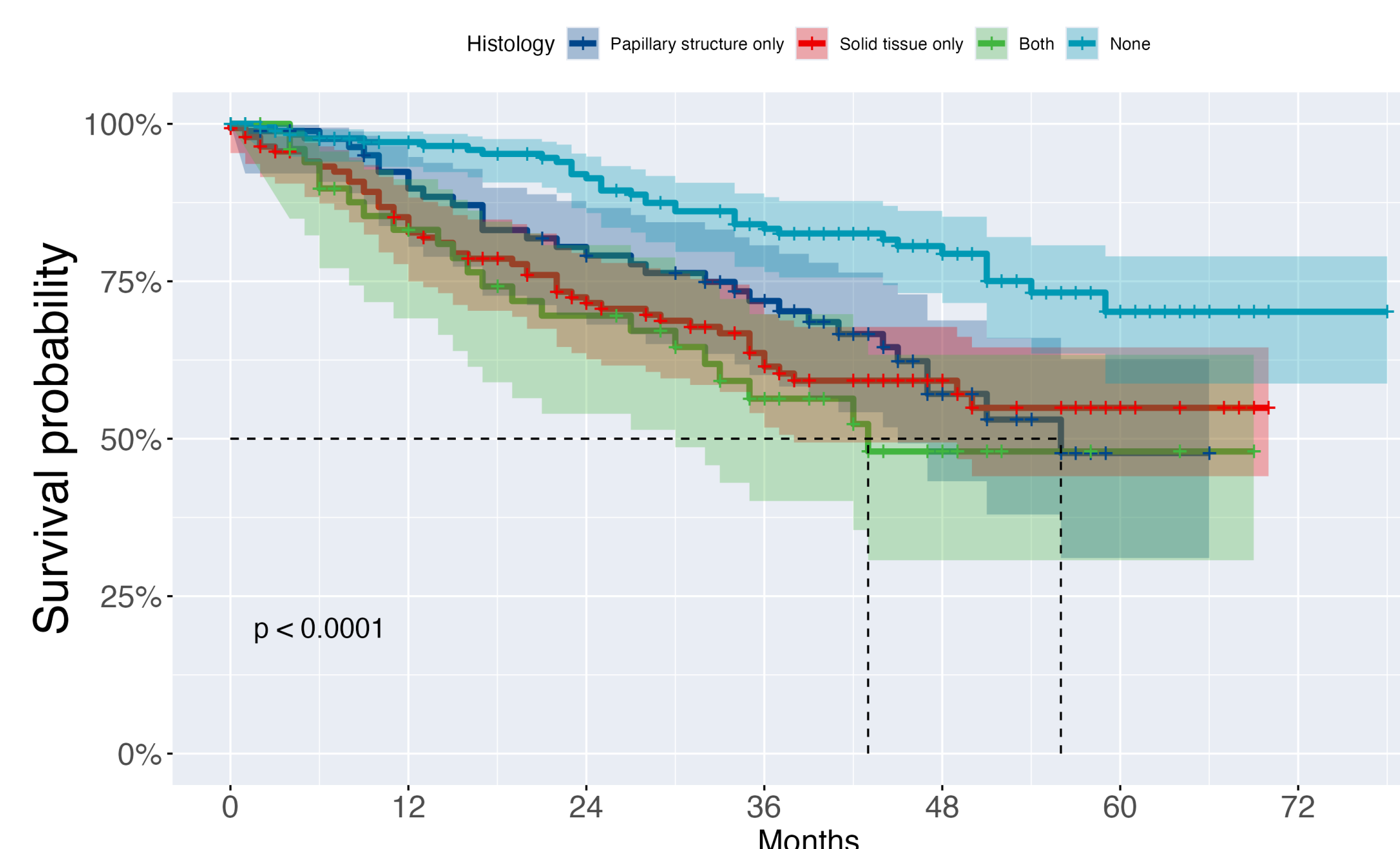


Figure 1. OS by histology: solid and/or micropapillary patterns predict worse survival; co-occurrence adds no risk (log-rank $p < 0.0001$).

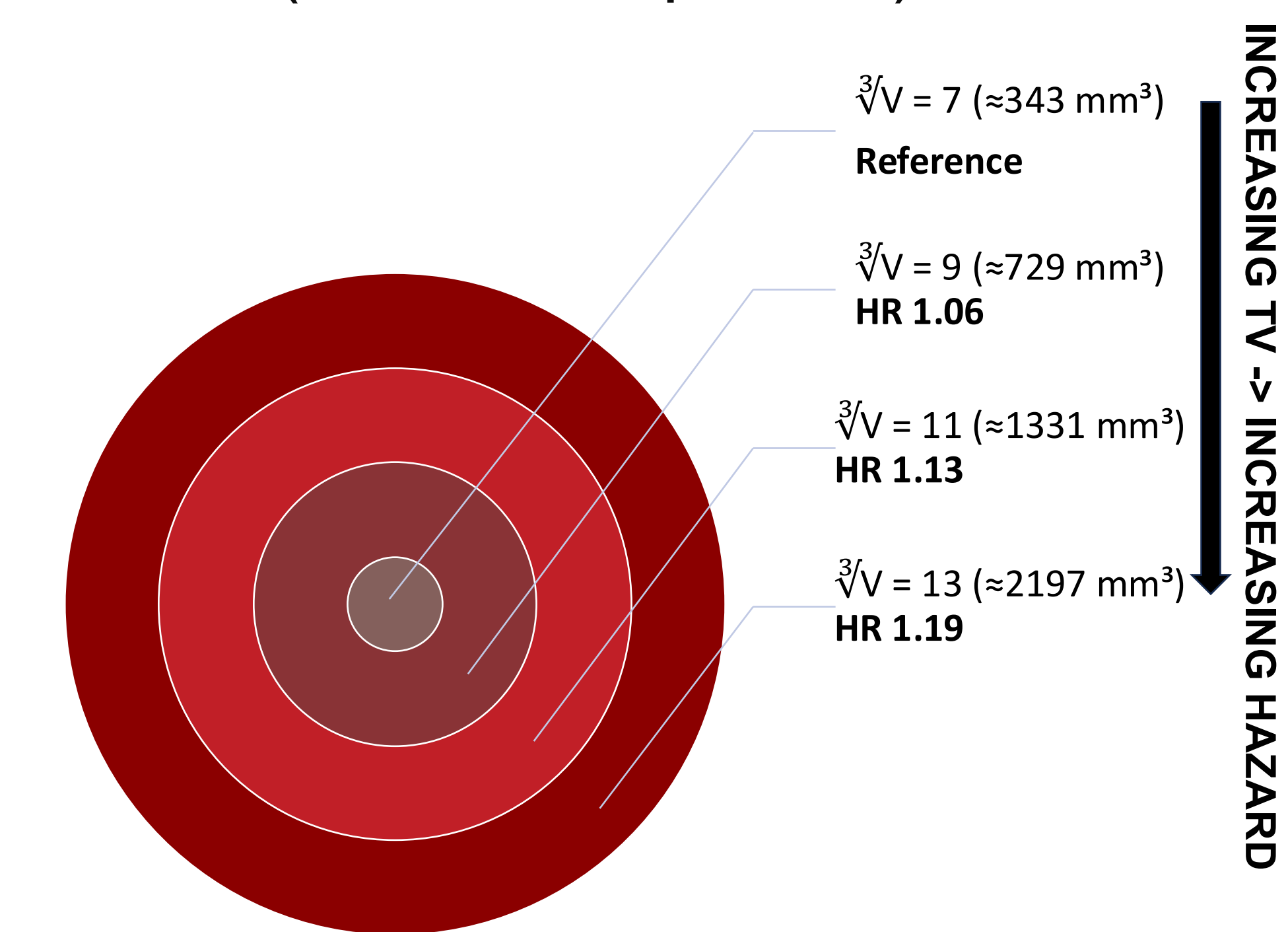


Figure 2. Tumor volume: small per-unit HR, meaningful across sizes

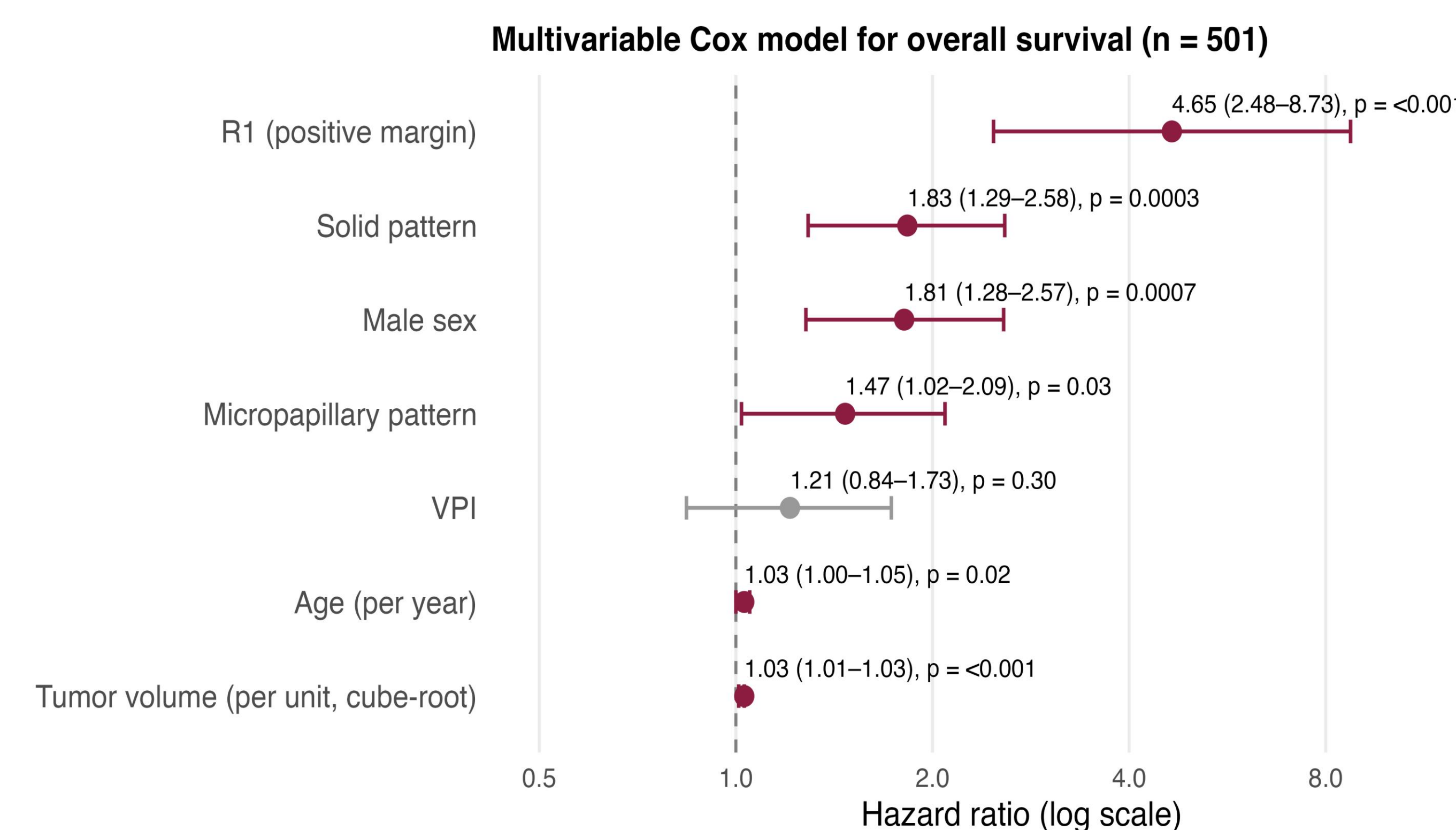


Figure 3. Multivariable Cox model (n=501): R1, solid and micropapillary patterns, tumor volume, sex, and age are independent predictors; VPI is not (HR 1.21, 95% CI 0.84–1.73, $p = 0.30$).