

Histological Risk Classification Predicts Malignancy and Recurrence in Paragangliomas

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Background: Mid-term outcome information in risk stratified patient cohort is needed to inform prognosis in individual patients with paragangliomas (PGL), adjuvant therapy choice and future research. The objective is to define the outcome relevance of a novel risk stratification scheme for PGLs.

Design: A classification scheme for PGLs was devised and specimen were assessed for invasion capacity (infiltrative edges with broad fibrous bands, extra-adrenal extension [recording capsular, microscopic periadrenal and gross periadrenal], capsular and peritumoral vascular invasion [recording thin- and thick-walled blood vessels]), tumorigenic expansion (expansile nodules with diffuse areas, hypercellular homogenous areas, necrosis [recording multifocal and confluent subtypes]) and mitogenic activity (MFC/10HPF, presence of atypical mitotic figures). Patients were prospectively stratified as low risk or high risk (presence of at least one feature of invasive capacity and two features of tumorigenic expansion). Patients underwent systematic treatment and follow up for their PGLs in a tertiary referral center.

Results: The multilevel analysis based on 78 patients identified statistically significant differences in clinical and biochemical presentation between low risk and high risk patients for gender ($p < 0.05$), noradrenalin (4.6 ± 8.5 vs 11.6 ± 16.9), dopamine (0.6 ± 0.3 vs 1.7 ± 2.4), size of lesion (49.8 ± 19.5 vs 89.2 ± 45.8) and malignancy, 0% vs 21.6% ($p < 0.01$), treatment modalities for MIBG therapy, 0% vs 40.5% ($p < .0001$), MVR, 0% vs 23.3% ($p < .001$) and lymph node dissection, 13.5% vs 40.5% ($p < 0.01$) and distant metastases, 0% vs 21.6% ($p < 0.01$). Disease free survival was significantly lower in HR patients 0% vs 78.4% ($p = 0.004$). Histological risk stratification predicts DFS with AUC of 0.8 (95% CI: 0.69-0.90; $p < 0.01$). 7/37 patients with HR had a synchronous diagnosis of malignancy based on other criteria and 4 patients suffered local recurrence.

Conclusions: Stratification as low risk excluded a synchronous diagnosis of malignancy and disease recurrence of a follow-up interval of 1-75 months (median 12 months). A high-risk status is associated with high risk of malignancy and disease recurrence.

Category: Endocrine Pathology